

**“Resource Sharing between Centre and States and Allocation across States:
Some Issues in Balancing Equity and Efficiency”**



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Chapter 1: Rationale and Review of devolution by Finance Commissions

1.1. Introduction: The Rationale for Devolution of Resources in India

The constitution of India provides for decentralization of revenue and expenditure at two levels of the Federation, the Union and the States. It specifies the revenue raising power and areas of expenditure broadly on considerations of efficiency based on comparative advantage of the governments at the two levels. An imbalance arises in this process since the Union (Central) government is assigned most of revenue raising power while the State governments are expected to carry out most of the development and welfare oriented expenditure. Hence, the constitution provides for devolution of part of the union revenue to the states.

Fiscal imbalance at different level of government is a common feature in many federal countries¹, the lower level of governments are generally confronted with inadequate resources for meeting their expenditure needs. In the Indian case, the Centre has the authority² to decide on broad based and buoyant taxes such as income tax, corporation tax and excise duties while the states have the authority on items like sales tax, stamp duties, entertainment tax, and land revenue most of which are not as buoyant. In terms of expenditure decentralization, the central government is entrusted with the responsibilities of provision of nationally important areas like defence, foreign affairs, foreign trade and exchange management, money and banking, cross-state transport and communication. The state governments are given the responsibility of facilitating agriculture and industry, providing social sector services such as health and education, police protection, state roads and infrastructure. The third level local self-governments

¹ See Boadway & Shah. Edited (2007) for detailed discussion about theory and practice of fiscal federalism.

² The Seventh Schedule of the constitution of India spells out the details of the areas of power and responsibilities under Central, State and Concurrent lists.

– municipalities and panchayats³ -provide public utility services such as water supply and sanitation, local roads, electricity etc. In addition, both central and state governments are responsible for provisioning services in the concurrent list. The resultant vertical fiscal gap, which also occurs in India, necessitates intergovernmental revenue transfer. The observed imbalance is not entirely due to revenue instruments and functions assigned in the constitution, but it is partly an outcome of fiscal choices exercised by different levels of government in practice.

Revenue decentralization results in the sharing of revenue raising powers and the use of instruments, especially various types of taxes, by different levels of government. The Indian government has been undertaking tax reforms on continuous basis aimed at increasing the tax base of both direct and indirect taxes, reduction in tax evasion and a resultant increase in the revenues of both state and central governments. The Central government has greater revenue raising powers in India, keeping in view considerations such as administrative efficiency in collecting taxes with a nationwide base. However, expenditure decentralization gives freedom to states to spend according to state specific needs given the huge diversity in preferences of citizens in different states and in levels of their economic and social development.

The possibility of fiscal imbalance is well recognised in the Indian Constitution which provides for an institutional mechanism to tackle the imbalance in the form of the Finance Commission (FC) which makes recommendations on the magnitude of transfer of resources from the Centre to the states for a period of 5 years. The Constitution stipulates the primary terms of reference (ToR) of the FCs: (a) distribution of net proceeds of Union divisible taxes between Union and States and among states *inter-se*, (article 280) (b) grants in aid from Union revenue to be given to states. A third ToR, has been added later after the 73rd and 74th Constitutional Amendments in 1992 which relates to recommendation of measures needed to augment the consolidated funds of States to supplement resources for rural and urban local governments in the States based on recommendations of the State Finance Commissions. Besides, the President may include additional ToR for the FC on any other matter in the interest of sound finance of the

³ The third level of local self-government bodies receive grants from their respective state governments. The 13th and 14th Finance Commissions have provision for earmarked grants for the local bodies apart from tax devolution to states.

governments. These additional matters are normally context specific and vary from one FC to another. While the tax devolution and grants recommended by FC forms bulk of Central transfers to states, it may also be noted that transfers from Union to States are not limited to FC recommendations. Other channels include specific purpose transfers by Central Ministries and grants transferred earlier by the erstwhile Planning Commission.

The FC has been recommending transfers under two heads for a period of 5 years. First, it recommends tax devolutions which are general purpose transfer without being earmarked for expenditure in any specific area and are specified as a percentage of sharable tax revenue. Second, it states the principles governing grants in aid and recommends amount of specific purpose grants. The Centre has generally accepted the recommendations of the FCs⁴.

It may be noted that the FC interacts with Central Ministries, state governments, industrial and business bodies, academicians and several other stakeholders during the course of its deliberations. Individual states and several central ministries provide their opinion and suggestions to the Finance Commission. In making transfers, the FCs consider issues related to vertical equity (deciding about the share of all states in the revenue collected by centre) and horizontal equity (allocation among states their share of central revenue). The horizontal transfers, distribution of funds meant for states, depends on criteria adopted by specific FCs and has varied over time. These have been discussed in more details in later sections of the report.

This study relates to some issues in resource sharing between Centre and states and allocation across states. The specific Terms of Reference of the study are:

1. Review of the approach and recommendations of the various Finance Commissions with respect to vertical and horizontal devolution of resources
2. Describe the trends and changing patterns in vertical devolution by focusing on the revenue and expenditure of the Union and the States
3. Summarize the trends and patterns in horizontal fiscal devolutions across states along with states' own effort to raise resources and maintain fiscal discipline

⁴ One exception is noted in the following section.

4. Analysis of major factors affecting the horizontal and vertical devolution trends
5. Understand the current status on key fiscal parameters related to the resource allocation between Centre and states and further across states
6. Highlight the major emerging concerns in resource devolution with specific reference to merits and demerits of criteria used for vertical and horizontal balances

In keeping with the overall objective of the report to examine alternative approaches to understand vertical fiscal imbalances and degree of equalization in the light of current status and recent trends the report is organised as follows. The rest of Chapter 1 provides a review of the recommendations by various FCs, especially the last four with respect to vertical and horizontal devolution in India. Chapters 2 and 3 discuss trends and changing patterns in vertical devolution and horizontal devolution respectively. Chapter 4 provides an analysis of factors affecting the vertical and horizontal devolution. Chapter 5 describes the current status on key fiscal parameters related to resource allocation. Chapter 6 relates to some emerging concerns about vertical and horizontal devolution. Chapter 7 provides summary and recommendations.

Besides analysis of issues and trends in revenue and expenditure of centre and states, we highlight some specific focus points of investigation in this study as follows:

- 1) Population stabilization: The recommendations of the FCs for horizontal distribution across states generally use the size of the population in deciding the magnitude of transfers to states. The ToR of the 15th FC mandates the Commission to use 2011 population for this purpose. At the same time, the ToR 4(ii) refers to a measurable performance based incentives for States in respect of efforts and progress made in moving towards replacement rate of population growth. In Chapter 6, we propose an indicator of population stabilisation to devise a performance based incentive structure for the states. Such indicators could either be used as a component of considerations of horizontal equity to offset any disadvantage faced by states which have moved towards population stabilization or could be part of the transfer through a grant mechanism.
- 2) Environment: The 14 FC brought in dense forest cover as a criteria determining horizontal devolution. A re-look is taken at the formulation, in keeping with the TOR of the 15 FC. The TOR mentions in 3(ii) resource demands for climate change, among other

factors and in ToR 4(iii), sustainable development goals. In this context, data based analysis is done to examine the implications for states under varying scenarios, both for inclusion in the formula or as a conditional grant. There is a need to expand the coverage beyond dense cover in order to address the intent to compensate for fiscal disability while performance based indicators can incentivize states and contribute towards the international environmental commitments

- 3) Inequality: The rising inter-state inequality in recent decades might require some consideration of non-linearity in the income distance formula to give more weight to states at the bottom end of the income scale. One way of doing it is to introduce an inequality aversion parameter. We show alternative weights for horizontal devolution based on linear and non-linear considerations.
- 4) Social sector expenditure: Another questions we examine is whether social sector expenditure is responsive to increase in both NSDP and general purpose devolution. Our findings show that specific central transfers may not be required to meet the social sector expenditures. Specific transfers can be designed for meeting specific national objectives other than those covered under existing social sector expenditure or where there are major inter-state implications.

1.2: Review of the approach and recommendations of the various Finance Commissions with respect to vertical and horizontal devolution of resources (TOR I)

1.2.1 Vertical Equity and Approaches of Recent Finances Commissions of India

As stated above, origin of vertical imbalance lies in assignment of revenue generating powers and functional responsibilities to Union and States on the basis of comparative advantage. The Union government generally collects 60-68% of combined revenue receipts due to buoyant and broad based taxes assigned to it and the states together collect the balance. The revenue expenditure of the states, on the other hand, has been in the range 50-60% of the combined revenue expenditure. The approaches followed by various FCs to bridge the above imbalance have been evolutionary drawing upon those of the previous ones.

Different FCs have approached the issue of providing vertical balance taking into considerations various factors that include assessment of fiscal balances of Centre and States, merits of devolution and transfer, possible laxity on gap filling approach, types of expenditure, constitutional amendments carried out by the Parliament, and the overall need to maintain stability in the fiscal system. We discuss below under a few heads how these issues have been approached by the FCs, particularly the recent ones.

Assessment of Need

The 1st FC set the tone of general procedure of seeking information and views of Centre and the states, industry bodies, academics and other stakeholders and this procedure has been followed by successive commissions. It assessed the needs of the states and Centre's capacity to accommodate assistance even as it meets its own need. In this process, the Commission's assessment regarding priority for expenditure need of the Centre and States finally gets reflected in its recommendations. While states needed more resources for meeting their expanded responsibilities for welfare and development of the citizens, the Centre was responsible for services important at the national level. Thus, ability of the Centre to assist was an important factor to be considered.

The 6th FC (award period 1976-79) observation that “when the emphasis is on social justice, there is no escape from the realignment of resources in favour of the states because services and programmes which are at the core of a more equitable social order come within the purview of the states in the Constitution.

The 14 FC stated that two main issues to assessing the vertical imbalance were “a realistic estimation of revenue accruing solely to the Union as well as its expenditure needs and the resources required to meet its obligations under the Constitution” and “a realistic assessment of the revenue capacities of the States and the expenditures required to meet obligations mandated under the Constitution.” It mentioned that the States had argued that “functional overlap has led to an increase in the Union Government’s expenditure and a concomitant reduction in the revenues available for vertical devolution.”

Given that the need for vertical transfers arise from the asymmetric assignment of revenue collection and expenditure responsibility, Finance Commissions have used their own normative assessment of vertical imbalance. Exact quantification of the imbalance is not only difficult, there has been no attempt to do so. In the final analysis, magnitude of vertical imbalance depends on subjective judgement of the Commission and the feedback it receives from the stakeholders. Nevertheless, successive commissions have attempted to strike a balance between the demands of Centre and States with a great degree of success

Tax Effort and Buoyancy

The 3rd FC noted increasing dependence of states on Centre and laxity in raising resources on the belief that gaps will be filled by the Centre. The 9th FC advocated for phasing out of revenue deficit and tried to promote fiscal responsibility for both Centre and States. In this context, we may note the view of Reddy and Reddy (2019) who state that while norms proposed by the FCs are not so difficult to impose on the States, there is no agency to impose such norms on the Centre.

Several FCs have noted the differential tax buoyancy of the Centre and the states. This was an important consideration for the 12th FC which argued for increasing the share of states without directly stating what portion of the change may be attributed to this factor. Srivastava (2010)

estimated that the Central tax buoyancy was 1.559 compared to 1.212 for combined own taxes of the states during the 2004-05 to 2008-09. He justified a 1.5 percentage point increase in the share of the states by the 12th FC on the basis of the product of GDP growth rate and difference in central tax buoyancy over that of states.

The 13th FC felt that “vertical devolution must be informed by the revenue-raising capacity of the Centre and states as well as emerging pressures on their expenditure commitments.” The 13th FC also observed that the “buoyancy of central taxes at 1.49 was higher than states (1.18) during the period 2000-08 and that there are reasons to believe that the Centre’s revenue buoyancy will continue to remain higher than that of States”. In addition, the 13th FC noted that “the share of states after transfers will be constant only if their share in central taxes is increased by a margin by which the buoyancy of central taxes exceeds the buoyancy of combined tax revenue.” The 13th FC recommended 32% as the share of tax devolution as against 30.5% by 12th FC (Table 1.1).

Plan and Non-Plan Expenditure

There was also a debate on the authority to decide the quantum of plan expenditure. The 3rd FC made recommendation by majority opinion on part the plan expenditure of states leaving the balance to Planning Commission. The Government of India rejected the majority view⁵ and accepted the minority view of the Member-Secretary that entire plan expenditure should be assessed by the Planning Commission. Thereafter, the ToR of 4th to 13th (except the 11th) FCs was restricted to non-plan expenditure requirement only. The 14th FC assessed the total revenue expenditure need due to abolition of plan and non-plan expenditure categorization.

Kelkar (2019) states that Finance Commission was given the task of allocating resources for dealing with provision of different levels per capita consumption of basic public goods and services across states, while the erstwhile Planning Commission was supposed to allocate resources for meeting physical and social infrastructure crucial for growth. It was recognized at times that resource availability for basic public goods and economic growth was interlinked. For

⁵ This is one exception in recommendations of the FCs that has not been accepted by the government.

instance, 10th FC ToR included generation of surplus on revenue account for capital investment. But, FCs generally confined themselves to revenue resources and revenue expenditure.

Devolution and Grants

Devolution or general purpose transfer are “given to *enable* states to provide comparable levels of public services at comparable tax effort and specific purpose transfers are given to *ensure* a minimum standard of public services” (Rao, 2019).

The 1st FC was of the view that tax devolution should be the primary means of transfer and that grants in aid should be only residual form of assistance for considerations not reflected in the devolution. While the above approach has generally been adopted by other FCs, there have also been several important differences. The 2nd FC, for example, observed that grants in aid should be general and unconditional, but several other commissions have not viewed grants as unconditional.

The 12th FC said that “if the share of states is increased, the redistributive content in the *inter se* distribution will have to be increased significantly by altering the weights among the distribution criteria so as to be consistent with the equalization objective.” It agreed that grants were a better mechanism for this purpose and hence mentioned that they had used grants to a larger extent as an instrument for these transfers. Srivastava (2010) too states: “The higher the vertical share of the states, the lower the weight to the equalizing component of tax revenue sharing, as with distance formula for horizontal distribution.” This implies that horizontal distribution is not independent of the vertical distribution.

The 14th FC, like its predecessors, was also of the view that tax devolution should be the primary route of transfer of resources to States “since it is formula based and hence conducive to sound fiscal federalism.” Additionally, the 14th FC stated that where the formula-based transfers did not meet the States’ needs, grants-in-aids must be given on an assured basis and in a fair manner.

The 14th FC also believed that a compositional shift in transfers from grants to tax devolution was desirable for two reasons: (a) it did not impose an additional fiscal burden on the Union

Government, and (b) an increase in tax devolution would enhance the share of unconditional transfers to the States.

Constitutional Amendments

The approaches of FCs have also been influenced by amendments regarding sharable pool of taxes. The first ten FCs based their recommendations on the mandatory provision of Article 270 regarding sharing net proceeds of income tax and the enabling provision of Article 272 regarding permissible sharing of Union excise duties, 'if Parliament by law so provided'. The first FC recommended 40% of Union excise duties collected from 3 commodities of common and widespread consumption (tobacco, matches and vegetable products). Subsequent three FCs found states resources to be inadequate to meet expenditures and expanded the list of items of Union excise duties for sharable revenue. The 4th FC felt the need to share all Union excise duties with the states. The proportions of revenue from income tax and Union excise duties to be shared varied from time to time. For example, the 1st FC recommended 55% of income tax to be shared and the percentage rose to 85% by the 7th FC (see, Table 1.1). Finally, 10th FC recommended that states should have the benefit of buoyancy of all Central taxes and greater certainty in resource flow. Consequently, 80th amendment was introduced in the constitution in 2000 to include Central taxes on all goods and services, except cesses and surcharges, in the divisible pool.

States, however, have been demanding to include cesses and surcharges in the divisible pool. The 14th FC also noted that it was not appropriate to amend the constitution to include the non-divisible pool of resources (cesses and surcharges) given the experience so far and said the alternate option to addressing this concern of the states of including cesses and surcharges as part of the devolution was to compensate States by increasing the share of the divisible pool.

Continuity with Change

FCs attempt to make an overall fiscal assessment of the Union and States examining trends in revenues and expenditure through a series of interactions. While important changes on scope and

design as noted above have occurred over time, there have also been medium run stability on the quantum of transfers relative to total revenue or size of the economy. The 11th FC, for example, noted that the share of States in the net proceeds of all Union Taxes and duties fluctuated between 26.3% and 31.59% and it recommended that States get 29.5% of the gross revenue.

The 14th FC stated that they considered four considerations and then decided to increase the share of tax devolution to 42% which they believed would “serve the twin objectives of increasing the flow of unconditional transfers to the States and yet leave appropriate fiscal space for the Union to carry out specific-purpose transfers to the States.” The considerations were: (i) States not being entitled to the growing share of cesses and surcharges in the revenues of the Union Government; (ii) the importance of increasing the share of tax devolution in total transfers; (iii) an aggregate view of the revenue expenditure needs of States without plan and non-plan distinction; and (iv) the space available with the Union Government. In view of these considerations, it increased the share of tax devolution to 42% as against 32% recommended by 13th FC. This big jump is, however, not comparable since the ToR of the 14th FC did not distinguish plan and non-plan components of revenue expenditure. The increase on a comparable basis was only 3% from 39% to 42% (Rao, 2017).

Overall, FCs have not attempted to change the prevailing shares substantially and have used recommendations of previous 2 or 3 FCs as a benchmark to begin with. The changes brought in by a commission over its predecessors may well be described as incremental based on considerations of intervening macroeconomic developments and demand of the states and the Centre. Like the 14th FC, some of them have also introduced substantial compositional changes. The broad approach has been to maintain overall stability in share of centre and states in the combined revenue receipt. The 13th FC explicitly stated this as a desirable factor. Yet, as we discuss in the following chapter, the cumulative effect of incremental changes by various commissions do sum up to a substantial shift in favour of the states resulting in doubling of the devolution as a percentage of gross tax revenue of the centre.

Table 1.1 Vertical Distribution: States Share in Divisible Pool of Central taxes

Finance Commission	States Share in the Net Proceeds of		
	Income Tax (%)	Union Excise Duties (%)	All Shareable Union Taxes (%)
FC-1 (1952-57)	55	40	
FC-2(1957-62)	60	25	
FC-3(1962-66)	66.66	20	
FC-4(1966-69)	75	20	
FC-5(1969-74)	75	20	
FC-6(1974-79)	80	20	
FC-7(1979-84)	85	40	
FC-8(1984-89)	85	45	
FC-9-I(1989-90)	85	40	
FC-9-II(1990-95)	85	45	
FC-10(1995-00)	77.5	47.5	
FC-11(2000-05)			29.5
FC-12(2005-10)			30.5
FC-13(2010-15)			32
FC-14(2015-20)			42

Source: Gupta and Sarma (2019)

1.2.2 Horizontal Equity and Approaches of Recent Finance Commissions in India

Population has been the dominant factor in determining horizontal devolution, i.e. share of each state in the total amount to be distributed amongst all states. In a sense, the need of a state for comparable level of welfare oriented government service gets determined by the size of the state's population. The weight assigned to population has, however, varied from one commission to another. Other factors considered by the FCs included backwardness, income, area, infrastructure, contribution to central pool, tax effort, fiscal discipline and so on. A detailed description of the factors considered and weights used by all the FCs is available in Reddy and Reddy (2019). Table 1.2 below gives the criteria and weights for the last four FCs.

Table 1.2: Components of horizontal devolution formula and weights in 11th to 14th FC

	FC 11	FC 12	FC 13	FC 14
Income Distance/Fiscal capacity	62.50%	50%	47.50%	50%
Population-1971	10%	25%	25%	17.50%
Area	7.50%	10%	10%	15%
Index of Infrastructure	7.50%	-	-	-
Tax Effort	5%	7.50%	*	-
Fiscal Discipline	7.50%	7.50%	17.50%	-
Demographic Change (2011 Population)	-	-	-	10%
Forest Cover	-	-	-	7.50%

Source: Authors' compilations from 11th to 14th FC reports

*: Included in fiscal discipline

The 11th FC report states the following in the beginning of its chapter on “Issues and Approach’:
 “A sound system of intergovernmental fiscal transfers constitutes the cornerstone of a strong and stable federal polity. Transfers serve a two-fold purpose: one, to address the vertical imbalance- the inadequacy of revenues of sub-national governments to meet their expenditure liabilities, arising from asymmetrical assignment of functional responsibilities and financial powers among different government levels, and two, to alleviate horizontal imbalances, the disparities in the revenue capacity of the constituent units of the federation- the states and local bodies in our case- in order that all of them may be in a position to provide basic public services to their citizens at a reasonable level. In recognition of the need to redress these imbalances in a fair and orderly fashion, the Indian Constitution provides for devolution of a part of the Centre’s revenue to the States mandatorily.”

An understanding of what horizontal devolution entails can be understood from the 12th FC report which states that “the horizontal aspect of transfers relates to their *inter se* distribution among states.” The 13th FC elucidates the two main considerations for tax devolution: “Recent finance commissions have used equity and efficiency as the two guiding principles while

recommending *inter se* shares of states in tax devolution”. The 11th FC, 12th FC and 14th FC have also considered equity and efficiency as the principles guiding devolution.

The 11th FC mentions that “the principle of horizontal equity is guided by the consideration that, as a result of revenue sharing, the resource deficiencies across States arising out of systemic and identifiable factors are evened out”. The 11th FC observed that since the principle of equity makes up for resource deficiencies, it would tend to create a vested interest in continuing with such deficiencies. Hence, the 11th FC believed and mentioned that the principle of efficiency was intended to neutralize the adverse incentive by rewarding of efforts to improve the resource bases and to deliver services at minimum (efficient) costs.

In terms of decisions regarding balancing of equity with efficiency considerations, the 12th FC specifically expressed the view that although they had tried to balance equity with fiscal efficiency in the construction of the formula, they were of the belief that equity considerations should dominate in any scheme of fiscal transfers trying to implement the principle of equalization.

The principle of equity according to and mentioned in the 13th FC was to “address problems of differences in revenue raising capacity and cost disabilities across states”. The principle of efficiency according to and mentioned in the 13th FC was intended to address the possible risk of moral hazard arising due to assessing capacity on the basis of observed revenue collected. The principle of efficiency according to and mentioned in the 13th FC was to “motivate the states to exploit their resource base and manage their fiscal operations in a cost-effective manner.”

While the 14th FC did not seem to explicitly mention an exact definition for equity and efficiency, it mentioned that “the devolution formula must be defined in such a way that it attempts to mitigate the impact of the differences in fiscal capacity and cost disability among states.”

The objective of horizontal equity according to and mentioned in the 11th FC was to “help states iron out resource deficiencies that arise due to systemic and identifiable factors.” The 13th FC

expressed a more specific intent of the equity component that it should “ensure that all states have the fiscal potential to provide comparable levels of public services to their residents, at reasonably comparable levels of taxation.” The equity component was considered justified for the 13th FC not merely just for ensuring equal treatment of citizens by governments, but also for reasons of economic efficiency so as to minimize fiscally-induced migration. The 13th FC further noted that the equity component by itself does not ensure the achievement of common standards in quality or outcomes in public services and that for common standards to be achieved, the comparable level of tax effort assumed to hold across states must actually prevail in each state and the efficiency in delivery should be considerably uniform.

Both the 11th FC and the 13th FC brought up the issue relating to the design of incentive-based criteria. The 11th FC asked whether the incentive-based criteria should be dynamically related to future achievements or related only to achievements which were already accomplished. The 13th FC mentioned the same issue of choosing between criteria that was forward looking or criteria based on past trends. Although dynamic incentives help modify future behavior according to the 11th FC, it mentioned that if relevant data would become available only over a passage of time, the FC would be unable to determine the actual shares of states. The 13th FC also claimed that forward looking indicators were better, but it noted that the FC would be unable to determine the actual shares of states since it was not a permanent body. The 11th FC stated that “Because of operational difficulties and in the interest of certainty of the relative shares of States in the tax devolution during the period of our recommendation, we do not consider it feasible or desirable to build any incentives that may change from the quantum of devolution for a State from year to year.”

Chapter 2: Trends and Patterns in Vertical Devolution

(TOR 2: Describe the trends and changing patterns in vertical devolution by focusing on the revenue and expenditure of the Union and the States)

2.1 Revenue shares of Centre and States

We begin with a look at the long term trend in tax-GDP ratio in India during 1952-2018⁶. In the early 1950s, the combined tax collection by the Centre and the States was as low as 6% of GDP reflecting very low level of average standard of living prevailing then. As industry and service sectors expanded, the taxes in relation to GDP rose steadily and doubled by mid-1970s. As Figure 2.1 shows the tax-GDP ratio fluctuated in a close interval of 14-15% for 25 long years till 2004-05, and rose slowly thereafter to reach 17.8% in 2014-15 and 18.2% in 2018-19 (RE). It is recognized in several quarters that India's tax-GDP ratio is low in comparison to its peer group⁷ and needs to be raised by 3-4 percentage points to meet increasing demand for public services. The near stagnancy in tax-GDP ratio at a low level for several decades means that the Union and State governments in India have limited fiscal space.

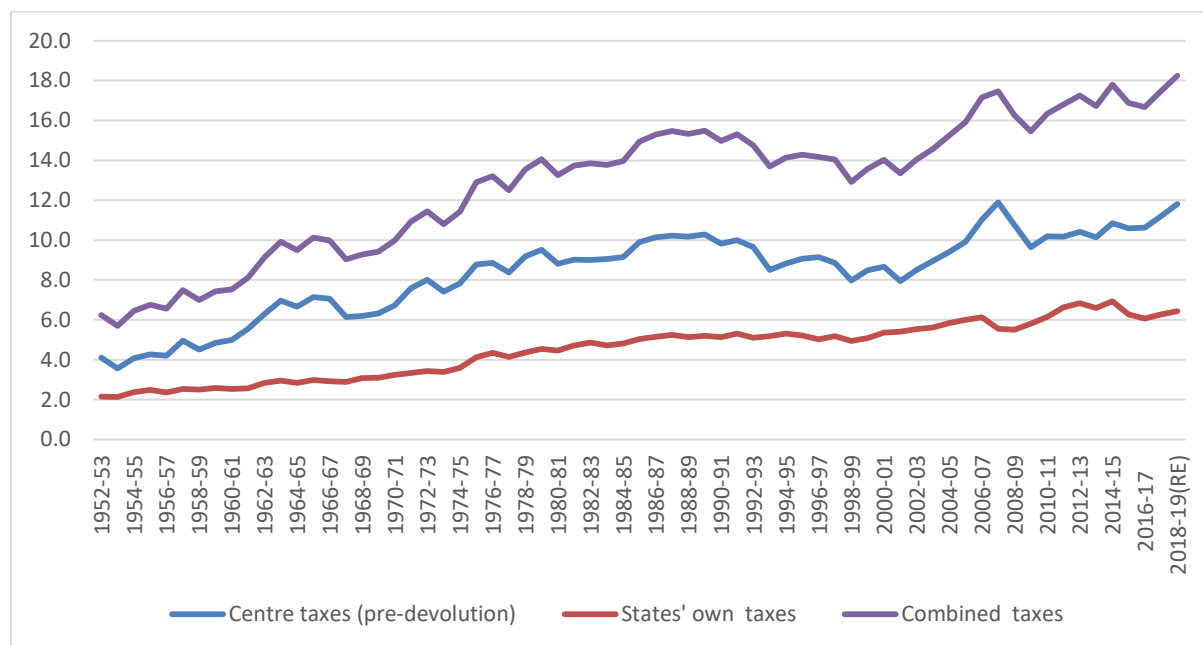
The Central government collected about 60-65% of the total revenue during the 1950s. Its share rose to 70% during mid-1960s, but fell later to reach 60% in 2001-02. It again rose reaching 68% in 2007-08 and dropped to 65% in 2018-19 (Figure 2.2). The remaining 30-40% of taxes relate to states' own taxes collected by them together. The share of states' own taxes in combined tax revenue of Centre and states was above 35% during mid-1950s, came down to remain between 30 and 35% till early 1990s, but rose subsequently reaching 39% in 2014-15 but coming down again to 35% in 2018-19. Thus, there have been periods when the states have made more efforts

⁶ We use data for the period 1952 to 2014 from Indian Public Finance Statistics (IPFS) published by Ministry of Finance supplanted by Economic Survey 2018-19 and Union Budget 2019-20 for later years. One difficulty is that data on the share of the states in Central revenue in ES differ somewhat from that of IPFS presumably due to coverage differences. For example, the share of states in IPFS is 2.0 to 3.9% higher than those in ES during 2010-11 and 2014-15. Hence, we have taken the annual growth rates since 2015-16 from ES and applied them on 2014-15 IPFS data so that the entire data series is on a comparable footing to the extent possible.

⁷ Tax-GDP ratio varies widely across countries depending on other sources of revenue available and functional responsibilities expected from the government regarding welfare measures. It is, for example, about 20% for China and Russia, 28% for Australia and South Africa, 32-34% for Brazil, Canada, Korea, US and UK.

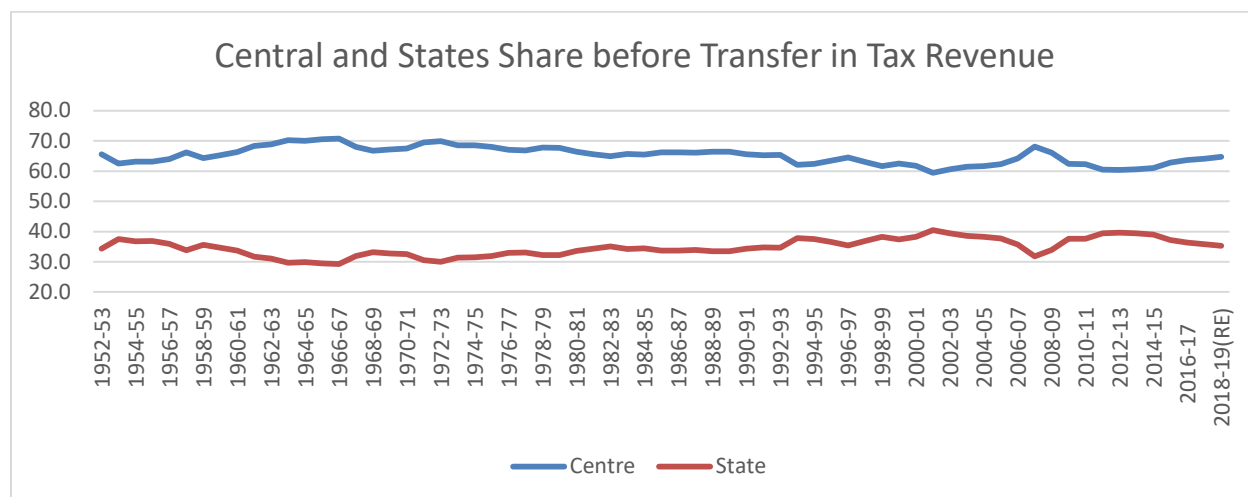
to raise their own taxes as during 2007 and 2014. More recently, the tax revenue of the Centre rose from 10.9% of GDP in 2014-15 to 11.8% in 2018-19 (RE), while states' own tax revenue dropped by 0.5% to 6.4% during the same period.

Figure 2.1. Tax-GDP Ratios of Centre and States 1952-2018 (%)

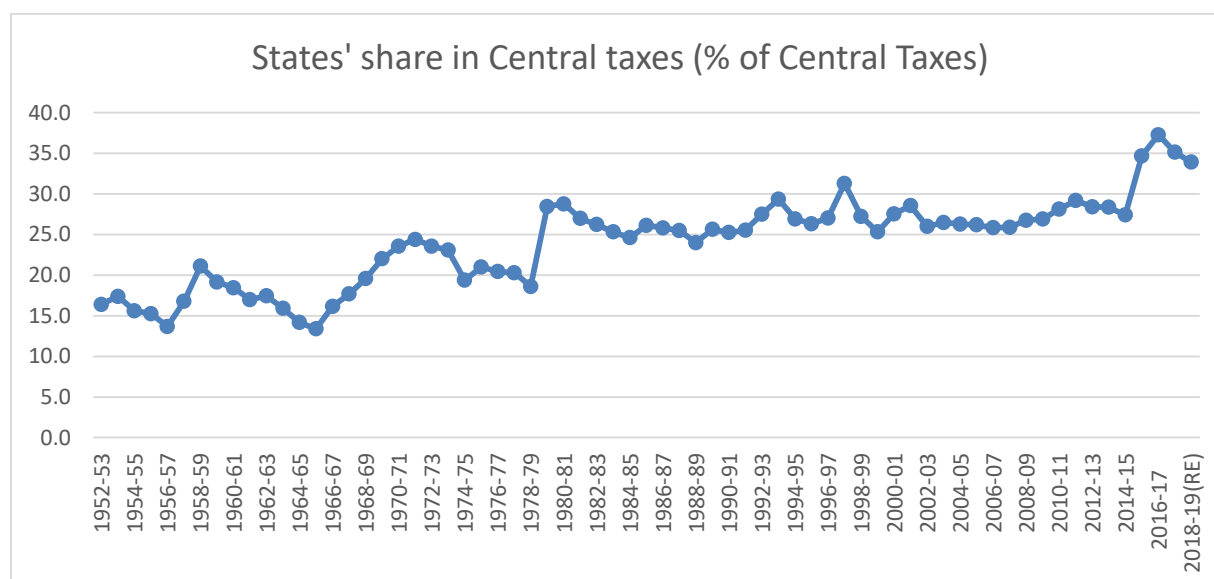


Sources: Based on Data from Indian Public Finance Statistics till 2014-15, Economic Survey and Union Budget for later years.

Of the tax revenue collected by it, the Centre has been passing on a substantial portion to the states based on recommendations of the Finance Commissions. The share of states in Central taxes would differ from the FC recommendations since the latter applies to 'divisible pool' comprising of total central taxes excluding revenue from cesses and surcharges, cost of collection, and certain earmarked taxes. This share rose from around 15% in mid-1950s to above 25% by late 1970s and mostly fluctuated between 26% and 29% later till 2014-15, but rose to 34-37% more recently (Figure 2.3). Looking at another way as a percentage of GDP, states' share in Central taxes jumped from 3% of GDP in 2014-15 to 3.7% in 2015-16, rose further to 4% in 2016-17 and remain around this level in the following 2 years. Thus, the recommendations of the 14th FC has meant an additional devolution of close to 1% of GDP in the first 4 years of the award period.

Figure 2.2. Central and States' Share in Combined Tax Revenue 1952-2018 (before transfer to States)

Source: Based on Data from Indian Public Finance Statistics

Figure 2.3. Share of States in Central Tax Revenue 1952-2018 (%)

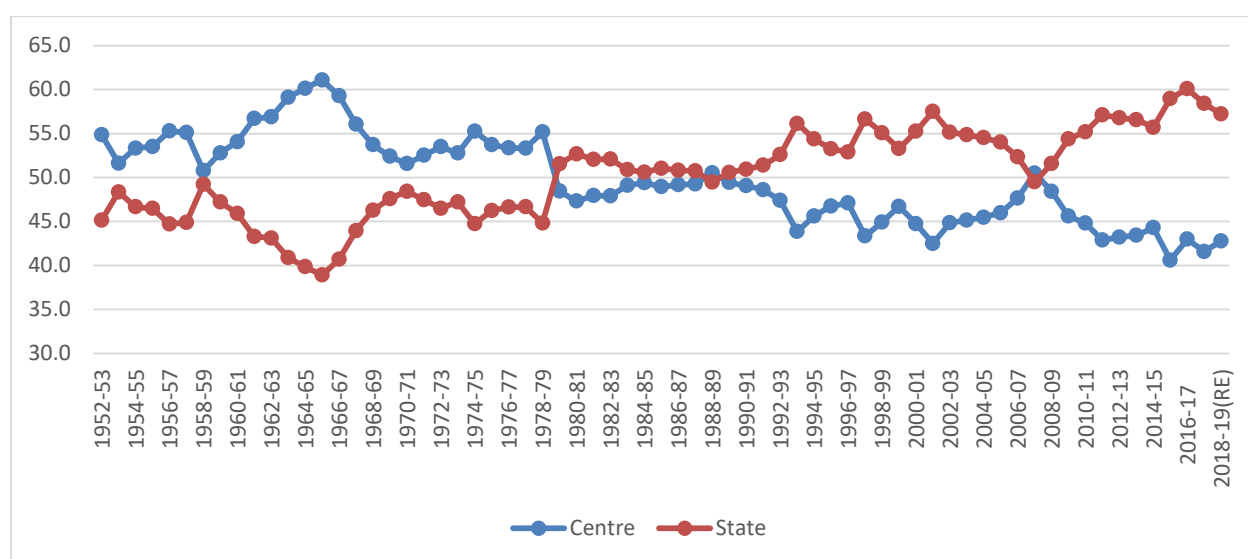
Source: Based on Data from Indian Public Finance Statistics

Impact of Devolution

Now, in order to understand the quantitative dimension of the role of the FC recommendations in vertical equity in recent years, revenue shares of centre and states can be compared under two alternative scenarios: a scenario without central transfers (as in Figure 2.2 above) and another scenario with central transfers (Figure 2.4 below). Given that the states have a constitutional

right to use the revenue they collect, a comparison of these scenarios can reveal the impact of vertical devolution from centre to states. An examination of these two scenarios shows that on average, the Centre's share in the combined revenue before transfer was between 61 and 64% and that of the states between 36 and 39% respectively. The proportion going to the Centre in combined revenue receipt after devolution reduces to vary between 44 and 47% while that of states increases to stay between 53 and 61%. The pre-devolution dominant position of the Centre in relation to the states thus clearly gets reversed. As Figure 2.4 reveals the Centre's dominance got weakened particularly after 1990-91 when states' share have consistently been higher than that of the Centre.

Figure 2.4 Central and States Share after Transfer in Tax Revenue 1952-2018



Source: Based on Data from Indian Public Finance Statistics

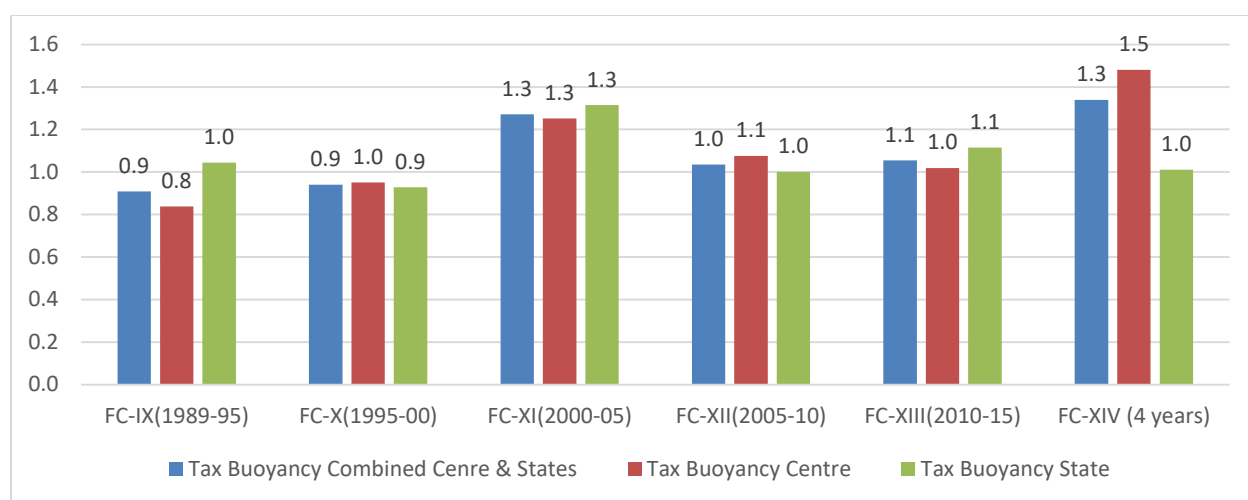
2.2 Tax Buoyancy and State Own Tax Revenue

In addition to trends in taxes, relative tax buoyancy of the Centre and the states has been a factor considered by some FCs in decision regarding extent of devolution. The 12th FC, for example, explicitly states the buoyancy consideration. Figure 2.5 shows the tax buoyancy of central taxes, states' own taxes, and combined tax revenue. The central taxes have been more buoyant than the states during 1995-2000, 2005-10 and 2015-18, but it has not always been so. The state taxes were more buoyant than the Centre during 2000-2005 and 2010-15. Given this relative behavior, it is difficult to judge the tax buoyancy of the states vis-à-vis that of Centre during the award

period of the 15th FC. On a longer term basis, tax buoyancy of the Centre has been 1.16 and 1.12 during 1951 to 1999 and that of the states 1.18 and 1.08 for the same periods.

Another point may also be noted in this context. With the introduction of GST in 2017, the centre and the states now share a common tax base for a large part of the indirect taxes and as such the GST revenue accruing the Centre and states are likely to grow at the same rate.

Figure 2.5: Buoyancy of Centre's tax revenue and States' own tax revenue



2.3 Expenditure Share and Implications for Vertical fiscal gap

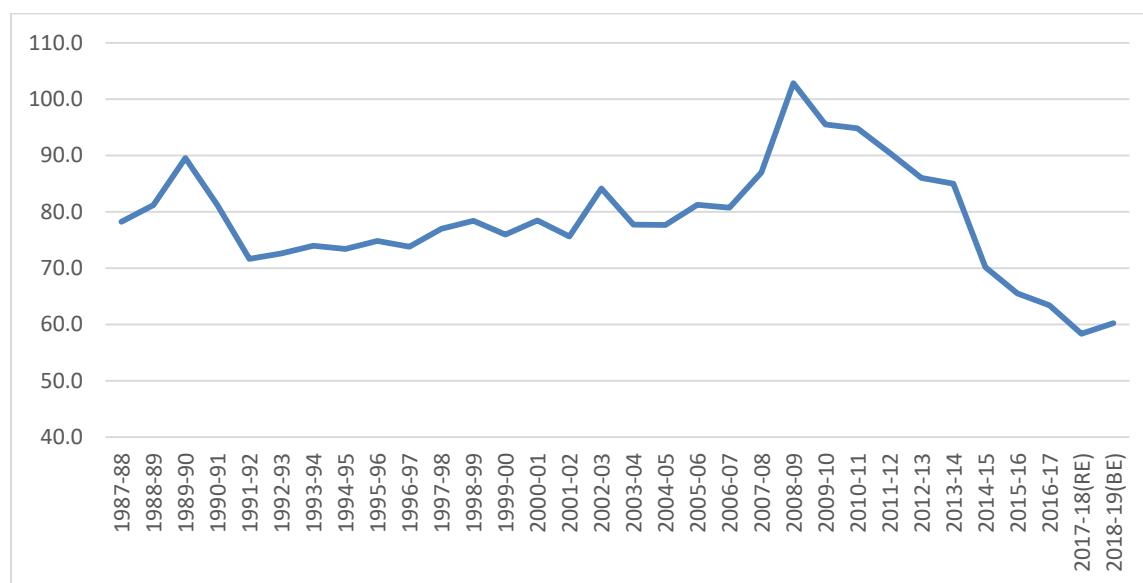
The reversal of the dominant position of the centre in tax revenue in favour the states post-devolution noted above gets reflected in the revenue expenditure of the centre and the states. Revenue expenditure of the states have been higher than that of centre, on an average basis, for the award periods of 14 FCs. The Centre's share in combined revenue expenditure varied between 40 to 44 percent while that of states between 56 to 60 percent during the award periods of 1st to 11th FCs (Table 2.1). The share of the Centre rose by 2-3 percentage points to reach 47.1 and 45.9% during 12th and 13th FC respectively with a corresponding reduction in share of the states.

Table 2.1 Share of union and the States in the Combined Revenue Expenditure (%)

Table 2.1 Share of union and the States in the Combined Revenue Expenditure (%)		
Finance Commission/Year	State	Centre
FC-1 (1952-57)	59.2	40.8
FC-2(1957-62)	58.2	41.8
FC-3(1962-66)	53.9	46.1
FC-4(1966-69)	58.2	41.8
FC-5(1969-74)	60.0	40.0
FC-6(1974-79)	55.8	44.2
FC-7(1979-84)	58.0	42.0
FC-8(1984-89)	55.8	44.2
FC-9 (1989-95)	56.5	43.5
FC-10 (1995-00)	56.8	43.2
FC-11 (2000-05)	56.0	44.0
FC-12 (2005-10)	52.9	47.1
FC-13 (2010-15)	54.1	45.9
FC-14 (First Four Years)	61.8	38.2

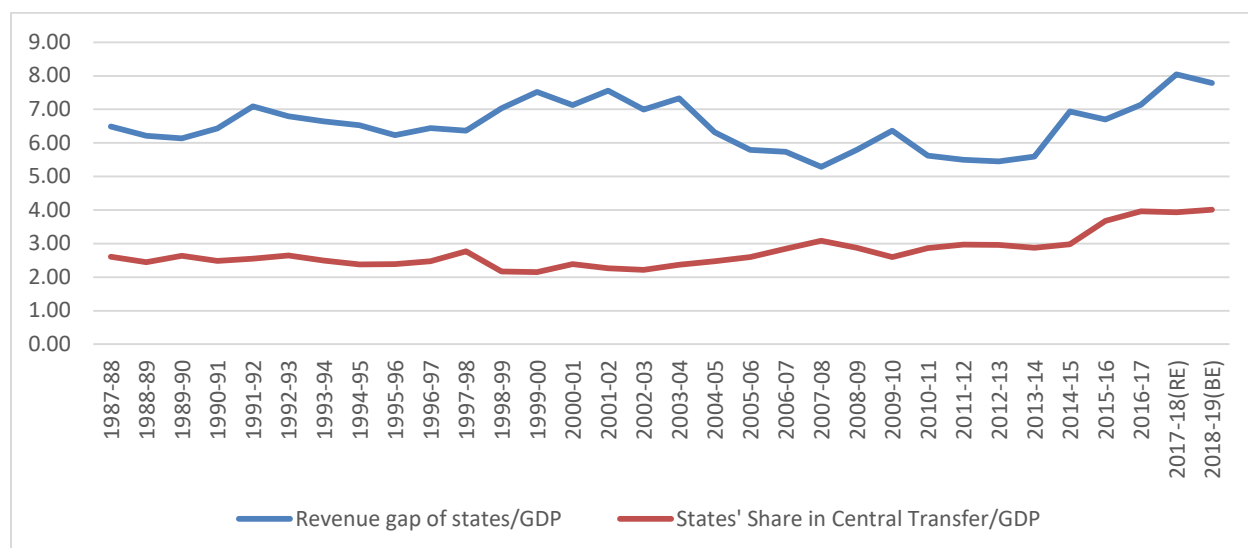
Source: Handbook of statistics on Indian Economy, RBI

During the last decade, the share of Centre in combined revenue expenditure has fallen from 47.1% during 2005-10 to 38.2% during 2015-18 with a corresponding rise in expenditure of the states. These figures represent a change of about 9 percentage points as compared to the 12th FC award period. Looked at another way, the ratio of Centre's current expenditure to that of the states was close to 1 in late-1990s and has been declining steadily since 2010-11. It dropped down to 0.70 in 2014-15 and further to around 0.60 during last two years. This has considerably changed the balance in revenue expenditure in favour of the states in recent years.

Figure 2.6 Percentage of Current Expenditure of Centre to that of States

Next, we consider revenue gap of the states defined in this context as revenue expenditure of states less states' own tax revenue. For example, expressed as a percentage of GDP, a revenue expenditure of 11% and own tax revenue of 5% would imply a revenue gap 6%. Figure 2.7 indicates the revenue gap and states' share in central taxes for the last three decades. The revenue gap was in between 6 and 7.5% of GDP during 1987-88 to 2004-05, dropped down to below 6% during 2005-06 and 2013-14 and jumped up to reach 8% during 2017-18 (RE) and 2018-19 (BE). The more recent numbers are due to the fact that revenue expenditure of the states increased to 14% of GDP while own taxes remained at 6%.

What is the extent to which tax devolution helps to fill up revenue gap of states? Figure 2.7 also shows the tax devolution of as a percentage of GDP. It has increased from 2.8% in late 1980s to 4% of GDP. As Table 2.2 indicates tax devolution helped to fill up states' revenue gap by 33% to 38% during the award periods of 9th to 11th FCs. The extent of help due to tax devolution increased sharply to 48% during 12th FC and further rose to 48%, 50% during 13th FC and 52% during first 4 years of 14th FC. Thus, tax devolution recommended by FCs have substantially helped the states to bridge their revenue gap. The balance of the gap, of course, is met by non-tax revenue, specific purpose FC grants, other Central transfers, and borrowings.

Figure 2.7: Revenue Gap of States and Tax Devolution as percentage of GDP**Table 2.2:** Revenue Gap and Tax Devolution as % of GDP

Finance Commission/Year	Revenue Expenditure of the States	States' own Tax Revenue	Revenue Gap for states (%)	Devolution as a percentage of GDP	Devolution as a % of Revenue Gap of the states
FC-9(1989-95)	11.81	5.21	6.60	2.53	38.34
FC-10(1995-00)	11.81	5.09	6.72	2.39	35.58
FC-11(2000-05)	12.62	5.55	7.06	2.34	33.15
FC-12(2005-10)	11.60	5.80	5.80	2.80	48.30
FC-13(2010-15)	12.22	6.63	5.82	2.93	50.36
FC-14 (4 years)	13.68	6.26	7.42	3.89	52.51

Source: Indian Public Finance Statistics (Various Issue) and Economic Survey 2018-19

Chapter 3: Trends and Patterns in Horizontal Fiscal Devolution

(TOR 3: Summarize the trends and patterns in horizontal fiscal devolutions across states along with states' own effort to raise resources and maintain fiscal discipline

3.1 Criteria for Horizontal Equity

As mentioned in Chapter 1, the past FCs have used various criteria for achieving horizontal equity, focused primarily on economic, geographic and demographic characteristics of Indian states. While interstate differences are a key consideration, decision making on allocations for intrastate differences in equity or budgetary allocations across social sectors within the state are upto the individual states. Summarized below are the criteria that have been used by the past 4 FCs in making devolutions.

3.1.1 Factors reflecting needs:

a. Population (1971):

The 11th FC stated that “population reflects public requirement of public goods and services” and the 13th FC mentioned that “population is an indicator for the expenditure needs of a state”. The 13th FC clarified that the criterion ensures equal per capita transfers to all states, without taking into account cost disabilities across states because of differences in the geographical spread of population.

Population figures given in the 1971 census forms the basis as is mandated by the Terms of Reference for the last four FCs. The importance of the indicator moved from 10% in the 11th FC to 25% in the 12th FC and 13th FC, but reduced to 17.5% in the 14th FC due to additional consideration of 2011 population data separately.

b. Demographic changes- Population (2011)

The 14th Commission deliberated on inclusion of demographic changes that had taken place since 1971, especially changes in the composition of population and migration. This was to address the concerns of differences in fertility rate amongst states. In addition, the 14th FC mentioned that it considered migration as an important factor which affected the population of the State other than fertility and mortality. In regard to whether net-migration should be taken as

an indicator, the 14th FC mentioned that it would “place a double burden on States from where out-migration is taking place.”

The 14th FC assigned a 10 per cent weight to the 2011 population.

c. Income distance:

The 12th FC mentioned that the income distance criteria ensured that there was progressivity in distribution. The 11th FC stated that the core criteria used in the previous FCs for providing higher per capita devolution to lower per capita income states are distance and inverse-income formulae, whereas the inverse income formulae had been discarded in the 10th FC.

The inverse income formula was discarded by the 10th FC stating that “due to the implicit convexity in the formula the middle-income states would have to bear a relatively higher burden.”

Prior to the 11th FC, NSDP was used to calculate distances, but taking into consideration the state of collection and processing of income related data in the states, GSDP was considered to give a better inter-state comparability of domestic economic activity thereafter. The distance was calculated between the per capita income of a state and the weighted average of the states with the three highest per capita income (11th FC); between the average per capita GSDP of each of the 28 states for the last 3 years and the weighted average of the states with the three highest per capita income (12th FC); between the average per capita GSDP of each of the 29 states for the last 3 years and the state with the highest per capita income (14th FC). .

Income distance index was assigned a weight of 62.5% in the 11th FC, 50 percent in the 12th FC and 50% in the 14th FC.

d. Fiscal capacity Distance

The 13th FC claimed that the income distance criterion used by FC 12 (measured through per capita GSDP) was a proxy for the distance between states in tax capacity. The 13th FC went on to state that “When so proxied, the procedure implicitly applies a single average tax-to-GSDP ratio to determine fiscal capacity distance between states.” In addition, the 13th FC recommended the use of separate averages for measuring tax capacity- one for general category states and another for special category states. The 13th FC mentioned that “The use of average tax-to-GSDP ratios specific to each category neutralizes to an extent the fiscal disadvantage of special category states in terms of tax capacity.”

The 13th FC justified the distinction of two categories of states by stating that “a single average applied (implicitly) to GSDP does not accurately capture the fiscal distance between the two groups.” The 13th FC stated that this was because “GSDP did not accurately capture the taxable base.”

13th FC assigned a weight of 47.5 per cent to the fiscal capacity distance criterion.

The 14th FC rejected the 13th FC’s fiscal capacity distance and reverted to income distance because it observed that “the relationship between income and tax is non-linear, as the consumption basket differed between high, middle and low income States.”

3.1.2 Cost disability Indicators

a. Area

It was mentioned in the 11th FC that “states with larger area and low density of population would have to incur heavy expenditure for providing basic administrative infrastructure.” The 13th FC noted that the 10th FC introduced area on the grounds that states with larger area incur more costs to provide comparable services but believed that the cost of provision of services increases at a decreasing rate with the size of states with the incremental costs becoming negligible after a point. In addition, the 12th FC noted that smaller states also had to spend some minimum amount to establish required frameworks of governmental machinery.” Area shares have a floor of 2% and a ceiling of 10% in the 11th FC. The 12th FC, 13th FC and 14th FC retained the floor but removed the ceiling after realizing that only Rajasthan marginally exceeds 10%. As mentioned in the 12th FC, states with less than 2 per cent share in total area, were assigned a minimum share of 2 per cent.

b. Index of Infrastructure

The 12th FC states that the Index of infrastructure refers to “the relative availability of economic and social infrastructure in the state” and additionally mentions that the index is inversely proportional to the share of the state. The argument in support for the index of infrastructure was put forth by the 11th FC which stated that infrastructure was critical in order to attract investment which made a case for assisting states with low index of infrastructure. The 12th FC found the infrastructure criterion to be correlated with income distance and concluded that it was better to use the index in an ordinal way and hence dropped the criterion.

c. Forest Cover

Forest cover was introduced into the horizontal devolution formula in the 14th FC, though there has been mention of forest cover in the reports of the previous commissions.

The 14th FC argued that “Forests and the externalities arising from them impact both the revenue capacities and the expenditure needs of the States” and believed that there needs to be a compensation for the cost disability and encouragement to the states regarding the maintenance and additions to green cover. The 14th FC hence concluded that “A large forest cover provides huge ecological benefits, but there is also an opportunity cost in terms of area not available for other economic activities and this also serves as an important indicator of fiscal disability.” and hence assigned 7.5 per cent weight to the forest cover.

3.1.3 Fiscal efficiency indicators

a. Tax effort

The 11th FC report mentioned that the ToR of the 11th FC explicitly mentioned consideration of incentives to encourage better utilization of tax and non-tax revenue and proposed the tax effort indicator as a solution. As mentioned in the 11th FC, “Tax effort was to be measured by the ratio of a state’s per capita own tax revenue to its per capita income and weighed by the inverse of the per capita income.” [(Per capita OTR/Per capita GSDP of state i)* (1/Per capita GSDP of state i)]. Hence the 11th FC noted that, a poorer state utilizing its tax base as much as a rich state would get additional consideration in the formula.

The 12th FC modified the formula by taking a three-year average of the ratio of own tax revenue to comparable GSDP (not per capita) and weighted it by the square root of the inverse of per capita GSDP. [(Sum of three year OTR: GSDP ratios/3)* $\sqrt{1/\text{per capita GSDP}}$] which would ensure that a poorer state would get even higher weightage under this case.

The 11th FC reduced the weight of inverse of income from 1 to 0.5. The weightage given to the entire tax effort component was 5% in the 11th FC and increased to 7.5% in the 12th FC due to the commission perceiving and stating an urgent need for fiscal consolidation.

b. Fiscal Discipline

The 11th FC mentioned that fiscal discipline was an indicator that had come out of the requirement for a further incentive for better fiscal management after taking into account the fiscal situation of the states and the need for restructuring.

The 11th FC explained that “The index of fiscal discipline considers an improvement in the ratio of own revenue receipts to total revenue expenditure in comparison to a similar ratio for all states.” The 12th FC added that “If all the revenue performances of states are increasing, the state where improvement is relatively more than average is rewarded more.” The 13th FC thought there was “a strong case to incentivize states to follow fiscal prudence, particularly in relation to fiscal correction” and increased the weight from 7.5% in the 11th and 12th FC to 17.5% in the 13th FC. To the 14th FC, states argued that “this criterion places an extra burden on states with revenue deficits” and its weight should therefore be reduced” and the indicator was removed in the 14th FC.

Other criteria suggested by states over the years

Some of the other criteria suggested by states to the previous commissions can be summarized as follows: (refer Table 3.1)

Table 3.1 Criteria suggested by states, 11th to 14th FC

11 th FC	13 th FC	14 th FC
Population control	Population BPL	Short and long term
Population BPL	Length of international	Migration
Composite index of	border	SC/ST population
backwardness	Levels of backwardness	Incentive indicator for
Contribution to central	HDI	reducing fiscal capacity
taxes	Share of primary sector in	distance (using Gini)
Expenditure on HR	GSDP	HDI
Development	Contribution to central taxes	Poverty ratio
Administration and social	Expenditure on social	
services expenditure	structures and infrastructure	
Expenditure on		
maintenance of social		
structures and		
infrastructure		
Central Investment		
Employment rate		
Population of SC/ST		
Proportion of people		
above 60 years of age		
Density of population		

Source: Authors' Compilation from various Finance Commission Reports, 11, 12, 13, 14

Note: The 12th FC has not been included in this table since the report does not provide information on additional criterion suggested by states for horizontal devolution. The 12th FC document only contains information on the

states' preferences on the components of population, income distance, area, tax effort, fiscal discipline which have already been covered in detail in this section.

3.2 Review of the trend and pattern of criteria

A review of the criteria adopted by successive FCs in India for tax devolution presented in Table 3.2 reveals that income or indirectly the tax capacity of the state is the major criteria accounting for distribution of more than 50 percent of sharable tax revenue of centre among states in successive FCs starting from the 8th FC. Demographic factors accounted for a share ranging between 10-25 percent. Among earlier FCs, income distance was given 25 percent weight by 6th FC while 7th FC gave a weight of 25 percent in the name of revenue equalization. Therefore, the criteria of income distance have been alternatively considered as fiscal capacity (13th FC) and revenue equalization (7th FC). Incentive based criteria of index of infrastructure was considered by 10th and 11th FCs, tax effort by 10th, 11th and 12th FCs and, fiscal discipline by 11th, 12th and 13th FCs.

An analysis of the shares (in %) of different states over the 14th FC periods, reveals that there was not much variation in shares of each state in the net proceeds of all sharable central taxes. It can be considered as an expected result given that the dominating criteria for distribution of central revenue across states are population and income distance. Almost 75 per cent of devolution has been distributed based on these two criteria. The problem of inequity of incomes among different states was directly addressed by 4th, 5th and 9th FCs by considering an index of backwardness of states as a criterion while the 7th FC addressed this problem by considering the poverty ratio as a criterion for distributing sharable central tax revenue among states.

The successive FCs have mostly been guided by performance and need based criteria for devolution. Per capita income (income distance) or fiscal capacity (13th FC) of the state is considered for capturing the state's capacity for raising taxes and the criteria of population and area are considered as need based.

Table 3.2: Criteria Adopted for Devolution of Sharable Tax Revenue by FCs in India

Criteria	1 st FC		2 nd FC		3 rd FC		4 th FC		5 th FC		6 th FC	
	Income Tax	Union Excise	Income Tax	Union Excise	Income Tax	Union Excise	Income Tax	Union Excise	Income Tax	Union Excise	Income Tax	Union Excise
Population	80	100	90	90	80		80	80	90	80	90	75
Demographic Change												
Income (Distance)										13.34		25
Area												
Index of Infrastructure												
Tax Effort												
Fiscal Discipline												
Forest cover												
Inverse of Income												
Index of Backwardness								20		6.66		
Poverty Ratio												
Revenue Equalization												
Discretionary Adjustment				10		100						

(Continued...)

Criteria	7 th FC		8 th FC		9 th FC		10 th FC		11 th FC	12 th FC	13 th FC	14 th FC
	Income Tax	Union Excise	Income Tax	Union Excise	Income Tax	Union Excise	Income Tax	Union Excise				
Population	90	25	22.5	25	22.5	25	20	20	10	25	25	17.5 (1971 population)
Demographic Change												10 (2011 population)
Income (Distance)			45	50	45	33.5	60	60	62.5	50	47.5*	50
Area							5	5	7.5	10	10	15
Index of Infrastructure							5	5	7.5			
Tax Effort							10	10	5	7.5		
Fiscal Discipline									7.5	7.5	17.5	
Forest cover												7.5
Inverse of Income		25	22.5	25	11.25	12.5						
Index of Backwardness					11.25	12.5						
Poverty Ratio		25										
Revenue Equalization		25										
Discretionary Adjustment												

*Income distance is measured as fiscal capacity

Source: Reddy and Reddy (2019)

Chapter 4: Factors affecting devolution trends

(TOR 4: Analysis of major factors affecting the horizontal and vertical devolution trends)

4.1 Equity and Budgetary Policies of Centre and States

Budgetary policies of government are guided by the objectives of efficiency in resource allocation and equity. To achieve the equity objective, government has to resort to progressive taxes and redistributive public expenditures at the cost of foregoing some degree of efficiency in resource allocation. Studies which have used normative approaches for studying welfare effects of taxes have shown that personal income and corporate profit taxes in India are moderately progressive while commodity taxes (levied through VAT until recently) are regressive. A research project done by Institute of Economic Growth for NITI Aayog, Government of India in 2018⁸ provides estimates of incidence of commodity taxes and GST in India by fractile groups of monthly per capita expenditure (MPCE) classes and 15 commodity groups for both rural and urban sectors. These estimates are obtained using National Sample Survey (NSS) consumer expenditure data of 68th round(2011-2012), the information about state VAT rates and MODVAT rates for the year 2013-14, and income tax data for the assessment year 2014-15. The estimates of marginal tax rates reveal that commodity taxes (central excise plus state vat or even hypothetical GST considered) are not consistently progressive as the MPCE increases up to median level and become regressive afterward (see Appendix Table 4.A.1, 4.A.2). Marginal tax rates for income taxes show significant progressivity. (Table 4.A.3 in Appendix)

An evaluation of tax policies in the same study through a normative welfare function provides insights on inequality aversion parameter estimates (e) or elasticity of social marginal utility implicit in the commodity and income tax policies. The estimates of e for commodity taxes is less than 1 showing that the Indian government has shown less aversion to income inequalities in designing commodity taxes. In the case of income taxes this parameter takes value more than 1.5 implying that it shows moderate concern for inequality in income distribution. These details are given in Table 4.1 as below.

⁸Source Murty et al., (2018) for details.

Table 4.1 Estimates of Inequality Aversion Parameter (ϵ) Implicit in Commodity and Income Taxes in India

Type of Tax	Rural	Urban	All India
VAT	-0.754	-0.703	-0.916
GST	-0.833	-0.814	
Income Tax			-1.590

Source: Murty et al. 2018

4.2 Equalizing Effects of Central Transfers to States

Resource transfers from centre to states in India could be broadly classified as general purpose and specific purpose grants. Until recently, all general purpose grants and some specific purpose grants were made on the recommendations of FCs while most specific purpose grants were made as plan grants by the Planning Commission. Grants for specific projects and centrally sponsored schemes were made by different government departments and ministries. With the abolition of the Planning Commission in August 2014, most of the transfers are now made as per the recommendations of FC. All general purpose grants are now made as per the recommendations of FC while the specific purpose grants are given by central ministries. The 14th FC's increase in share of states in the divisible pool of resources to 42 percent was done both for compensating plan expenditure grants foregone and for giving more flexibility to states in resource allocation through untied grants.

To judge the merits of general transfer vis a vis specific transfer, it is important to analyse the revenue and expenditure equalization properties of these transfers. The information about the estimates of elasticities of state per capita revenue and per capita expenditure with respect to per capita SDP could be helpful in this regard. Elasticity estimates of state own tax revenue (1.08) were found to be higher than that of the state post transfer or total revenue (0.58). It indicates that transfers from Centre to states have some equalizing effects on per capita total revenue available to states. In addition, analysis reveals that there was no significant difference between the elasticity of total expenditure (0.58) and the elasticity of revenue expenditure (0.59) (refer table 4.2).

Table 4.2 Estimates of Elasticity of State Per capita Revenue and Total Expenditures with Respect to State Per capita SDP

Category	Regression Coefficient	Adj. R square
Per capita revenue expenditure	0.59	0.34
Per capita total expenditure	0.58	0.35

Source: Estimated as explained in the text.

4.3 Effects of Transfers on Social Sector Needs of States and Centre: An empirical Analysis

Both Centre and states incur developmental expenditure which could be for social services or economic services. In this section, we analyse the total social sector expenditure for Centre and States.

It is expected that since social sector expenditure should contribute to a social good (well-being), there are positive externalities. Expenditure on social sector services⁹ by centre and states is thus an indicator of government's concern for the well-being of people. For instance, one could expect poorer states and states with specific geographical disadvantages (for instance North Eastern Hill states) to spend higher per cent of their SDP for social sector services in comparison to others due to various reasons such as the low level of services and terrain specific issues such as remoteness and higher costs in hill areas (Dasgupta & Goldar, 2017, Gioli, et al., 2019).

Table 4.3 provides information about social sector expenditure by different states as percent of state SDP for the years 2015 and 2016. In the year 2016, these vary from 16.37 per cent (Arunachal Pradesh) to 3.06 per cent (Delhi).

Table 4.3 Social Sector Expenditure of States (SSE) as Percentage of Gross State Domestic Product (GSDP)

⁹Social Sector includes expenditure on General Education, Technical Education, Sports and Youth Services, Arts and Culture, Medical and Public Health, Family Welfare, Water Supply and Sanitation, Housing, Urban Development, Information & Publicity, Broadcasting, Welfare of SC, ST and OBC, Labour and Employment, Social Security & Welfare, Nutrition, Natural Calamities, Other Social Services, Secretariat Social Services & North Eastern Areas.

State	SSE/GSDP (%) (2015)	SSE/GSDP (%) (2016)	Difference
Andhra Pradesh	8.01	7.52	-0.49
Arunachal Pradesh	14.58	16.37	1.79
Assam	8.10	9.47	1.36
Bihar	10.14	10.10	-0.04
Chhattisgarh	6.96	8.20	1.24
Actual Goa	6.50	6.14	-0.36
Gujarat	4.73	4.43	-0.30
Haryana	4.76	4.94	0.19
Himachal Pradesh	7.77	8.49	0.72
Jammu & Kashmir	11.76	10.49	-1.27
Jharkhand	6.86	7.93	1.07
Karnataka	5.10	5.40	0.31
Kerala	5.13	5.70	0.56
Madhya Pradesh	8.61	8.01	-0.60
Maharashtra	4.24	4.12	-0.12
Manipur	12.27	11.47	-0.80
Meghalaya	10.34	12.51	2.17
Mizoram	15.85	13.89	-1.97
Nagaland	12.02	12.32	0.30
Odisha	8.33	8.09	-0.24
Punjab	4.02	3.91	-0.11
Rajasthan	7.22	7.30	0.08
Sikkim	8.48	8.37	-0.10
Tamil Nadu	5.20	4.72	-0.48
Telangana	5.75	5.95	0.20
Tripura	11.67	12.58	0.90
Uttarakhand	6.14	5.86	-0.28
Uttar Pradesh	8.41	8.85	0.44
West Bengal	5.37	5.79	0.42
NCT of Delhi	0.59	3.06	2.47
Puducherry	0.59	8.12	7.53

The recommendation of 14th FC to increase states' share in the tax revenue of the Centre to 42 per cent from the 32 percent recommended by the 13th FC was expected to have consequences for social sector spending by the Centre and States. The Centre while accepting this recommendation countered it with reductions in its own social sector spending through specific transfers.

Table 4.4 Expenditure of States on Health and Education as Percentage of State Domestic Product

	Health			Education		
	2014-15	2015-16	% difference	2014-15	2015-16	% Difference
Arunachal Pradesh	3.08	2.99	-0.09	6.27	6.81	0.55
Assam	0.88	1.88	1.00	5.72	6.92	1.20
Himachal Pradesh	1.05	1.22	0.17	4.23	4.93	0.70
Jammu & Kashmir	1.40	2.56	1.17	2.85	6.16	3.32
Manipur	3.17	2.71	-0.46	7.08	7.10	0.02
Meghalaya	2.13	2.11	-0.02	5.17	5.39	0.22
Mizoram	2.69	3.84	1.15	10.16	9.83	-0.33
Nagaland	2.34	2.90	0.55	6.27	8.11	1.84
Sikkim	1.87	1.91	0.03	5.49	5.57	0.09
Tripura	2.15	2.56	0.40	5.46	5.82	0.35
Uttarakhand	0.85	0.92	0.08	3.10	3.28	0.18
Sub-Total: NE&HS	1.27	1.80	0.40	4.56	5.61	1.05
<i>Other States (GS)</i>						
Andhra Pradesh	1.04	0.80	-0.24	3.16	2.77	-0.39
Bihar	0.88	1.02	0.14	4.02	5.17	1.14
Chhattisgarh	0.97	1.29	0.32	4.27	5.05	0.78
Goa	1.09	1.52	0.43	2.99	3.81	0.82
Gujarat	0.64	0.64	0.01	1.95	2.02	0.07
Haryana	0.51	0.57	0.06	2.23	2.36	0.14
Jharkhand	0.60	1.15	0.55	2.64	3.41	0.76
Karnataka	0.58	0.59	0.01	1.99	1.89	-0.10
Kerala	0.74	0.80	0.07	2.52	2.43	-0.09
Madhya Pradesh	0.96	1.02	0.06	3.67	4.00	0.33
Maharashtra	0.46	0.56	0.10	0.15	0.23	0.08
Odisha	1.03	1.16	0.14	3.29	3.59	0.30
Punjab	0.59	0.71	0.12	2.07	2.27	0.20
Rajasthan	1.05	1.20	0.15	3.17	3.27	0.10
Tamil Nadu	0.70	0.62	-0.07	2.22	2.05	-0.17
Telangana	0.49	0.75	0.26	1.34	1.78	0.44
Uttar Pradesh	1.15	1.33	0.19	3.39	4.05	0.66
West Bengal	0.80	0.77	-0.02	2.64	2.33	-0.31
Sub-Total: OS	0.74	0.81	0.07	2.59	2.73	0.14
Grand Total	0.77	0.87	0.10	2.71	2.90	0.1

As an illustration of the complexities, Table 4.4 provides information about the expenditure of states on health and education as a percentage of the SDP. During the budget years of 2014-15 and 2015-2016, health expenditure of North East and other Hill states has increased as a percentage of SDP from 1.27 to 1.80 while that of education expenditures has gone up from 4.56 to 5.61 per cent. However, there is only a modest rise in these expenditures for the rest of the states which are relatively developed. Yet, in per capita terms, richer states are able to spend much higher amounts on social sector expenditures, indicating that the general purpose transfers are unable to offset completely the revenue disabilities of low income states. This argument has found support in other empirical analysis as well (Rao, 2017 for instance). It would be of interest therefore to analyse in some detail the trend in SSE and its relationship with devolution by various FCs.

4.3.1 Trends in SSE

Table 4.5 provides information on social sector spending by Centre and states in recent times. The spending by states as a whole, as percent of GDP has been higher than that of Centre. Spending by states is 3 to 4 times higher than that of centre.

Table 4.5 Past Trends in Social Sector Spending by States and Centre

Year	States		Centre	
	Amount (Rs Crores)	Percent of GDP	Amount (Rs Crores)	Percent of GDP
1990-91	28,199	4.81	6,629	1.13
2000-01	1,01,551	4.68	25,542	1.18
2006-07	1,89,443	4.41	56,286	1.31
2007-08	2,12,712	4.27	78,768	1.58
2008-09	2,67,592	4.75	1,07,058	1.90
2009-10	3,38,921	5.23	1,22,104	1.88
2010-11	3,99,537	5.13	1,47,494	1.89
2011-12	4,60,502	5.27	1,40,932	1.61
2012-13	5,33,537	5.78	1,57,353	1.58
2013-14	6,74,148	5.98	1,74,855	1.55
2014-15 (RE)	6,99,173	5.62	2,01,983	1.62
2015-16 (RE)	8,99,157	6.58	2,28,846	1.67

Source: State of Indian Public Finance Statistics upto year 2012-13 for Centre and 2013-14 for States. For rest Budget Documents of State & Union Government.

The states expenditure on the social sector has been steadily increasing over time. Considering inter-state per capita social sector expenditures, we find that there is wide disparity. Table 4.6 provides a summary of the extent of disparity in this.

Table 4.6 Disparity in per capita social sector expenditure (pcsse)

Variable	Year	Observations	Mean	SD
Pcsse	2015-16	28	11416	5817
Percentiles	Interval	States	Values (in Rs)	
0%-25%	4712-8056	Bihar	4711	
		Uttar Pradesh	5050	
		Punjab	5528	
		Assam	6108	
		Jharkhand	6162	
		Madhya Pradesh	7154	
		Maharashtra	7865	
25%-50%	8056-9710	Odisha	8245	
		Gujarat	8327	
		Rajasthan	8506	
		Karnataka	9256	
		Tamil Nadu	9307	
		Haryana	9430	
		Kerala	9688	
50%-75%	9710-12820	Manipur	9730	
		Meghalaya	9905	
		Chhattisgarh	10003	
		Andhra Pradesh	11402	
		Telangana	11447	
		Jammu and Kashmir	11695	
		Uttarakhand	12495	
75%-100%	12820-25000	Nagaland	13143	
		Himachal Pradesh	13949	
		Tripura	14661	
		Arunachal Pradesh	22163	
		Mizoram	24244	
		Goa	24451	
		Sikkim	25000	

Source: Authors' calculations based on Social sector expenditure data from RBI state budgets.

Note: Per Capita SSE is measured in nominal/current terms.

It is immediately apparent that there is a lot of variation across states. Similar disparity is found for other years as well. For 2015, the median is smaller than the mean and the skewness is 1.31. The data might have a slight positive skew implying that most of the per capita social sector expenditure is concentrated towards the left (corresponding to below 50%). It can also be observed that many north eastern states have higher than median per capita social sector expenditure.

4.3.2 Results from an Econometric Analysis: SSE, NSDP and Devolution from FCs

A fixed effects regression model was run on a panel data set, comprising of annual data from 28 states, covering the period of three FCs, namely, the 12th, 13th and 14th FC (first 3 years).

The elasticity of social sector expenditure to net devolution (in nominal prices, absolute values) was found to be expectedly positive and statistically significant, though it is less than one, indicating that a rise in net devolution leads to a less than proportionate increase in social sector expenditure. The net devolution amount (in absolute values) is defined as gross devolution and transfers minus repayments of loans to Centre and interest payments on loans from Centre. On the other hand, the elasticity of social sector expenditure is higher (and positively significant) with regard to per capita NSDP than it is with regard to net devolution. While an increase in per capita NSDP leads to an increase in SSE, the share of social sector expenditure in NSDP is also positively and significantly impacted by the share of devolution that a state receives. Upon introducing dummies for capturing effects specific to each FC period, we find that the 12th FC dummy is negative, while the 14th FC dummy is positive, indicating that the SSE were positively associated with the period of the 14th FC. The 13th FC dummy changes signs depending on the specification and hence does not lend itself to a uniform conclusion, while for the other two FCs, the signs and significance remains robust across specifications. Details have been given in Table 4.7 below.

Table 4.7: Regression estimates

Specification (All are run as panel fixed effect models)	Per capita NSDP	Ln(Per capita NSDP)	Devolution share	(Net) Devolution values (absolute)	Ln(Net Devolution)	Dummy -12 th FC	Dummy-14 th FC
Ln SSE(nominal)= f(Ln Net Devolution)	-	-	-	-	0.90***	-	-
Ln SSE(nominal)= f(Ln Per Capita NSDP (current))	-	1.26***	-	-	-	-	-
SSE(nominal)= f(Per Capita NSDP (current))	0.002***	-	-	-	-	-	-
SSE(nominal)/ NSDP(current) = f(Per Capita NSDP (constant) , devolution share)	3.40e-07***	-	0.01**	-	-	-	-
SSE(nominal) = f(Per Capita NSDP (current) , Devolution Share, 12 th FC Dummy, 14 th FC Dummy)	0.002***	-	(-) 20.86	-	-	(-) 34.91***	45.4***

Legend: ***- p<0.01, **- p<0.05, *- p<0.1, If p>0.1- insignificant. All outliers beyond Mean+/-2SD were removed.
Source: Authors' estimations based on data from RBI state budgets

Our findings seem to indicate that the social sector expenditure is responsive to increase in both NSDP and devolution, the latter being more effective when routed through the general purpose transfer. One could potentially argue that specific central transfers may not be required therefore to meet these expenditures, rather such specific transfers can be designed for meeting specific national objectives other than those covered under existing social sector expenditure or where there are major inter-state implications. Such objectives could for instance include performance enhancing grants to support specific targets (e.g. meeting SDGs - creation of a carbon sink for SDG 13, tackling pollution, increasing clean energy access, disaster resilience, etc.) or inter-state concerns (e.g. efforts on GST and public finance management, ease of doing business, grants to local bodies, solid waste management, etc.)

4.4 Choice between Tax Devolution and Grants in Aid

One of the challenges for future FCs in India is about choosing between tax devolution and grants in aid in deciding about central transfers to states. In their representations to recent FCs states and centre have divergent views on this issue. A majority of states have been expressing

preferences for tax devolution while various ministries and departments of centre advocating for sector specific grants-in-aid to states. The past FCs have recommended grants-in-aid to states for five purposes – revenue deficit, disaster relief, local bodies, sector-specific schemes and state-specific schemes. These grants through FCs as non-plan grants are found to overlap with central assistance to states as plan grants. It is also found that state specific grants recommended by recent FCs are found to duplicate central sector schemes. Several concerns have been raised regarding the design of specific purpose grants, whether routed through Central ministries or through the FCs.

Taking these things in to consideration, 14th FC in its recommendation noted that grants for both sector-specific and state-specific schemes by the FC are not necessary. In compensation, it has increased states' share of sharable tax revenue of centre to 42 per cent from 32 percent recommended by 13th FC. This recommendation is expected to facilitate the substitution of general purpose transfers to sector and state specific transfers and thus reducing centre's share in sector specific expenditures in the states. Also, this approach is expected to provide more leverage to states to plan their spending according to their specific sector needs. Table 4.8 provides information about grants- in- aid to different states recommended by 14th FC.

We find that in the context of social sector expenditures, the expenditures are hugely divergent across states. As some other scholars have also pointed out sometimes even richer states suffer from social and economic infrastructural deficits, which tend to argue in favor of having specific purpose grants (for instance, See Rao, 2017). Further, large variations in fiscal capacities among states that are not offset by general purpose transfers (tax devolution), raises concerns in favor of achieving equalization through specific transfers targeted at social sectors. If richer states end up with higher spending on major social and economic services while the tax devolution is unable to counter the fiscal disability of poorer states, it could lead to enhanced inequality. The persistence of such inequities is troubling. However, it is also argued that there is evidence that, when grants are routed through the FC, it achieves more equalization, preserves incentive properties and ensures achievement of ultimate developmental goals, than when it comes through the Central ministries (Rao, 2017, Rajaraman & Gupta, 2016 for local governments).

Table 4.8: Grants-in-aid to States Recommended by 14th Finance Commission (Rs. Crores)

Sector	Amount (Rs Crores)
Local Government	287436
Disaster Management	55097
Post-devolution Revenue Deficit	194821
Total	537354

Source: Report of 14th Finance Commission, Government of India

Appendix: Chapter 4**Table 4.A.1: Incidence of Indirect Taxes by Expenditure Groups in India (Rural and Urban)**

Fractile Class	Rural				Urban		
	MPCE: Y	Commodity tax liability: T(Y)	Marginal tax rates: T'(Y)	F(Y)	MPCE: Y	Commodity tax liability: T(Y)	Marginal tax rates: T'(Y)
0-5%	446.18	57.48		0.03	617.69	78.52	
5-10%	563.69	72.41	0.13	0.04	795.78	101.34	0.13
10-20%	663.47	85.87	0.13	0.07	978.50	121.29	0.11
20-30%	773.81	100.11	0.13	0.08	1192.04	146.21	0.12
30-40%	876.19	114.11	0.14	0.08	1400.87	167.39	0.10
40-50%	976.58	127.26	0.13	0.09	1632.16	190.93	0.10
50-60%	1099.82	144.37	0.14	0.09	1907.49	219.85	0.11
60-70%	1248.53	162.06	0.12	0.10	2245.74	253.59	0.10
70-80%	1451.73	187.01	0.12	0.12	2729.81	300.55	0.10
80-90%	1785.61	224.55	0.11	0.14	3562.57	370.58	0.08
90-95%	2291.90	274.95	0.1	0.08	4994.43	475.75	0.07
95-100%	4525.64	383.47	0.05	0.09	10279.41	722.78	0.05
All Classes	1278.94	153.95	0.07	1	2399.24	245.95	0.06

Source: Authors' calculations as part of report NITI Aayog, 2018 using NSSO 68th round data

Table 4.A.2: Incidence of GST by Expenditure Groups in India (Rural and Urban)

Fractile	Rural				Urban			
	Y	F(Y)	T(Y)	T'(Y)	Y	F(Y)	T(Y)	T'(Y)
0-5%	446.18	0.03	40.19	-	617.69	0.07	55.66	
5-10%	563.69	0.04	50.69	0.09	795.78	0.06	71.73	0.09
10-20%	663.47	0.07	60.71	0.10	978.50	0.12	88.41	0.09
20-30%	773.81	0.08	71.01	0.09	1192.04	0.10	108.27	0.09
30-40%	876.19	0.08	81.38	0.10	1400.87	0.10	126.05	0.09
40-50%	976.58	0.09	91.61	0.10	1632.16	0.09	145.18	0.08
50-60%	1099.82	0.09	103.94	0.10	1907.49	0.09	169.87	0.09
60-70%	1248.53	0.10	117.16	0.09	2245.74	0.09	197.92	0.08
70-80%	1451.73	0.12	136.71	0.10	2729.81	0.09	240.99	0.09
80-90%	1785.61	0.14	166.96	0.09	3562.57	0.10	302.96	0.07
90-95%	2291.90	0.08	208.55	0.08	4994.43	0.05	409.12	0.07
95-100%	4525.64	0.09	313.42	0.05	10279.41	0.04	669.61	0.05
All Classes	1278.94	1.00	113.59	0.06	2399.24	1.00	198.27	0.06

Source: Authors' calculations as part of report NITI Aayog, 2018

Table 4.A.3: Incidence of Income Taxes in India (Assessment Year 2014-15)

Average Gross Total Income(in INR)	F(Y)	T(Y)	T'(Y)
75000	0.08	0	0
184000	0.08	400	0.004
224000	0.22	4400	0.1
296000	0.21	11600	0.1
373000	0.06	19300	0.1
424000	0.05	24400	0.1
475000	0.04	29500	0.1
524000	0.04	34400	0.1
696000	0.13	53200	0.11
974000	0.01	108800	0.2
1204000	0.03	159200	0.22
1718000	0.01	313400	0.3
2224000	0.01	465200	0.3
3382000	0.01	812600	0.3
6888000	0.01	1864400	0.3
19234000	0.002	5568200	0.3
69078000	0.0002	20521400	0.3
151922000	0.0001	45374600	0.3
346746000	3.75943E-05	103821800	0.3

Source: Authors' calculations as part of report NITI Aayog, 2018

Chapter 5: Status of Key Fiscal Parameters on Resource Allocation

(TOR 5: Understand the current status on key fiscal parameters related to the resource allocation between Centre and states and further across states)

5.1 Fiscal Efficiency

One of important considerations for future FCs of India is to make use of incentive based fiscal efficiency criteria for tax devolution which were ignored by many past FCs. As explained in Chapter II, out 14 FCs that were there in India so far, only four of them have considered these criteria. Surprisingly, the last FC (14th FC) has totally ignored fiscal efficiency considerations. Fiscal efficiency indicators are normally identified as tax effort and fiscal discipline by FCs. Tax effort is measured by the ratio of a state's own tax revenue to state's income (GSDP), the higher being the tax effort of a state the higher is the ratio, given income. However, the interpretation of the tax performance has to be made in the specific context of a state. For instance, sectoral composition of GDP can influence the state's tax potential. States that have non-tax generating sectors like agriculture as major contributors to GSDP would show up as poorer performers. The relative position of states in terms of tax effort would be affected thereby. A poorer state with lower GSDP could have the same tax effort as a richer state where income is derived mostly from non-tax generating sectors. Therefore past FCs of India which considered tax effort as a criterion for tax devolution have suggested to multiply this ratio either by the inverse of per capita GSDP or the square root of inverse of per capita SDP. In this case, the poorer state with higher tax performance will get higher weight in comparison with a richer state with identical tax performance. Only the 10th, 11th and 12th FC had considered tax effort as one of the criteria for tax devolution while the 13th and 14th FCs did not use it as a criterion for horizontal devolution. Columns 2 and 3 of Table 5.1 provide estimates of tax effort (ratio of own tax revenue to GSDP) of Indian states for the financial years 2015-16 and 2016-17. For instance the tax effort varies from 2.3 per cent (Mizoram and Nagaland) to 8.7 per cent (Puducherry) among the states in the year 2016-2017. Poorer states Odisha and Bihar have comparable tax effort estimates to richer states of Goa and Maharashtra. However, in reality, the poorer states have performed better in terms of tax effort, given their lower income base. As per the rationale of past FCs, and for distributive justice towards rewarding efficiency, these states could lay claim to be given higher weightage for tax devolution. Only three FCs of India in the past (11th, 12th, and 13th) have

considered fiscal discipline as one of the criteria for tax devolution. Fiscal discipline of a state is measured as the ratio of its own tax revenue to its revenue expenditure and it is a measure of its improvement or change over time as a criterion for tax devolution. As already noted in Chapter 2, this change is measured by comparing this ratio of a past reference period (average of 3 to 4 years) to the average of 3 or 4 of most recent years. Columns 4 and 5 in Table 5.1 provide estimates of fiscal discipline (ratio of own revenue to revenue expenditure) for different states of India for the years 2015-2016 and 2016-2017. Comparison of estimates for two recent consecutive years given in Table 5.1 reveals a fall in the fiscal discipline ratio for many states with the exception of a few states. Moving ahead, the effect of tax reforms through the introduction of the GST, on the fiscal discipline of states will become evident over the next few years. There is a possibility that GST implementation could have a reducing effect on state's own tax revenue at least during the initial years.

The status of different states with respect to budgetary deficits (revenue and fiscal) is also an important indicator of fiscal discipline of states. The post devolution revenue and expenditure position of states is such that majority of states have resorted to debt financing of expenditures. Fiscal deficit level is higher in some states in the recent past as shown in Table 5.2.

Table 5.1 Estimates of Tax Effort and Fiscal Discipline for Different States of India for the Years 2015-2016 and 2016-2017

State	Per Capita GSDP (Rs.)2015-2016	Tax Effort(%) 2015-16	Tax Effort(%) 2016-17	Fiscal Discipline(%) 2015-16	Fiscal Discipline(%) 2016-17
Andhra Pradesh	69168.03	6.5	6.3	46.72	42.50
Arunachal Pradesh	134578.19	2.6	3.2	11.09	13.34
Assam	68080.52	4.5	4.7	34.71	33.29
Bihar	33473.36	6.7	5.4	33.05	27.59
Chhattisgarh	94090.95	6.5	6.5	51.01	51.10
Goa	360413.71	7.3	6.9	76.10	78.65
Gujarat	158071.32	6.1	5.6	76.05	74.87
Haryana	177990.33	6.4	6.2	60.24	58.80
Himachal Pradesh	156572.95	5.9	5.6	38.26	34.55
Jammu &Kashmir	87237.71	6.2	5.9	30.86	29.87
Jharkhand	64664.20	5.0	5.3	47.42	41.37
Karnataka	156436.75	7.5	7.3	69.13	67.28
Kerala	163844.92	7.0	6.9	60.26	56.95
Madhya Pradesh	67821.32	7.6	6.9	48.89	44.57
Maharashtra	167824.40	6.3	6.0	73.56	70.02
Manipur	61691.61	2.9	2.7	9.50	9.18
Meghalaya	79305.36	4.1	4.2	20.25	22.45
Mizoram	128551.06	2.3	2.3	11.78	12.95
Nagaland	100355.94	2.2	2.3	9.01	9.88
Odisha	74791.56	6.8	6.0	53.12	47.50
Punjab	133976.41	6.8	6.5	58.60	60.78
Rajasthan	92331.67	6.2	5.8	50.49	44.04
Sikkim	264295.06	3.3	3.5	26.88	29.15
Tamil Nadu	151976.78	6.9	6.6	63.40	62.57
Telangana	162168.08	7.0	7.5	71.66	71.46
Tripura	88505.28	3.9	3.5	20.27	18.76
Uttarakhand	162662.29	5.3	5.6	45.90	73.12
Uttar Pradesh	52064.86	7.2	7.0	49.00	62.32
West Bengal	100805.94	4.4	4.3	37.33	36.15
NCTof Delhi	302300.57	5.5	5.1	116.70	107.57
Puducherry	181842.57	9.0	8.7	64.29	66.81

Notes: Tax Effort is defined as ratio of state's own tax revenue to GSDP and fiscal discipline is defined as ratio of state's own revenue to states revenue expenditure

Table 5.2 Revenue Deficit/Surplus and Fiscal Deficit/Surplus as Percent of State's GSDP during the Years 2015-2016 and 2016-2017

	2015-16	2016-17	2015-16	2016-17
State	Revenue Surplus (-)/ Deficit (+) as a percentage of GSDP (in %)	Revenue Surplus (-)/ Deficit (+) as a percentage of GSDP (in %)	Gross Fiscal Surplus (-)/ Deficit (+) as a percentage of GSDP (in %)	Gross Fiscal Surplus (-)/ Deficit (+) as a percentage of GSDP (in %)
Andhra Pradesh	1.20	0.66	3.58	2.74
Bihar	-3.28	-1.88	3.16	5.14
Chhattisgarh	-0.91	-1.66	2.09	2.62
Goa	-0.24	-	2.73	-
Gujarat	-0.17	-0.30	2.25	1.75
Haryana	2.41	2.23	6.49	4.27
Jharkhand	-1.77	-2.32	4.98	2.69
Karnataka	-0.18	-0.09	1.89	2.13
Kerala	1.73	2.26	3.19	3.80
Madhya Pradesh	-1.08	-0.24	2.65	4.68
Maharashtra	0.27	0.63	1.42	2.22
Odisha	-3.06	-1.92	2.13	3.22
Punjab	2.18	2.66	4.43	13.89
Rajasthan	0.87	2.35	9.22	6.28
Tamil Nadu	1.03	1.19	2.81	4.72
Telangana	-0.04	-0.03	3.26	3.39
Uttar Pradesh	-1.28	-1.99	5.22	4.46
Arunachal Pradesh	-10.72	-10.56	-0.93	0.41
Assam	-2.41	-	-1.33	-
Himachal Pradesh	-1.01	0.75	1.91	4.21
Jammu and Kashmir	0.54	-	6.77	-
Manipur	-4.68	-	1.77	-
Meghalaya	-2.70	-1.37	2.12	3.48
Mizoram	-7.24	-	-2.67	-
Nagaland	-2.32	-	3.03	-
Sikkim	-0.83	-3.50	3.07	2.92
Tripura	-4.54	-	4.80	-
Uttarakhand	1.05	0.02	3.49	2.31

Source: Authors' calculations based on data from RBI state budgets which has been sourced from State Government Budgets and CAG for Jammu and Kashmir

Note: Revenue deficit and gross fiscal deficit data for 2015-16 are based on actuals (accounts), while data for 2016-17 are based on revised estimates. GSDP is Gross State Domestic Product at Factor Cost measured in current prices and is from the Base 2011-12 series.

5.2 Tax Effort of States: An empirical analysis

In this section, we analyse data from 2004-2005 till date to better understand the relationships between tax effort and state GSDP. A three step approach is adopted: a literature review, a descriptive data based analysis and estimates from an econometric model.

5.2.1 Key Insights from a desk review

We present below findings on some key aspects that have implications for the fiscal positions of states, and are intertwined with scholarly arguments presented in response to the recommendations of the past two FCs.

Revenue Deficit, Direct Transfers, Plan and Non-Plan expenditure, and Grants

The 14th FC's recommendations constituted a substantial change over prior FCs. A substantially enhanced tax devolution implied an increase in general purpose transfers (Rao, 2017). A highlight of the 14th FC's recommendations was the removal of the element of direct transfers. The consideration of the entire pool of revenue as against the earlier consideration of plan and non-plan elements separately, suggests that a sufficient size should have been received by the states (Dholakia, 2015). However, the reduction in specific purpose FC grant offsets the increase in general transfers (Chakraborty and Gupta, 2016), and it is assessed that a one percentage point increase in general purpose transfer was countered by an equivalent reduction in allocation to Central Schemes (Rao, 2017). The 14th FC also provided revenue deficit grants to support the states with low-per capita expenditure, while it made sure (by normalizing the expenditure) that only states in need are benefitted (Bhaskar, 2015). While some state budgets in fact show similarity in need of revenue deficit grants as projected by 14th FC, for some other states it implied an overly pessimistic outlook (Bhaskar, 2015).

After doing away with special and non-special category of states in 14th Finance Commission, the FC in fact considered specific disabilities and requirements, and hence decided to give post-devolution revenue deficit grants (Dholakia, 2015). Additionally, the 14th FC also estimated the revenue and expenditure of each state to estimate pre- and post-devolution deficits. This approach has been criticized because it gives rise to perverse incentives on the part of states.

Also, by removing certain specific grants and replacing them by unconditional grants on the pretext of underutilization of resources, it is argued that the approach has restricted the flow of resources in a desired direction, specifically in education, health or maintenance purposes. It is further argued that states might even become apathetic to the idea of being penalized by not meeting the specific conditions of expenditure on a specific sector.

On the other hand, enhancing transfers made within the formula based transfers has been advocated by researchers. (Reddy and Reddy, 2019). It is also been felt that experience from the past indicates that placing stringent conditions in order to be eligible for state-specific grants as in the 13th FC, has impinged upon the states' fiscal autonomy (Chakraborty, 2010). For instance, the grant for elementary education was based on the condition that the states should be experiencing 8% growth in education spending, whereas actual all-states growth was about 14%. This it is argued can create perverse incentives to decrease the expenditure on the education.

- **Impact of GST**

The earlier FCs had been of the opinion that there was a lack of details available on GST, which had not been adopted or finalized at the time, and hence felt unable to check its impact on finances of the Centre or states. However, despite the ambiguity surrounding it, some scholars had been studying the issue. There has been a broad consensus built around the positive pay-off of GST (Dholakia, 2015). Plausible assumptions and trust in the gradual realization of its benefits lead to this conclusion. Having said that, post introduction of the GST, GST revenues are not reaching the expectations and opinions were expressed on possible reforms, including the need for estimating its impact on revenue generations and other factors (for instance, Bhaskar, 2018). A further apprehension is about the provision of compensation that exists for the states which are not able to meet the revenue target of 14%, and whether this can consequently reduce the incentives for such states to deepen or widen the tax base.

- **Fiscal Discipline**

It had been earlier argued that the horizontal devolution formula designed by the 13th FC had two components with contrary implications. These were the components of fiscal capacity distance (which increases spending incentives by the states) and fiscal discipline (limits the expenditure), which were deemed to be in conflict and penalized states twice on the same basis (Chakraborty,

2010). The 14th FC did away with giving a weight to fiscal discipline in the devolution formula, arguing that there has to be trust between the states and the Centre, and that states should be able to manage their fiscal problems on their own. However, an alternative view that has been expressed to this approach is that it may cause incentives to drive in the opposite direction, leading states to practice fiscal profligacy (Dholakia, 2015).

- **Fiscal Federalism**

The idea of fiscal federalism is much broader than that of encouraging fiscal prudence. True federalism implies ensuring vertical and horizontal balance between the Centre and States, such that the fiscal autonomy of states is promoted. The states and the Centre should also be equal partners in the affair of development (Chakraborty, 2010). It was broadly agreed that earlier FC recommendations limited the fiscal autonomy of the states while the 14th FC made substantial efforts to address some of the concerns in this regard. As pointed out by Bhaskar (2018), despite following the fiscal consolidation path as suggested, at no point in time have all the states simultaneously reported zero revenue deficits. Scholars also point out that the condition that states have to meet a particular condition in order to be able to borrow the money persists due to various reasons (Bhaskar, 2018; Reddy, 2018). The transfers from the FC have also been considered to be more equalizing in their impact than the transfers through the Central schemes, although the FC transfers it is felt only partially offset the revenue disabilities of low income states (Rao 2017).

Other issues linked to TORs:

The TOR of the 15th FC suggests reviewing the enhanced tax devolution given to states under 14th FC¹⁰. The terms of reference (ToR) for the 15th FC states that commission would take into account the potential and fiscal capacity of state and central government for tax and non-tax revenues. In this context, two aspects have been noted in recent papers.

Performance based incentives

In the context of fiscal federalism, the provision for performance based incentives, as proposed in the ToR of 15th FC need to be well thought out. On one hand these have been considered to being biased towards the Centre, challenging thereby the idea of fiscal federalism, along with similarly articulated needs of the Centre for resources. On the other hand, there are practical aspects such as induction of appropriate funds in the prioritized fields, developing the

¹⁰https://fincomindia.nic.in/writereaddata/html_en_files/fincom15/TermsOfReference_XVFC.pdf

performance measure and ensuring that it allows for comparability across space and time. It may logically also lead to change in the behavior of spending by states (Reddy, 2018) .

New India 2022

The “New India 2022” program has been initiated by the central government to impact welfare through various means and sectors such as agriculture, health, education, poverty, gender, caste, terrorism, corruption, sanitation, infrastructure, among others. The New India 2022 program would require setting up of various state and central government schemes, and also delegating the supervision of such schemes which will have to be carried out through state governments. The program would have implications for state finances and at the same time implies a need for funds if these are to be implemented through Central government schemes. The latter could imply a decline in the vertical devolution to states while the former could impact horizontal devolution in terms of criteria used.

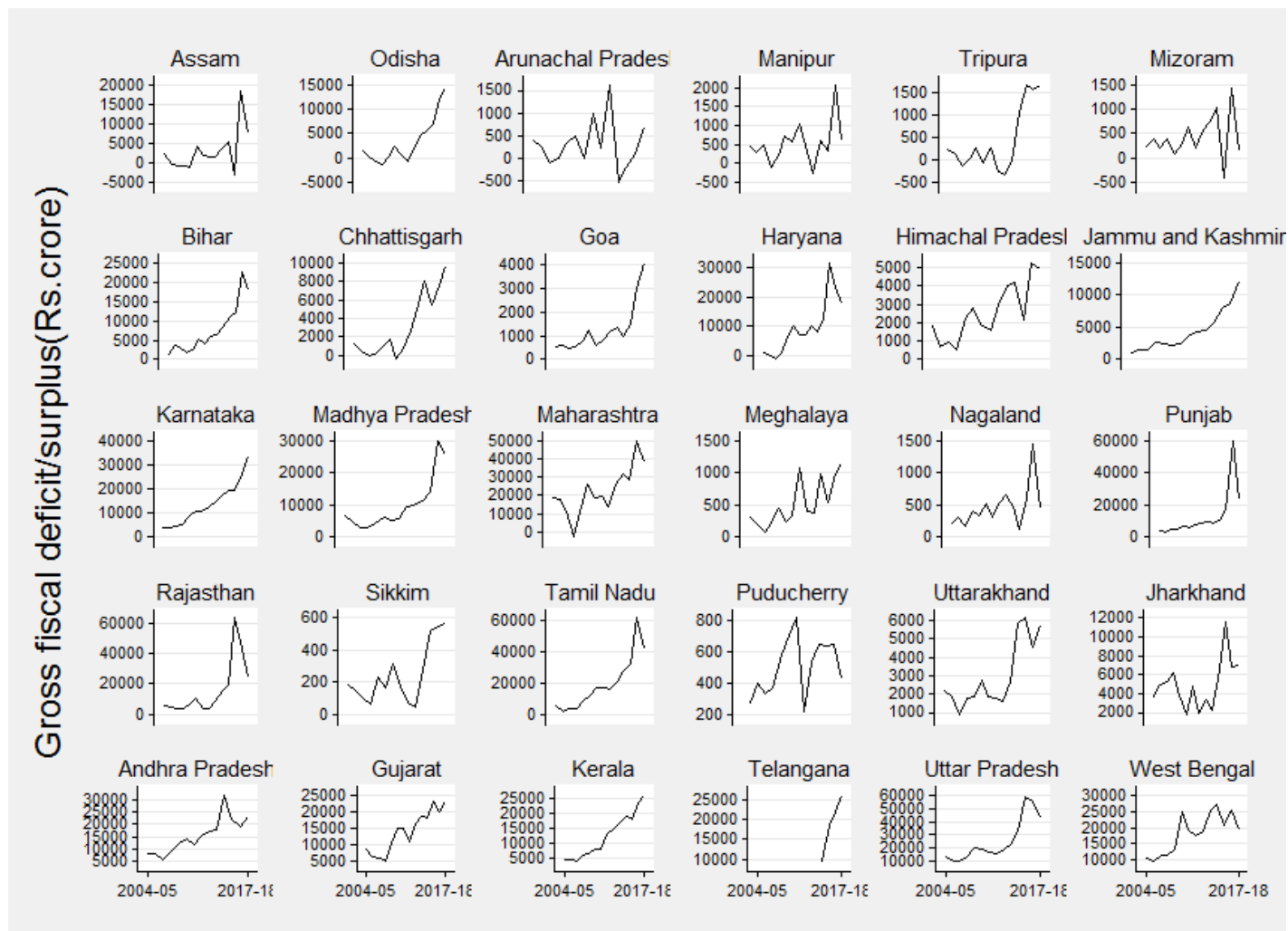
5.2.2: Trends in States Own tax Revenue and Fiscal Deficit

To further understand the tax performance of states, we look at the historical trends in own tax revenue (OTR) and its relationship with the devolution made across FCs. Theoretically, the own tax revenue can be a reflection of the state’s ability to raise revenue through taxation, which in turn depends on several factors such as the state’s NSDP, the structure of taxes, and the sectoral composition of NSDP. The NSDP in general is taken as a major determinant. . It has been argued in the literature that there may be a tendency towards fiscal profligacy, either in terms of expenditures or in terms of lower tax efforts, if states receive higher proceeds from the Centre. This line of thinking promotes the inclusion of an indicator to reflect tax performance in balancing resource allocation across states. However, others argue that there is not much empirical evidence to support this.

While 19 out of the 29 states studied display an overall upward trend in the fiscal deficit, even these states do not consistently have a deficit during the entire period studied from 2004-05 to 2016-17 (Figure 5.1). For most states, there is an increase post 2013-14, however, for some of them it reduces later. There is no clear correlation across states which would indicate higher deficits corresponding to a particular FC award period. As a percentage of NSDP, there is no

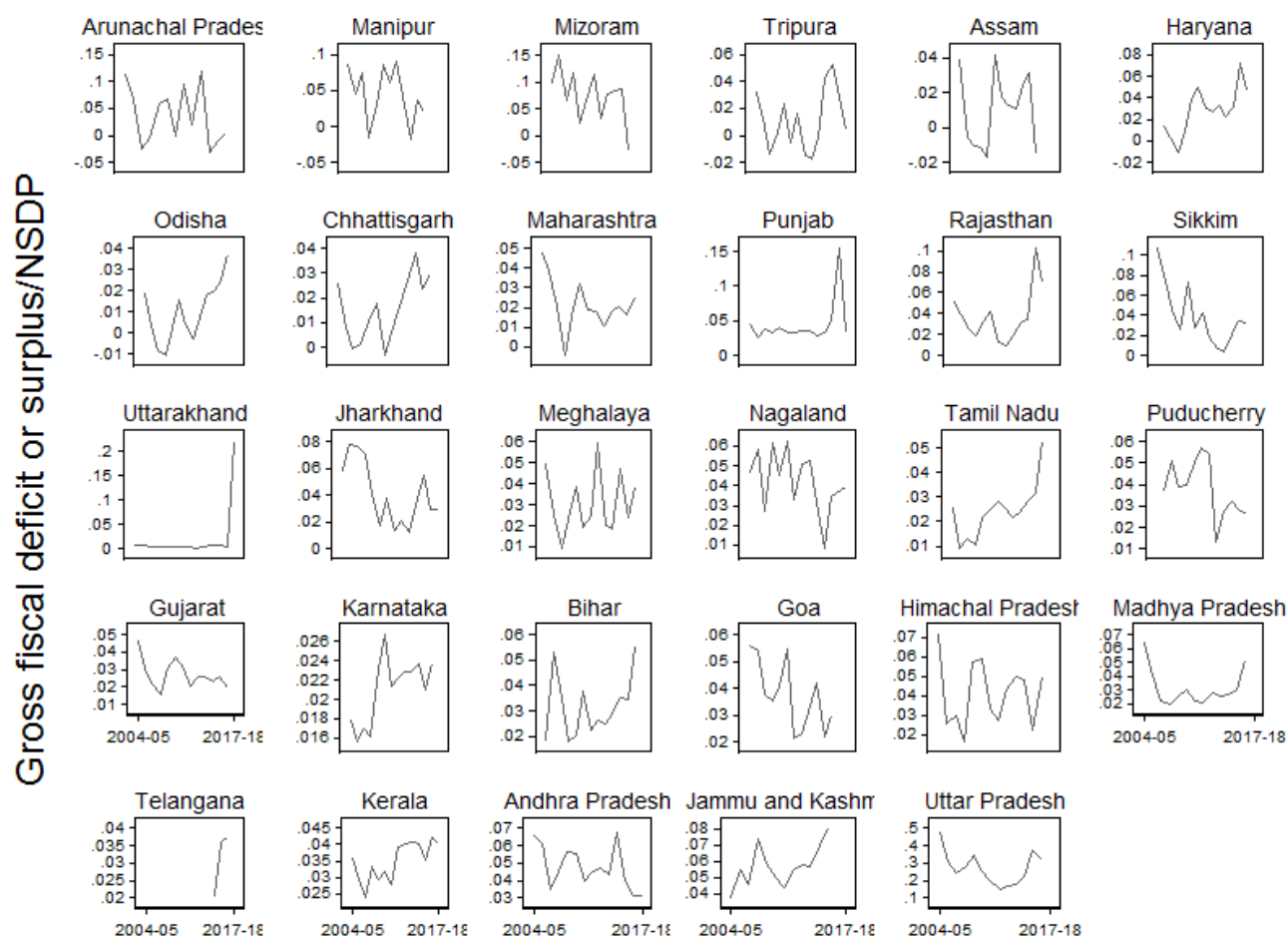
observable increase in fiscal deficit in general. In majority of the states it is currently at 3% or less as a percentage share of NSDP (Figure 5.2). In about half of the remaining states it fluctuates around 4%.

However, since states have some discretion for raising public debt within certain limits for public spending, budgetary deficits of states need not be related to states per capita GSDP. Therefore, it could be useful from fiscal discipline point of view if future FCs could consider the fiscal deficit as one of the criteria for ensuring that states make efforts to contain fiscal deficits and exercise prudence in use of their discretionary power for debt financing of their budget.

Figure 5.1 Gross fiscal deficit- absolute values

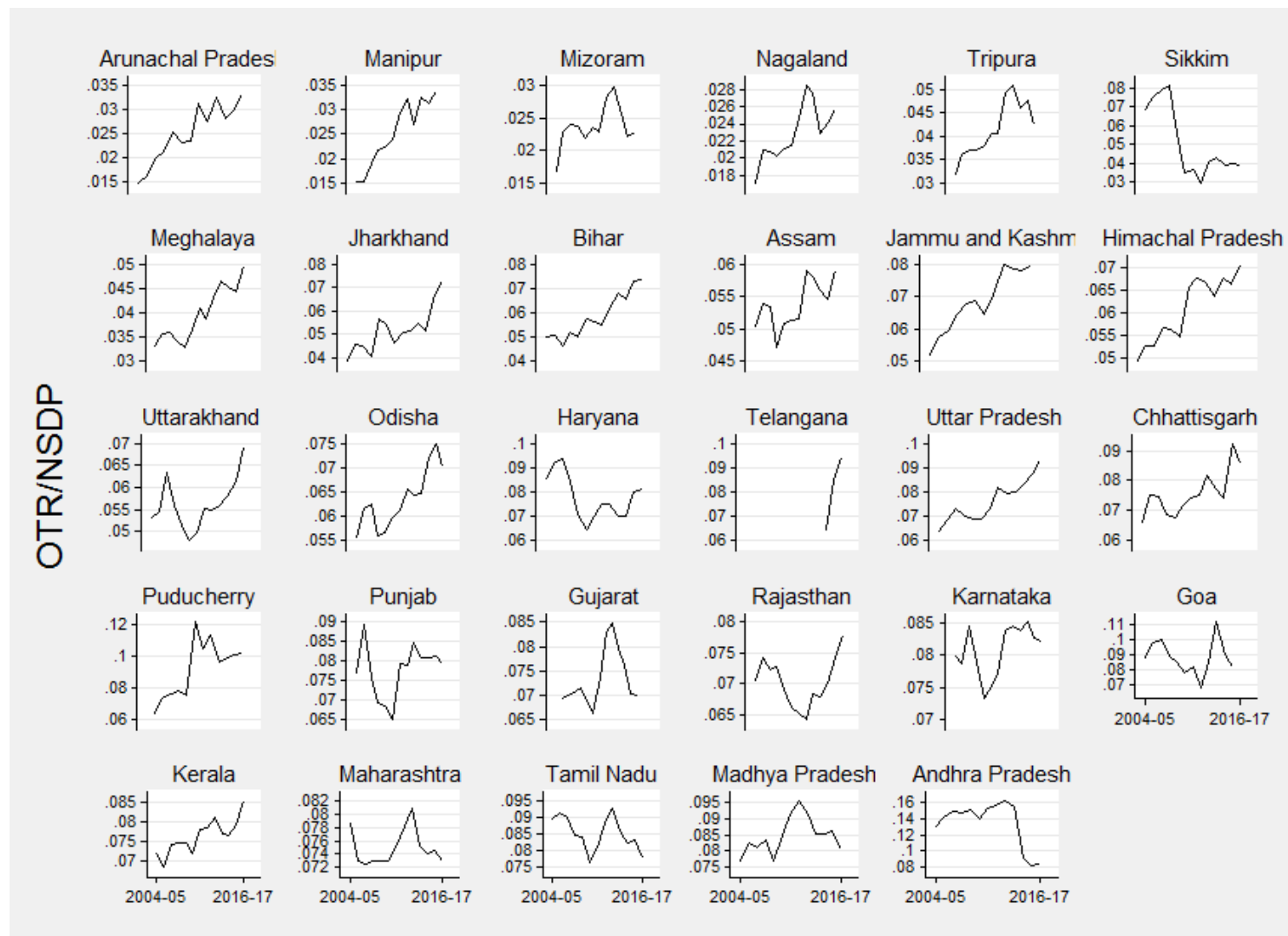
Source: Authors' compilations based on RBI State Finances which was taken from State Budgets and CAG in the case of Jammu and Kashmir

Notes: Gross fiscal deficit/ surplus- deficit measured as positive, surplus measured as negative. These are absolute values measured in nominal terms. Data for the year 2004-05 to 2015-16 are Accounts (or actuals as recorded in accounts) while data for 2016-17 are revised estimates and data for 2017-18 are budget estimates. They are all measured in Rs. Crore.

Figure 5.2 Gross fiscal deficit/ NSDP (current)

Source: Authors' calculations based on RBI State Finances for NSDP and Fiscal Deficit data. Fiscal deficit data of the RBI was taken from State Budgets and CAG in the case of Jammu and Kashmir while NSDP data of the RBI was taken from CSO.

Notes: Gross fiscal deficit/ surplus- deficit measured as positive, surplus measured as negative. They are taken as a ratio of NSDP measured in current prices. For fiscal deficit, data for the year 2004-05 to 2015-16 are Accounts (or actuals as recorded in accounts) while data for 2016-17 are revised estimates and data for 2017-18 are budget estimates.

Figure 5.3 Own Tax Revenue (OTR)/NSDP across states from 2004-05 to 2016-17

Source: Authors' calculations based on data from RBI state finances

Note: Both Own Tax Revenue (OTR) and NSDP are measured in nominal/current terms and in Rs. Billion.

Own Tax Revenue (OTR)/NSDP across states from 2004-05 to 2016-17

Trend analysis of data on OTR as a proportion of NSDP from Figure 5.3 reveals that for most states during the study period there is a clear upward trend, although there have been years in between when the ratio has dropped. In some of the states in South and West (Gujarat, Maharashtra, Madhya Pradesh, Goa, Tamil Nadu, Andhra Pradesh) and in the North East, significant declines are seen post 2014-2015. A rather mixed picture emerges, both across states and time. Hence, we attempt an econometric analysis to further examine the data.

5.2.3 Results from econometric analysis: Tax Performance, NSDP and Devolution from FCs

A set of panel fixed effects regression models were estimated to explore the relationships between tax performance and devolution to the States. The period of analysis includes data for three devolution periods – from 12th to 14th FC, from 2004-05 till 2016-2017. We present the findings below.

Own tax revenue (in nominal and absolute terms) is inelastic with respect to changes in the net devolution¹¹. If the devolution increases the OTR increases less than proportionately. The coefficient is positive, less than 1 and is statistically significant. However, higher share in the devolution has been negatively associated with OTR collections during the period studied. Further, adding dummies for the three FC periods reveals that the 13th and 14th FC periods were associated with a positive impact on OTR irrespective of whether one controls for an impact of increase in the per capita NSDP or not. There is a positive and significant correlation between per capita NSDP and the FC period dummies which could be responsible for the dummies not being significant when per capita NSDP is included in the estimation. Per capita incomes in states are correlated positively with per capita OTR.

Thus, though higher devolutions are not associated with higher fiscal effort, there does not seem to be sufficient evidence to establish that the introduction of fiscal discipline in the earlier FCs, led to higher OTR as compared to the later FC period. We also note that in per capita terms, OTR is positive and elastic with respect to per capita NSDP, indicating that a change in NSDP leads to more than proportionate increase in tax collections. One explanation for this could be that income inequality is increasing with increase in (per capita) income in the states, leading to a more than proportionate increase in OTR per capita, with higher earnings among people who were already existing tax payers, or those moving up across tax brackets. Details have been given in Table 5.3.

¹¹ The net devolution amount (in absolute values) is defined as gross devolution and transfers minus repayments of loans to Centre and interest payments on loans from Centre.

Table 5.3: Regression estimates

Specification (All are run as panel fixed effect models)	Per capita NSDP	Ln(Per capita NSDP)	Devolution share	Ln(Net Devoluti on)	Dummy -13 th FC	Dummy- 14 th FC
Ln OTR(nominal)= f(Ln Net Devolution)	-	-	-	0.90***	-	-
OTR (nominal) = f(Devolution Share)	-	-	(-)44.81*	-	-	-
OTR (nominal) = f(Devolution Share, 13 th FC Dummy, 14 th FC Dummy)	-	-	(-)54.07***	-	94.6***	140.6***
OTR(nominal) = f(Per Capita NSDP(current) Devolution Share, 13 th FC Dummy, 14 th FC Dummy)	0.002***	-	(-)47.21***	-	16.61	8.88
Per Capita OTR (nominal) = f(Per Capita NSDP (current))	0.07***	-	-	-	-	-
Ln Per Capita OTR (nominal) = f(Ln Per Capita NSDP (current))	-	1.16***	-	-	-	-

Legend: ***- p<0.01, **- p<0.05, *- p<0.1, If p>0.1- insignificant. All outliers beyond Mean+/-2SD were removed.

Source: Authors' estimations based on data from RBI state budgets

5.3 Looking Ahead: Tax Reforms and Goods and Service Tax

Introduction of goods and service tax (GST) as a major commodity tax reforms in India has implications for tax revenue collected by states and centre. The 14th FC has looked in to this problem and could not assess the changes in revenues of centre and states because GST was yet to be implemented at that time. Currently, as the GST tax regime has been in full operation for a couple of years the 15th FC has to consider the changes it brought in and fiscal imbalance caused in centre and state finances. However, 14th FC noted that introduction of GST may cause some revenue losses to states initially for a few years and therefore some mechanisms have to be considered for compensating the states for these losses. However, it is too early to make any predictions about the extent to which the past trends of tax revenue of states and centre are altered by this important tax reform. GST is expected to have a positive effect on central and state revenues in the long run due to the increased tax base and transparency and reduced tax evasion in comparison to earlier commodity tax regimes in India. It avoids fiscal competition among states with better coordination between states and centre in fixing the GST rates (for

example the current GST Council in India). The more pertinent problem of concern to states arises because GST is a destination based tax. It is a worry to more industrialized states like Gujarat, Maharashtra, Tamil Nadu etc because goods produced in these states are consumed elsewhere in the country yielding tax revenue to jurisdictions in which they are purchased and used. Therefore, FCs have to assess the effects of GST regime on revenue collection by states and the centre before making the recommendations for tax devolution for correcting vertical fiscal imbalance between centre and states and horizontal imbalances among states.

Chapter 6: Emerging concerns in horizontal and vertical devolution

(TOR 6: Highlight the major emerging concerns in resource devolution with specific reference to merits and demerits of criteria used for vertical and horizontal balances)

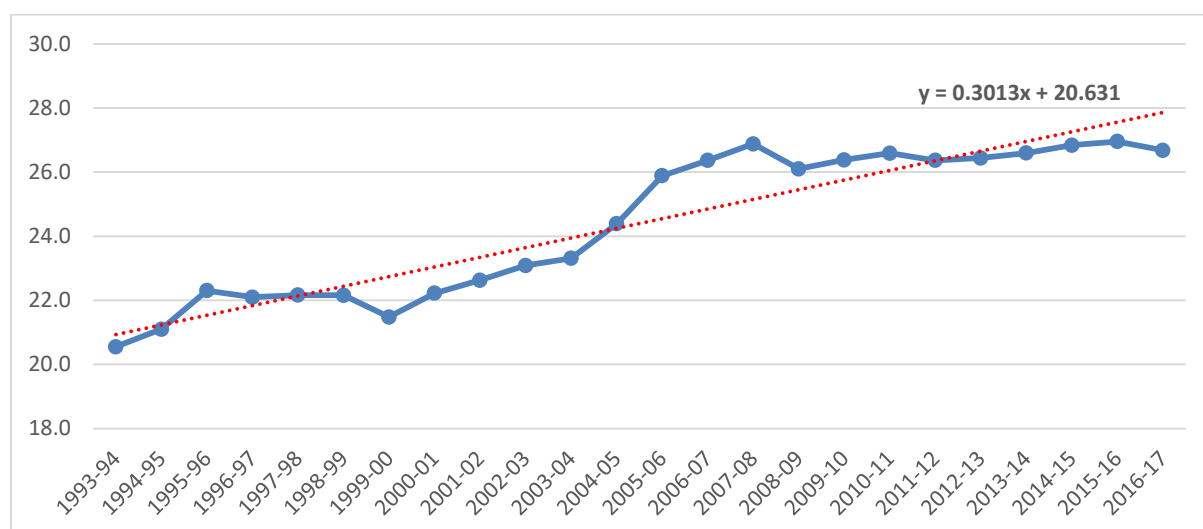
Reducing inequality and poverty eradication are two major goals for the Indian government. These are also two of the important Sustainable Development Goals, among many others which India is committed to achieve by 2030. Studies indicate that absolute poverty has substantially gone down aided by various policies, while inequality in terms of the distribution of consumption in the economy has increased.

While it might be debatable whether Finance Commission should get involved in consideration of inter-personal or intra-state inequality, consideration of inter-state inequality may be a natural concern of the Commission. There is wide difference in average level of living across states in India. For example, per capita income of Goa at Rs. 375500 is 11 times that of Bihar at Rs. 34400 in the year 2016-17. The difference between the highest per capita income and the lowest has risen from 6.5 in 1993-94 to 11 in 2016-17.

The Gini coefficient captures the inequality among various subgroups (states in our case) in a society considering the per capita income and the proportion of population of different subgroups. The higher the coefficient, the higher the inequality across subgroups. The Gini coefficient in per capita GSDP of the states in India has shown an increasing trend over time. As Figure 6.1 shows it was in a small range of 20 to 22 during 1993-94 to 1999-2000, but has increased thereafter to about 27 in 2016-17.

In view of the rise in inter-state inequality, one could consider using a normative welfare approach for resource transfers which takes into account the preferences for income redistribution in favour of the poorer states¹². This implies computing distributional weights for the income of people belonging to different states in India incorporating an inequality aversion parameter (ϵ) (see, Note 6.A.1 in Appendix for a theoretical formulation).

¹² See, Murty and Nayak (1994) for detailed methodology.

Figure 6.1: Gini Coefficient in per capita GSDP

The logic of using such an approach lies in the reasoning that thereby relatively poorer states get higher percentage shares as compared to the past approaches in per capita income rule. Thus, from an all India perspective, transfers to less developed regions will be welfare improving. To elaborate further, the social value of income (transfer) to a representative individual from Bihar, the poorest state, would be much higher than the income of an individual belonging to the richest state, Goa. It follows that by this rule, the shares of the poorer states in Central transfers would increase while that of the better off states will reduce. This may be considered as an alternative criteria, towards enhancing the equity criteria in terms of outcomes.

Some variation of per capita income of states has been a criteria used by most commissions. In Table 6.1, we demonstrate how the shares for individual states will differ when inequality aversion parameter (e) takes values 1.0, 1.2 and 1.5. A higher value of e signifies higher inequality aversion. See, Appendix to this chapter for theoretical formulation). With increasing inequality aversion, states like Assam, Bihar, Jharkhand, MP and UP gain while states at the top end such as Goa, Gujrat, Haryana, and Maharashtra lose. We may note that the results are quite sensitive to the value of e .

Table 6.1. Shares of Different States in the Amount of Transfer for 2016-17(In Percentage).

States	Per capita NSDP 2016-17	Population Share	Percentage share of different states in tax devolution based on 1/Per capita NSDP when e=1.00	Percentage share of different states in tax devolution based on 1/Per capita NSDP when e=1.20	Percentage share of different states in tax devolution based on 1/Per capita NSDP when e=1.50
Andhra Pradesh	124401	0.0416	2.62	2.04	1.31
Arunachal Pradesh	119150	0.0012	0.08	0.03	0.01
Assam	67303	0.0262	3.04	2.45	1.64
Bihar	34409	0.0874	19.86	23.28	27.37
Chhattisgarh	81808	0.0215	2.05	1.53	0.91
Goa	375550	0.0012	0.03	0.01	0.00
Gujarat	156527	0.0508	2.53	1.97	1.25
Haryana	165491	0.0213	1.01	0.65	0.31
Himachal Pradesh	149028	0.0058	0.30	0.15	0.05
Jammu & Kashmir	78163	0.0105	1.05	0.69	0.33
Jharkhand	59799	0.0277	3.62	3.02	2.13
Karnataka	161922	0.0513	2.48	1.91	1.21
Kerala	163475	0.0281	1.34	0.92	0.48
Madhya Pradesh	74787	0.0610	6.37	5.95	4.98
Maharashtra	165491	0.0944	4.46	3.87	2.91
Manipur	57888	0.0024	0.32	0.17	0.06
Meghalaya	72870	0.0025	0.27	0.13	0.04
Mizoram	128241	0.0009	0.06	0.02	0.00
Nagaland	90168	0.0017	0.14	0.06	0.02
Odisha	74234	0.0353	3.71	3.11	2.21
Punjab	129321	0.0233	1.41	0.97	0.52
Rajasthan	89678	0.0576	5.02	4.47	3.48
Sikkim	270572	0.0005	0.01	0.00	0.00
Tamil nadu	150036	0.0606	3.16	2.56	1.73
Telangana	160062	0.0294	1.44	0.99	0.53
Tripura	91266	0.0031	0.26	0.13	0.04
Uttar Pradesh	50942	0.1678	25.74	31.78	40.41
Uttarakhand	157643	0.0085	0.42	0.23	0.08
West Bengal	83126	0.0767	7.21	6.90	5.99

Note: If we denote Y_i as Per Capita NSDP 2016-17. Where $i = 1, 2, \dots, 29$ denotes different states. Then, weight of individual states are calculated for different epsilon (e) value by formula:

$$\text{Share of individual states} = \frac{\bar{Y}/Y_i}{\sum_{i=1}^{29} \bar{Y}/Y_i}, \text{ where, } \bar{Y} = \frac{1}{n} \sum_{i=1}^{29} Y_i$$

6.2. Integrating Population Stabilization Indicator in Finance Commission Transfers

Among other considerations, the Terms of Reference (TOR) of the 15th Finance Commission (15th FC) calls for proposing measurable performance-based incentives for the States based on their efforts and progress in moving towards replacement rate of population growth. Presumably, this implies rewarding States for progressing towards a stationary population which in demographic parlance refers to an indefinite continuation of a constant number of births, a constant life table and zero migration at all ages (Preston et al, 2001). In spirit, the concerned TOR reflects the overwhelming concern associated with increasing population and emphasises on the urgency to a constant population in near future. The process - also referred to as population stabilization – is consistent with development policymaking and has been a prime focus of several national and international organizations (Srinivasan, 1998, Zodgekar, 1996).

It is critical to view this TOR along with the mandate for the 15th FC using the population data of 2011. It may be noted that some of the states lagging in population stabilization are also the ones with high share of population. In other words, states that have performed well in reducing natural increase (net births) in population are likely to be disadvantaged if the formulae for horizontal resource sharing is governed by 2011 population instead of 1971 base. Importantly, population shares are used to weigh all the constituents of the horizontal transfer formulae. Consequently, this particular TOR has generated considerable debates and disagreements, particularly among the South India states who are almost set to be the net losers (Bhaskar, 2018, Reddy, 2018). While the mandate of 15th FC is to use 2011 population, it has considerable scope to decide upon the net impact of the population criteria on horizontal transfers. In fact, the 14th FC had used 2011 population in conjunction with 1971 population to arrive at a formulae for population based transfers.

Nevertheless, the 15th FC can conceive an indicator of population stabilization that can be used to build in incentives (disincentives) for states that have (have not) achieved significant reductions in population growth. Incentivizing good performance in population stabilization would be viewed as an additional move that rewards progress and motivates states to move towards stable population. Given the backdrop, this section is concerned with devising an indicator and weighing mechanism based on state level performance in population stabilization.

Population Stabilization

At the outset, we briefly outline the concept of population stabilization. Essentially, it refers to constant birth rates and constant death rates in the specific age structure of a population over a period of time (Preston et al, 2001). More specifically, a population will be termed to attain stability if it achieves replacement level of fertility which is 2.1. However, it is difficult to determine the time period over which the population might stabilize because of variability in age-specific birth and death rates. The process is dependent upon a number of factors and assumptions. The key characteristic which could decide the course of stabilization is the age structure of the population which in turn is determined by the demographic transition taking place in the society. As such, demographic transition refers to transition from high birth and death rates to lower birth and death rates. Overtime it is expected that both birth and death rates decrease with socioeconomic progress.

Notably, population stabilization is a special case of zero population growth. There is a difference when the population grows at a *zero* rate and when the population growth is *constant*. Also, the effect of migration cannot be ignored which also influences the rate of growth of population (Bhagat & Mohanty, 2009). To elaborate, if immigration is high in a region, then population will grow even though the birth and death rates are constant. Another factor is the sex ratio. In patriarchal societies the preference for son might make a couple opt for a larger number of children to ensure at least one male child which could contribute to higher population growth (Johnson, 1994).

The concept of population stabilization should receive more attention in case of India given the challenging situation with respect to population growth and development (James, 2011). In the past, the focus in case of India has always been on reducing birth rate to control the population. The final draft of first five year plan had advocated the need to reduce the birth rate. The Third Five Year Plan focused on the provision of sterilization services in health care facilities to control population. In 1976, the government of India came up with its first National Population Policy and assigned topmost priority to bring down fertility to control the growing population (Donaldson, 2002). Prior to the first policy it was believed that education and development will lead to a decline in population growth. However, the first policy noted that this was not a feasible option. Coercive means were used to achieve lower population growth but the new government formed in 1978 steered clear of these practices.

The issue of population stabilization did not resurface formally till the government came up with the second population policy in 2000. The mid-term objective of the second population policy was to bring total fertility rate (TFR) to 2.1 children per women, which is considered as the replacement level. TFR is defined as the mean number of births to a woman who completes her reproductive life and undergoes the same current age-specific fertility patterns over her lifetime. The long term objective in second population policy was to achieve population stabilization by the year 2045. Use of fertility rate as a policy indicator is desirable because fertility determines the overall birth rate in the society and it is not the other way around because the latter is also influenced by population changes due to migration and survival patterns. Also, the trends and patterns in fertility outcomes could be monitored. In other words, it is easier to calculate fertility and observe the change in trends and patterns as compared to other indicators such as migration, crude birth rate and crude death rate. The Population (Stabilization) Bill 2017 introduced in the Rajya Sabha also focuses on schemes which encourage two-child norm. Therefore, TFR seems to be an ideal indicator to proxy the efforts and outcomes associated with population stabilization.

Deriving TFR-based Weights

We estimate the share that could be allotted to different States based on the TFR. Data for TFR is sourced from the National Family Health Survey 2015-16 which is conducted by the International Institute for Population Sciences, Mumbai under the Ministry of Health and Family Welfare. The idea is to incentivize the States with low TFR. For this purpose, we suggest a method involving the following 4 steps:

- 1) The inverse of the TFR value ($1/\text{TFR}$) for each State has been computed.
- 2) This proportion is now divided by the sum of all the inverse values to arrive at normalized figures.
- 3) The normalized values are weighted by using the population shares from Census 2011, and
- 4) Values in step (3) is re-normalized to derive the TFR based weights for horizontal transfers across states (Table 6.2).

Table 6.2 TFR-based weights for Indian states for population stabilization component based on normalized population weighted inverse TFR analysis

States	TFR 2015-16	Population Share 2011	Normalized (1/TFR)	TFR-based Weights (%)
Andhra Pradesh	1.83	0.041	0.038	4.80
Arunachal Pradesh	2.10	0.001	0.033	0.10
Assam	2.21	0.026	0.031	2.48
Bihar	3.41	0.087	0.020	5.36
Chhattisgarh	2.23	0.021	0.031	2.00
Goa	1.66	0.001	0.042	0.13
Gujarat	2.03	0.051	0.034	5.34
Haryana	2.05	0.021	0.034	2.20
Himachal Pradesh	1.88	0.006	0.037	0.68
Jammu and Kashmir	2.01	0.011	0.034	1.15
Jharkhand	2.55	0.028	0.027	2.33
Karnataka	1.80	0.051	0.038	5.97
Kerala	1.56	0.028	0.044	3.79
Madhya Pradesh	2.32	0.061	0.030	5.64
Maharashtra	1.87	0.094	0.037	10.71
Manipur	2.61	0.002	0.027	0.17
Meghalaya	3.04	0.002	0.023	0.14
Mizoram	2.27	0.001	0.031	0.10
Nagaland	2.74	0.002	0.025	0.15
Odisha	2.05	0.035	0.034	3.66
Punjab	1.62	0.023	0.043	3.05
Rajasthan	2.40	0.058	0.029	5.18
Sikkim	1.17	0.001	0.059	0.18
Tamil Nadu	1.70	0.061	0.041	7.70
Telangana	1.78	0.030	0.039	3.60
Tripura	1.68	0.003	0.041	0.38
Uttar Pradesh	2.74	0.168	0.025	12.94
Uttarakhand	2.07	0.008	0.033	0.81
West Bengal	1.77	0.077	0.039	9.25
All India	2.18	1.000	1.000	100.0

Source: Authors computation based on NFHS 2015-16 and Census of India 2011

Table 6.2 presents the distribution of TFR across the 29 States as reported in NFHS-4. There is a wide variation in TFR figures with the highest value being 3.41 in case of Bihar and lowest being 1.17 in Sikkim. As many as 11 out of 29 States have a TFR which is greater than 2.1. This means a majority of the States have been able to bring TFR below the replacement level of 2.1. The highest TFR is observed in Bihar (3.41) followed by Meghalaya (3.04), Nagaland (2.74) and Uttar Pradesh (2.74), while the lowest TFR levels are observed in Sikkim (1.17), Kerala (1.56) and Punjab (1.62).

Table 6.2 also presents the population share of India's States. These figures are based on data from Census of India (2011) and does not include the population of Union Territories while estimating the population shares. The highest population share among states population is of Uttar Pradesh (16.8 per cent), followed by Maharashtra (9.4 per cent) and Bihar (8.7 per cent). Bulk of the population is concentrated in only few States. Interestingly, more than 50 per cent of India's population reside in Uttar Pradesh, Maharashtra, Bihar, West Bengal, Tamil Nadu and Madhya Pradesh. The population share of most of the North-eastern States such as Arunachal Pradesh, Sikkim, Manipur, Meghalaya, Mizoram, Nagaland and Goa is quite low. The combined population share of these States is even less than 1 per cent. The wide variation in population of the regions is influenced by a number of factors such as area, TFR levels in the past, birth rate, death rate and migration to name a few.

The Pearson's Correlation coefficient between TFR and population share was computed to measure the strength and direction of linear association between the two variables. The limits for the correlation coefficient are from +1 (perfect positive correlation) to -1 (perfect negative correlation). A value of 0.238 was obtained which indicates almost no correlation between the two variables. The estimate make a lot of sense since it is observed from the data that even though the population share of UP is high but its TFR is 2.74 which is lower than Bihar's TFR (3.41). Similarly, the TFR of Meghalaya (3.04) and Nagaland (2.74) are high but the combined share of population of these States is not even 1 per cent.

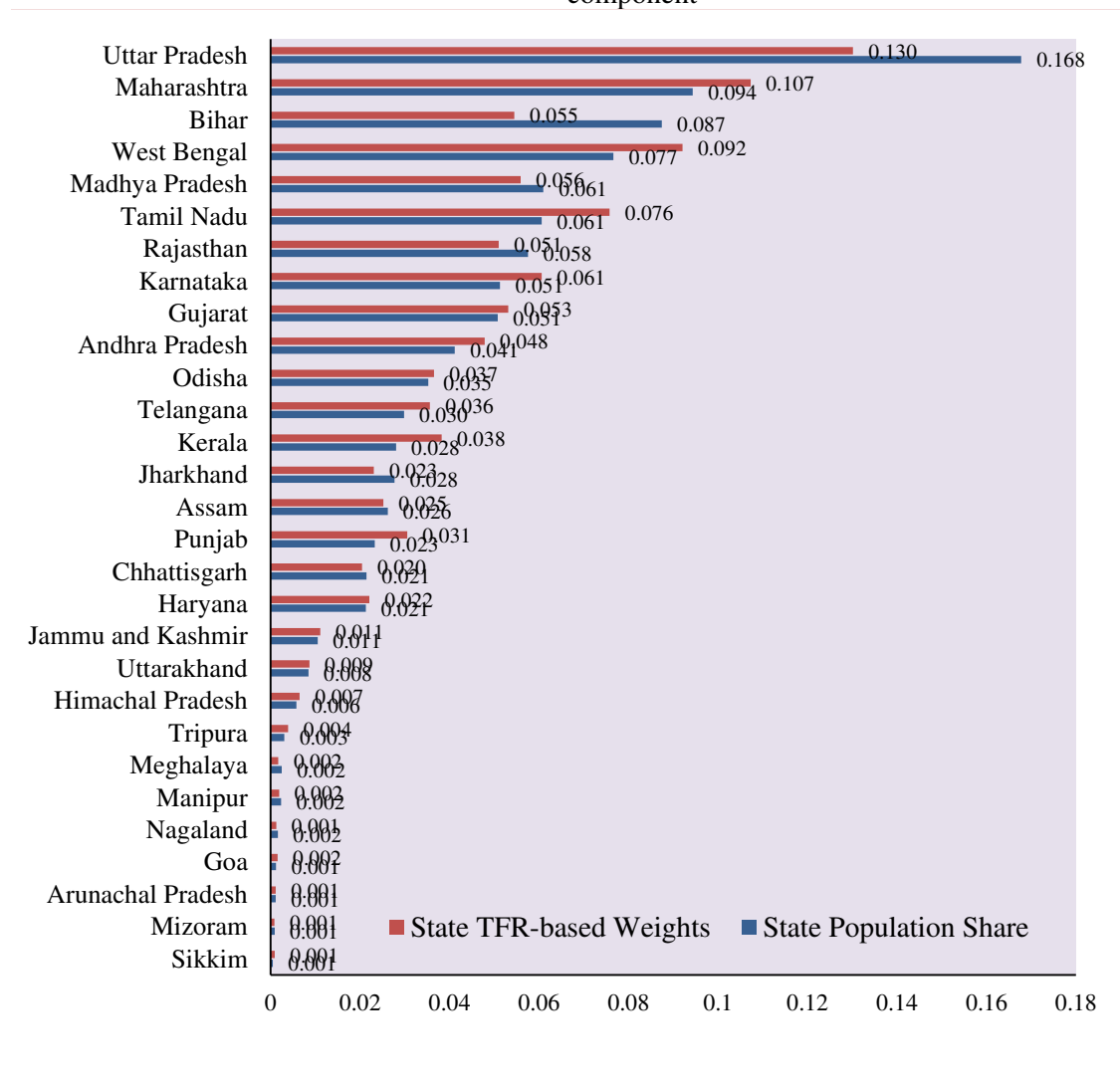
The weights calculated using TFR and normalized by using population share are presented in Table 6.2. The value of the weights obtained varies considerably from 13 per cent to 0.10 per cent. The highest share on the basis of these calculations will be allotted to Uttar Pradesh (13 per cent), followed by Maharashtra (10.7 per cent), West Bengal (9.2 per cent), Tamil Nadu (7.6 per cent) and Karnataka (6.1 per cent). (Refer Figure 6.2) The States which will receive a relatively lower share will mostly belong to the North-eastern part. States such as Arunachal Pradesh, Sikkim, Mizoram and Nagaland will receive .10 per cent weight. Manipur, Meghalaya and Goa will receive 0.20 per cent weight. Clearly, the values of weights are not in tandem with population share. There are States which have high population share but the value of weights is lower. For instance in case of Uttar Pradesh the weight assigned is quite lower even though the population share is the highest. Similarly, the population share of Bihar is higher (8.7 per cent) but it has received a weight of only 5.5 per cent.

Notably, the debate over the distribution of resources might be played down with this distribution of weights as none of the South Indian States will lose out because they have low TFRs. For instance, the TFR of Andhra Pradesh (1.83), Karnataka (1.8), Telangana (1.78) Tamil Nadu (1.7) and Kerala (1.56) are on the lower side but the weight assigned (4.8 per cent, 6.1 per cent, 3.6 per cent, 7.6 per cent and 3.8 per cent respectively) are such that they will receive relatively more share in resources based on this criteria. Therefore, the South Indian States will gain if TFR is used for reward structure. And, also the States with highest population share such as Uttar Pradesh, West Bengal and Maharashtra shall continue to receive adequate incentive due to 2011 population weight structure.

To conclude this section, there can be a number of intermediate targets for stabilizing the population such as reduction in birth rate, access to family planning, promotion of female literacy and employment opportunities. However, there is a cyclical nature behind these indicators and all these are interlinked. Given a choice to select a comprehensive indicator, it would be ideal to focus on TFR as it is now routinely available with the NFHS surveys and can be corroborated through other systems like the Sample Registration System data. Besides, the TFR levels affect the birth rates and the population structure. The problem with other indicators is that it is not possible to measure them with sufficient accuracy because of data limitations.

TFR is easily influenced by literacy and employment opportunities among females. A little awareness about family planning measures can led to drastic reduction in TFR over a very small time frame. One of the SDGs is to stabilise the global population of world to 8 billion by 2030. In this respect, TFR can be used as a goalpost by empowering people by providing access to family planning services. As fertility is a complex multifactorial phenomenon. Alternate policy initiatives will have to be planned to motivate States to lower the TFR.

Figure 6.2: Population shares and TFR-based weights for Indian states for population stabilization component



6.3 Environment and NDC commitments

In India, environmental regulation is constitutionally mandated under various Acts, such as the air and water pollution acts, the forest conservation act, the wildlife protection act, and the environment protection act. Environmental regulation requires states to comply with scientifically determined standards for air and water quality, and to maintain area under protected ecosystems (forest cover, coastal zones, mangroves, etc.). While environmental regulation is extremely important for sustainable development, it imposes costs on the states. These range from maintenance and operating costs, to opportunity costs for those that have substantial part of their land areas protected for their forest cover and/or for protecting wildlife, to those that are impacted by severe air and water pollution and incur clean up or abatement costs. Thus, Indian states would differ with respect to the costs incurred both by type and level of costs. The latter would depend on two factors: the extent of environmental compliance and the type and extent of natural resource stocks available with the state.

However, the positive externalities of environmental regulation lead to benefits across scales. There are benefits to the people living in the state itself, for instance, in the case of abatement of air pollution in cities. There are benefits at a regional level since multiple ecosystem services flow across borders, for instance, in the case of abatement of air and water pollution across air sheds and watersheds in Northern India. At the international level, India has caught global attention for its forward-looking commitments towards the Paris Agreement, through its Nationally Determined Contributions (NDCs). Two major thrust areas are targets set for renewable energy and sinks for carbon. The TOR of the 15th Finance Commission mentions in 3(ii), that in making its recommendations, the Commission shall consider the demands on the resources of the Central Government on account of climate change, among other factors. In the context of proposing measurable performance-based incentives for States, at the appropriate level of government, in TOR 4 (iii) sustainable development goals have been mentioned. For both the climate change implications and SDGs (e.g. Climate action, Life on land, etc.) forestry sector has an important role to play. In particular, it deserves special mention in the context of allocations made by previous FCs for forests. As mentioned earlier (chapter 3), the 14th FC brought in the *dense* forest cover in a state as a factor determining interstate devolution whereas

earlier provision for grants had been made. The primary argument in the FC award has been in terms of the economic disability posed to states which are mandated to maintain forest cover and the need to compensate them for the losses thereof in fiscal capacity.

The NDC target is to create an additional carbon sink of 2.5 to 3 billion tons Carbon dioxide equivalent through forest and tree cover by 2030. Data on state wise forest cover from the recent SFR (FSI, 2017) indicates that there has not been appreciable increase in forest cover across most states over the period of the last decade. While the existing formula may have compensated for fiscal capacity, the 14th FC also acknowledged the role of forests in meeting international obligations. As the devolution is an untied allocation by its very nature, it is expected that it may not provide any incentive to increase forest cover in line with the NDC target, on one hand. On the other hand, historically, grants have been limited in size and probably will require a substantial boost in order to help meet even part of the costs of creating a carbon sink of this magnitude. The formula seems well-positioned to address compensation for the purpose of fiscal disability and is consistent with the intention of horizontal devolution which is to ensure devolutions to states to meet their developmental needs.

Apart from the issue of the NDC target, an important concern with incentivizing dense forest cover alone is that it fails to take note of the valuable ecological resources outside such forests in many states. Some of these are also mandated to protect the environment and ecosystems (for instance, preservation of species outside dense forests as in grasslands for Asiatic lions in Gir, enriching soil carbon and enhancing tree cover outside dense forests, and so on). Under the circumstances, a re-look at the devolution criteria may be considered to capture forward looking aspects as well as to enhance the equity aspect of compensating for fiscal capacity.

An analysis of the data and interactions with forest department officials suggests that the current formulation in which untied funds are devolved to states, is unlikely to help India achieve its target for creation of additional CO₂ sink through forest and tree cover. Implicitly it also creates a wedge in the distribution across states with dense forest cover and those with other significant environmental constraints. Nor, does it seem to have provided incentives for states to increase

tree cover outside forests. Some motivational alternatives alongside illustrative data are presented below.

Forest Cover in Previous FC awards

The conversation around forest cover has been present from the 11th FC itself. The 11th FC found that forest cover was below the desirable level and states were encouraged to prepare working plans for management of forests. Obstacles in maintaining forests with respect to the working plans was highlighted by the states in the 12th FC when they claimed that the restrictions placed by the Supreme Court on exploitation of forest wealth led to financial constraints regarding maintenance and the forest becoming a net liability rather than a source of revenue. They put forth a demand for separate grants for maintenance of forests which the 12th FC conceded to, stating that the forests were a national responsibility and recommended a grant of Rs.1000 crore to be distributed amongst states based on their forest area for the period 2005-10 over and above states' forest department spending. The 13th FC recommended an amount of Rs. 5000 crore as forest grant for the award period with untied grants for the first two years and a conditional release of grant for the last three years depending on the number of approved working plans. The 13th FC grant formula took into consideration share of the states' forest area in total forest area which was weighted by forest density, in order to address both concerns of economic disability and quality of forests. Under quality of forests, progressively higher weights were given to area under moderately dense and dense forest cover. The 14th FC argued that forests and their externalities have impacts both on the provision of services to people living in forest areas (hence, state expenditure) and also decline in revenue due to restriction on exploitation and hence needed to be compensated. In addition, the 14th FC acknowledged importance of preserving forests in order to enable the nation to meet its international obligations on environment related measures. The 14th FC assigned 7.5 per cent weight to the forest cover and took into consideration moderately dense forest and very dense forest (from here on, collectively referred to as dense forest) as part of the formula.

Data Source

Data for the purpose of analysis was collected from the Indian State of Forests report published by the Forest survey of India. The data was compiled from ISFR 2009, 2015 and 2017 and

correspond to the periods October 2006 to February 2007 (referred to as 2007), October 2013 to February 2014(referred to as 2013) and October 2015 to December 2015 (referred to as 2015) respectively.

Box 6.2: Forest Component -Relevant Definitions

Forest cover:

According to ISFR 2015, “the term forest cover as used in ISFR refers to all lands more than one hectare in area with a tree canopy of more than 10% irrespective of land use, ownership and legal status. It may include even orchards, palm, bamboo etc.”

Recorded Forest Area:

The definition of recorded forest area according to ISFR 2015, RFA refers to “All the geographic areas recorded as forests in government records.” ISFR 2015 and ISFR 2017 state that “Recorded Forest Areas largely consist of Reserved Forests (RF) and Protected Forests (PF), which have been constituted under the provisions of Indian Forest Act 1927 or its counterpart State Acts.”

Classification of forest in terms of canopy density classes:

According to ISFR 2017,

Very Dense Forest: “All lands with tree canopy density of 70% and above.”

Moderately Dense Forest: “All lands with tree canopy density of 40% and more but less than 70%.”

Open Forest: “All lands with tree canopy density of 10% and more but less than 40%”

Scrub: “Degraded forest lands with canopy density less than 10%”

Non-forest: “Lands not included in any of the above classes (includes water)”

Tree Cover:

According to ISFR 2017, “tree cover is “an estimated area comprising of tree patches, which are less than one hectare and isolated trees outside the recorded forest.” “Trees included in tree cover constitute only a part of Trees Outside Forest.”

Trees Outside Forest:

According to ISFR 2015, “TOF are trees outside the recorded forests”. ISFR 2017 also additionally states that “Trees existing outside the recorded forest area mainly in the form of block, linear and scattered size of patches are called TOF”.

Green wash area:

According to ISFR 2017, “The area shown by green color, which is referred to as a green wash area represents the forested areas at the time of survey carried out to prepare topographic sheets.” “The green wash has been used as a substitute to RFA in respect of those states and UTs from where the digitized boundary of recorded forest area is unavailable.”

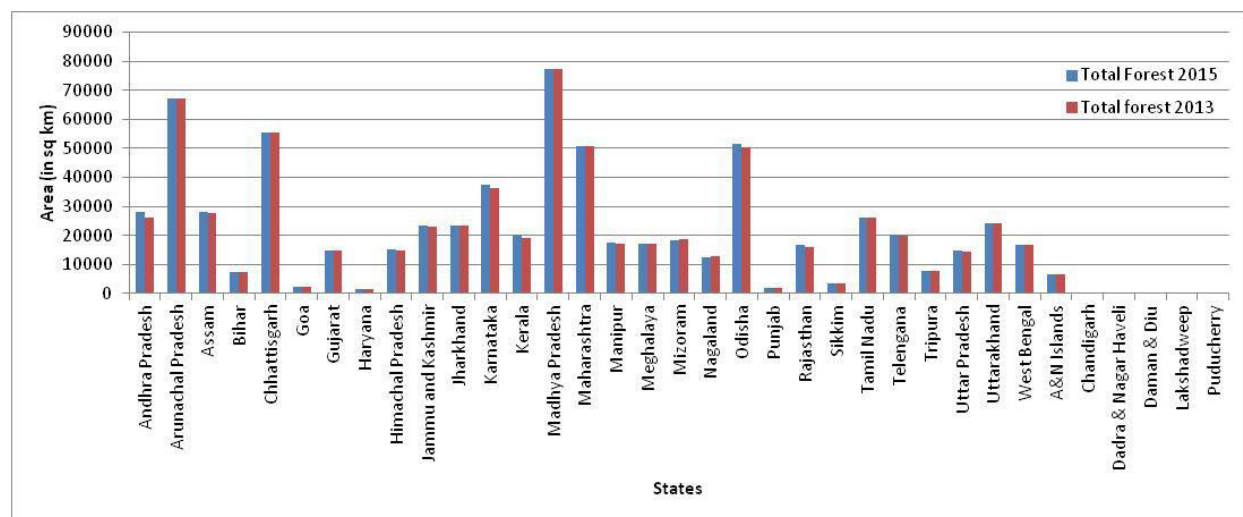
Proposals for awards to forestry sector

Two proposals are suggested -

- I. **In terms of fiscal disability:** There is a need to expand the formula beyond dense forest since fiscal disability could arise due to different bio-physical constraints other than forests- due to a state's grassland, hilly terrain, coastal areas and so on which all increase costs to states. Considering data constraints that limit inclusion of many of these bio-physical constraints, a demonstrative case can be made by addressing at least one of these concerns through consideration of alternative indicators of RFA and green cover.
- II. **In terms of payments for ecosystem services:** In order to incentivize creation of a carbon sink in line with the NDC commitment, grants could be provided for improving existing forests and tree cover outside forests.

Using data from ISFR 2015 and 2017, it can be seen from Figure 6.3 that there has not been much change in total forest across the period. Further, dense forest cover is seen to have reduced in some states during this period. (For data, refer to Table 6.A.2 in Appendix)

Figure 6.3 Area under total forest cover for all states from 2013 to 2015

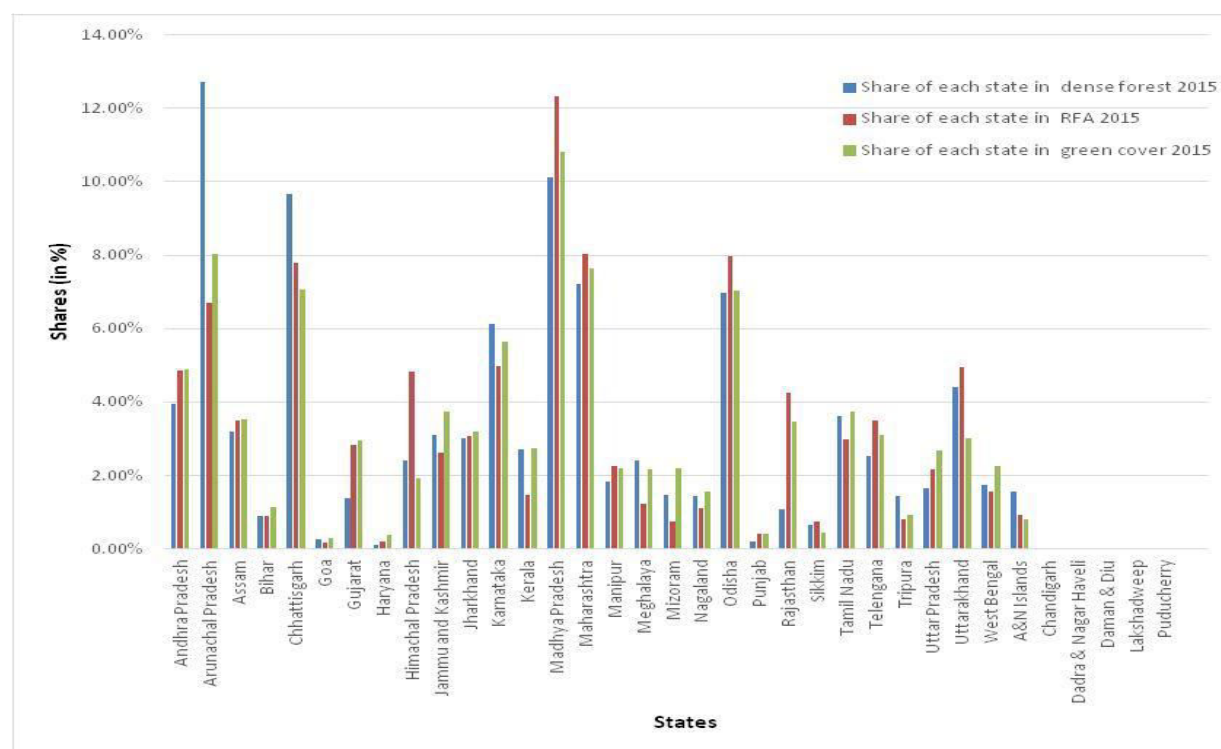


Source: Compiled from FSI 2017 and FSI 2015

Note: Area is given in Sq Km; Includes Jammu and Kashmir area outside LoC that is under illegal occupation of Pakistan and China; 2015 data is 2015 (Updated) data; Total forest in the ISFR report has been calculated as the sum of very dense forest, moderately dense forest and open forest.

a. Proposal 1: Expansion of definition- The formula seems insufficient and hence an expansion of the definition is proposed. Two alternative expansions are suggested for consideration, given current availability of data: recorded forest area as defined by the Forest Survey of India (RFA) or Green Cover which is defined as the sum of Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub and Tree Cover. A definition of these terms is given in the Appendix. (Refer to Note 2 in Appendix). In terms of weightage, there may not be a strong case for distinguishing between types of vegetative cover for compensating for fiscal disability. An expansion of the formula is also in line with the principle of equity. The share of each state for these three alternatives is given in Figure 6.4 below. (For data table, refer to Table 6.A.3 in Appendix)

Figure 6.4 Share of each state in dense forest, Recorded Forest Area and green cover for 2015



Source: Authors calculations using data from ISFR 2017

Note:

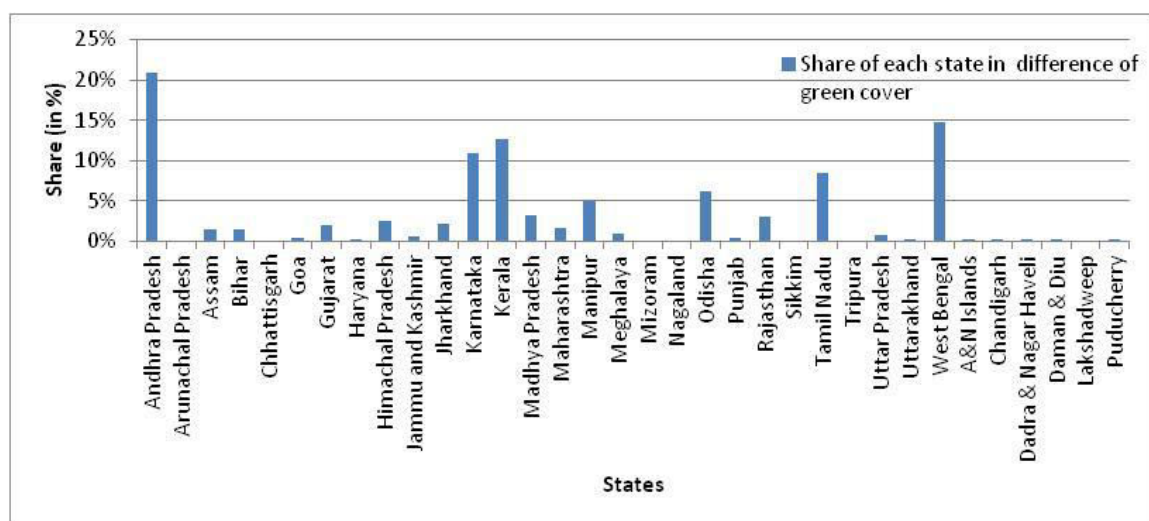
Dense forest was a term used by the 14th FC and is a sum of Very Dense Forest and Moderately Dense Forest; Jammu and Kashmir includes Jammu and Kashmir area outside LoC that is under illegal occupation of Pakistan and China; Green cover is defined as a sum of Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub and Tree Cover.

There are a couple of caveats to be noted in using this data of Recorded Forest Area. In most states dense Forests are included in the Recorded forest areas and hence are fairly represented in

the recorded forest area. However, in the North Eastern States, there are many community owned forests outside the Recorded Forest Areas. In addition, data in the public domain does not clearly indicate whether all vegetation in the Coastal Regulation Zones is included in the data.

Proposal 2: In regard to incentivization of performance, conditional grant dependent on performance is considered to be appropriate. However, the size of the grant is the point to be deliberated upon. A widely differing range of estimates exist in the literature, however, even the most conservative estimates are well beyond the 5000 Crore grant made for forestry sector under the 13th FC. The period from 2007 to 2015 is chosen so that there is comparability in observations and it is suggested that states share is determined by the difference in green cover ($\Delta\text{Green Cover} = \text{Green Cover}_{2015} - \text{Green Cover}_{2007}$). This would incentivize states that put in efforts to improve their green cover by rewarding performance. The shares of states using this measure of the difference in green cover, is provided in Figure 6.5 below. (For data, refer to Table 6.A.4 in Appendix)

Figure 6.5 Share of each state in difference of green cover for period between 2007 and 2015



Source: Authors calculations using data from ISFR 2009 and ISFR 2017

Note:

Jammu and Kashmir includes Jammu and Kashmir area outside LoC that is under illegal occupation of Pakistan and China; Green cover is defined by a sum of Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub and Tree Cover

The decision of whether to opt for a grant or a formula based devolution, or a judicious combination of the two should ideally depend on the desired objective (Dasgupta & Srikanth

2019)¹³. In the case of a formula based, untied devolution to compensate for fiscal disability, it can be argued that states can face fiscal disability from various biophysical characteristics and forests constitute an important, but only one of these. Another prominent characteristic, apart from forests, are mountains. Mountains impose constraints on states while taking forward their commitments for provision of public services in the form of increased costs (Dasgupta & Goldar, 2017) and arise on the expenditure side, unlike forests where fiscal disability arises from the limitations for raising revenues through alternative land use on the revenue side. Many mountainous states also have significant overlaps with forested states. Yet, a case can be made for privileging forests because of their multiple ecosystem services and the fact that they represent a planetary boundary (Rockstrom et al., 2009; IPBES, 2018), essential for human existence. In which case, the formula based devolution may be continued with some modifications as suggested above in the computation of state shares, and an overall weightage of 5%.

Alternatively, grants maybe considered. Grants make it possible to ensure that fund allocation serves stated targets for forest conservation. It also make it easier to build in social and environmental safeguards to ensure that multiple goals are served, such as improving forest condition alongside the achievement of relevant SDGs through scientifically planned livelihood and income generation activities. The principal argument against grants seems to have been the fact that conventionally the amount of grant has been relatively smaller than the magnitudes devolved through the formula. We would recommend a straightforward doubling of the grant amount from the 13th Finance Commission, along with measures to monitor the utilization of the grant mid-way through the award period, and ensuring safeguards for its implementation on the ground in keeping with the achievement of the SDG commitments. The argument thus, is framed not so much in terms of the NDC, but in terms of achieving SDGs as well. Also, India seems well set on the path of achieving the NDC target, as defined on a baseline of 2005 (akin to the commitment on reduction in emissions intensity of the economy).

Recent experience seems to suggest that if the desired objective is to encourage the achievement of specific targets, then grant based allocation where funds are tied is likely to work better. Else,

¹³ Under review

if the primary intent is to compensate the state for fiscal disability, the untied allocation through the formula provides the desired flexibility to states to help overcome the disability, and meet their expenditure needs. However, the implications of going with one or the other vary from state to state as our results clearly indicate. .

Some other considerations:

6.4 Disaster Management

Earmarking funds for disaster management and distributing them to different levels of jurisdictions in a federal country like India are some of the challenges for finance commissions. There is a need for considering adaptation or response strategies and mitigation strategies and the cost implication of disasters.. Response strategies for disaster management require finances to attend to the problems arising in the short run, probably the immediate mandatory five year period of FC award. In contrast, mitigation strategies require funds for very long run planning which makes it difficult for FC to assess the cost and make recommendations.

The Indian Parliament had enacted the Disaster Management Act, 2005 for constituting two types of funds as expected: one for disaster response and the other for mitigation.¹⁴Subsequently, disaster management authorities were introduced at national, state and district levels for channelizing funds earmarked by Union FC, state FCs and the respective governments for disaster management. The 13thFC was of the view that the mitigation strategies have to be a part of planning process and that direct transfers from respective ministries of centre, states and Niti Aayog could help meet this objective. The 14th FC recommended an aggregate amount of Rs. 61219 crores towards State Disaster Relief Fund (SDRF) with centre and states contributing to it in the ratio of 90:10 percent respectively. It is a challenge to assess the costs of both adaptation and mitigation in disaster management, and to make recommendations for different levels of government in sharing the cost. Currently, only the cost of response strategies is considered by the FCs given the problems in assessment of mitigation strategies. For making reliable assessments of finances for disaster management, it is important to have some reliable scientific information in advance about the possible number of events and their intensity. Some earlier FCs

¹⁴The list of recorded disasters considered by various FCs after this act include cyclones, droughts, earth quakes, fires, floods, tsunamis, hailstorms, landslides, avalanches, cloud bursts , pest attacks, cold waves and frost.

have noted the need for developing indices which reflect a state's or district's vulnerability to disasters. The central and various state governments have now realized the need for developing the Hazard Vulnerability Risk Profiles of States and considering them as a basis for determining state disaster response fund (SDRF) and central allocations for this purpose. It is recommended that these profiles are made available to the FCs by the concerned authorities, so that it is taken into account in making the recommendations for SDRF. Availability of this scientific information could also help in designing and assessing costs of mitigation strategies for disaster management.

Information about consolidated yearly revenue grants of centre to states during the period 2000-2001 to 2015-2016 at current prices reveals the following. (Refer to Table 6.3). There is a sharp increase in these grants after the award of 14th FC and has more than doubled (Rs. 57560.4 to Rs. 129100.0 million) between the financial years 2014 and 2015. One also finds very significant variation in grants received by various states reflecting that states differ substantially in respect to vulnerability to natural disasters. In the year 2016 the bigger states of UP, Maharashtra and Tamil Nadu got relief of Rs. 77019.6, 28121.2, and 18386.2 million respectively. However, one of the smaller states of Uttarakhand got the relief amounting to Rs. 62342.7 million which was much higher than the relief given to Maharashtra. These reliefs granted ex post indicate that logically there are significant underlying differences in the disaster vulnerability index among states.

Table 6.3: Consolidated Revenue Grants of Centre to States on Account of Natural Calamities

Year	Grants (Rs. Million)
2000	4997.2
2001	5948.9
2002	32345.8
2003	17741.6
2004	21665.5
2005	32716.7
2006	36038.5
2007	26392.3
2008	29141.9
2009	34957.1
2010	52180.5
2011	32138.6
2012	55593.8

2013	61590.3
2014	57560.4
2015	129100
2016	110600

Source: State Finances, Reserve Bank of India

6.5 Air and Water Pollution

Indian states could differ with respect to sustainable use of environmental resources such as air quality and water quality. There is an opportunity cost to the states to keep the environmental resource stocks at sustainable or natural regenerative levels. Environmental regulation to make the states comply with the scientifically fixed environmental standards (say WHO standards for air and water quality and forest cover) ensures that the environmental resource stocks in a state are maintained at their natural regenerative levels. The cost to the states to comply with these standards is called the cost of its environmentally sustainable development. It could be empirically observed that Indian states differ with respect to level of environmental compliance and abatement costs incurred.

Positive externalities of sustainable use of environmental resources by a state confer benefits to the people belonging to it and also benefits for the people in the rest of states and in some cases rest of the world. The amount of benefits each state generates in this context depends upon the level of its compliance to environmental regulation and the amount of stocks of environmental resources it possesses. The instruments of fiscal transfers from centre to states pertaining to environmental performance of states could be therefore either cost based or benefit based. The transfers are meant for compensating states for the cost they incur or benefits they confer by efficient environmental management.

6.5.1 Air Pollution

Environmentally sustainable development requires that the atmospheric quality, one of the important environmental resources has to be maintained at its natural regenerative level or at safe air quality standards fixed by WHO and other national and international institutions. The local air quality is affected by emissions of Particulate Matter (PM₁₀), Sulphur Dioxide (SO₂), Nitrogenous Oxide (NO_x) and other air pollutants while the emissions of greenhouse gases like

Carbon Dioxide (CO_2) have effects on global atmosphere quality and climate change. The environmental regulations of centre and states in India require that emissions from all anthropogenic activities in an Indian state have to be such that the air quality standards are met. Regulation entails an additional cost to the state's economy in the form of air pollution abatement costs incurred by polluting activities in the state. Equally it provides health benefits of reduced air pollution to people living in the state and the benefits of reducing climate change problem for the world community in the case of reduction of greenhouse gases. Scientifically developed air quality index for each state accounting for effects of different types of emissions on air quality if possible could be helpful to gauge each states performance in air pollution reduction.

The instruments of resource transfers from centre to states designed to compensate states for the emissions reduction could be again either benefit based or cost based. The weights to be assigned for different pollutants to compute an air quality index could be either benefit based or cost based. Hypothetically if all the emissions in the state are contained to WHO emission standards, the computed air quality is index 100 percent. In the case of some or more of air pollutants exceeding the standards, the air quality index will be below 100 percent. The cost based weights could be objectively estimated using the estimated abatement cost function for each pollutant. However, the estimation of benefit based weights requires the use of valuation methods involving lot of assumptions and subjectivity. There are number studies recently done in India for estimating health benefits to urban households in cities like Delhi, Kolkata and Hyderabad from particulate matter reductions using environmental valuation methods. It is empirically observed in India that normally only Particulate Matter (P_{10}) emissions exceed the prescribed standards in major urban areas while the emissions of Sulphur Dioxide (SO_2) and Nitrogenous Oxide (NO_x) do not violate the standards. Therefore the 15th FC could be guided simply by Particulate Matter (PM_{10}) emission levels in each state instead of hypothetical air quality index for each state in deciding about the relative shares of states in the resources earmarked for maintaining air quality in the states.

Meta-analysis of environmental valuation studies in India related to effects of urban air pollution (PM_{10}) on household health could provide information about household marginal willingness pay or demand function for urban air quality in India. Using this demand function and data about

annual average PM₁₀ level for each state for a recent year, health damages from PM₁₀ emissions for a typical household in the state could be estimated. The total health damages to the state from PM₁₀ emissions could be estimated by extrapolating the damages to a typical household to the entire population of urban households in the state. Estimates of health damages obtained in this way for all the states in India could be used to calculate the relative shares of states in the central transfer earmarked for air quality in the states. Appendix 6 describes a method of determining state specific air pollution standards for India with implications for tax devolution.

6.5.2 Water Pollution

The case of water pollution or pollution levels of rivers and water bodies in the states, it is difficult to objectively measure ambient water quality specific to a state. Pollution of water bodies is normally measured by parameters like Dissolved Oxygen (DO), Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) and Suspended Solids (SS). Given that all the major rivers in India are interstate rivers, it is not possible to attribute the ambient river pollution in a state entirely to that particular state. Environmental performance in reducing river pollution is the result of efforts of all states in its basin. For example Ganga Action Plan to clean Ganges is a project involving central government and governments of all states in the Ganga basin. Therefore, water pollution could not be considered as one of the environmental indicators specific to each state and it could not be used as one of the environmental criteria for tax devolution.

Appendix- Chapter 6

Note 6.A.1: Social Welfare Function

Considering m number of states in a federal country and assuming that Central Government has regional income distributional preferences, the Social Welfare Function giving a constant elasticity marginal social utility function may be written as:

$$W = \sum_{i=1}^m A \frac{Y_i^{1-e}}{1-e} \quad (1)$$

where, Y_i : per capita income of ith state, A: a constant and e: elasticity of social marginal utility with respect to state per-capita income.

From (1) we could derive social marginal utility of income as

$$\frac{\partial W}{\partial Y_k} = AY_k^{-e} \quad (2)$$

Considering the average of per capita incomes of states \bar{Y} as numeraire we have

$$\frac{\partial W}{\partial Y_k} = A\bar{Y}^{-e} = 1 \text{ and } A = \bar{Y}^e \quad (3)$$

$$\frac{\partial W}{\partial Y_k} = \left(\frac{\bar{Y}}{Y_k}\right)^e = D_k \quad k = 1 \dots m \quad (4)$$

These social marginal utilities can be taken as income distributional weights for different states in a federal country. The distributional weight is $D_k > 1$ for the state having per capita income lower than the average of states. \bar{Y} . The share of each state S_k , $k = 1 \dots m$, in the amount of transfer the FC decides to transfer to the states on basis of regional income distribution criteria could be worked out as follows.

$$D_k / \sum D_k = S_k \quad k = 1 \dots m \quad \text{with } \sum S_k = 1 \quad (5)$$

Considering the per capita income of India as numeraire and given an estimate of e, the elasticity of social marginal utility of income for India, distributional weights to the incomes of people belonging to different states in India could be computed.

Table 6.A.2: Table showing change in total forest cover from 2013 to 2015 for all states

State	Total forest 2015	Total forest 2013	Difference in total forest	State	Total forest 2015	Total forest 2013	Difference in total forest
Andhra Pradesh	28147	26006	2141	Nagaland	12489	12939	-450
Arunachal Pradesh	66964	67154	-190	Odisha	51345	50460	885
Assam	28105	27538	567	Punjab	1837	1771	66
Bihar	7299	7254	45	Rajasthan	16572	16106	466
Chhattisgarh	55547	55559	-12	Sikkim	3344	3353	-9
Goa	2229	2210	19	Tamil Nadu	26281	26208	73
Gujarat	14757	14710	47	Telangana	20419	19854	565
Haryana	1588	1580	8	Tripura	7726	7890	-164
Himachal Pradesh	15100	14707	393	Uttar Pradesh	14679	14401	278
Jammu and Kashmir	23241	22988	253	Uttarakhand	24295	24272	23
Jharkhand	23553	23524	29	West Bengal	16847	16826	21
Karnataka	37550	36449	1101	A&N Islands	6742	6751	-9
Kerala	20321	19278	1043	Chandigarh	21.56	21.66	-0.1
Madhya Pradesh	77414	77426	-12	Dadra & Nagar Haveli	207	206	1
Maharashtra	50682	50699	-17	Daman & Diu	20.49	19.61	0.88
Manipur	17346	17083	263	Lakshadweep	27.1	27.06	0.04
Meghalaya	17146	17262	-116	Puducherry	53.67	56.95	-3.28
Mizoram	18186	18717	-531	TOTAL	708080.8	701306.3	6774.54

Source: Compiled from FSI, 2015 and FSI, 2017

Note:

Area in sq km; Dense forest was a term used by the 14th FC and is a sum of Very Dense Forest and Moderately Dense Forest; Jammu and Kashmir includes Jammu and Kashmir area outside LoC that is under illegal occupation of Pakistan and China; 2015 data is 2015 (Updated) data; Total forest in the ISFR report has been calculated as the sum of very dense forest, moderately dense forest and open forest.

Table 6.A.3: Table showing share of each state in dense forest, RFA and green cover for 2015

State	Share of each state in dense forest 2015 (in %)	Share of each state in RFA 2015 (in %)	Share of each state in green cover 2015 (in %)	State	Share of each state in dense forest 2015 (in %)	Share of each state in RFA 2015 (in %)	Share of each state in green cover 2015 (in %)
Andhra Pradesh	3.94%	4.86%	4.89%	Nagaland	1.44%	1.12%	1.58%
Arunachal Pradesh	12.72%	6.70%	8.02%	Odisha	6.97%	7.98%	7.04%
Assam	3.20%	3.50%	3.52%	Punjab	0.20%	0.40%	0.41%
Bihar	0.88%	0.90%	1.15%	Rajasthan	1.09%	4.27%	3.47%
Chhattisgarh	9.66%	7.79%	7.07%	Sikkim	0.65%	0.76%	0.43%
Goa	0.27%	0.16%	0.30%	Tamil Nadu	3.60%	2.98%	3.73%
Gujarat	1.37%	2.82%	2.95%	Telengana	2.54%	3.51%	3.11%
Haryana	0.12%	0.20%	0.37%	Tripura	1.45%	0.82%	0.94%
Himachal Pradesh	2.42%	4.83%	1.91%	Uttar Pradesh	1.65%	2.16%	2.67%
Jammu and Kashmir	3.11%	2.64%	3.73%	Uttarakhand	4.39%	4.95%	3.00%
Jharkhand	3.02%	3.08%	3.20%	West Bengal	1.76%	1.55%	2.26%
Karnataka	6.14%	4.99%	5.63%	A&N Islands	1.57%	0.93%	0.80%
Kerala	2.72%	1.47%	2.75%	Chandigarh	0.00%	0.00%	0.00%
Madhya Pradesh	10.12%	12.34%	10.82%	Dadra & Nagar Haveli	0.02%	0.03%	0.03%
Maharashtra	7.23%	8.03%	7.63%	Daman & Diu	0.00%	0.00%	0.00%
Manipur	1.83%	2.27%	2.20%	Lakshadweep	0.00%	0.00%	0.00%
Meghalaya	2.42%	1.24%	2.16%	Puducherry	0.00%	0.00%	0.01%
Mizoram	1.47%	0.74%	2.20%				

Source: Authors calculations using data from FSI 2017

Note: Columns total to 100; Dense forest was a term used by the 14th FC and is a sum of Very Dense Forest and Moderately Dense Forest; Jammu and Kashmir includes Jammu and Kashmir area outside LoC that is under illegal occupation of Pakistan and China; Green cover is defined by a sum of Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub and Tree Cover.

Table 6.A.4: Share of each state in difference of green cover for period between 2007 and 2015

State	Difference in green cover 2007-2015	Share of each state in difference of green cover (in %)	State	Difference in green cover 2007-2015	Share of each state in difference of green cover (in %)
Andhra Pradesh	5121	20.86%	Nagaland	-395	0.00%
Arunachal Pradesh	-38	0.00%	Odisha	1502	6.12%
Assam	357	1.45%	Punjab	109	0.44%
Bihar	357	1.45%	Rajasthan	760	3.10%
Chhattisgarh	-72	0.00%	Sikkim	-47	0.00%
Goa	114	0.46%	Tamil Nadu	2097	8.54%
Gujarat	502	2.05%	Tripura	-363	0.00%
Haryana	9	0.04%	Uttar Pradesh	205	0.84%
Himachal Pradesh	597	2.43%	Uttarakhand	14	0.06%
Jammu and Kashmir	143	0.58%	West Bengal	3638	14.82%
Jharkhand	535	2.18%	A&N Islands	19	0.08%
Karnataka	2698	10.99%	Chandigarh	2.58	0.01%
Kerala	3120	12.71%	Dadra & Nagar Haveli	3	0.01%
Madhya Pradesh	794	3.23%	Daman & Diu	12.76	0.05%
Maharashtra	400	1.63%	Lakshadweep	-0.9	0.00%
Manipur	1199	4.88%	Puducherry	2.67	0.01%
Meghalaya	234	0.95%	Total	22869.11	
Mizoram	-760	0.00%			

Source: Authors calculations using data from FSI 2009 and FSI 2017

Note: Columns total to 100, Jammu and Kashmir includes Jammu and Kashmir area outside LoC that is under illegal occupation of Pakistan and China; Green cover is defined by a sum of Very Dense Forest, Moderately Dense Forest, Open Forest, Scrub and Tree Cover

Chapter 7: Summary and Recommendations

7.1 Summary of Findings from the study

This report has looked into various aspects of the vertical and horizontal devolution adopted under different Finance Commissions, in view of trends and patterns in the fiscal space and the socio-economic developmental needs of the country. We present below a summary of the findings presented in the report.

Chapter 1 provides a review of the recommendations by various FCs, especially the last four with respect to vertical and horizontal devolution in India. It points out that FCs have been guided by the constitutional provisions and additional terms of reference provided by the President. It discusses the various criteria used by the FCs such as assessment of needs of the states, accommodative capacity of the centre, trends in revenue and expenditure of states and centre, tax efforts and tax buoyancy. The chapter also discusses how some recent commissions have attempted to balance equity and efficiency dimensions in horizontal devolution by considering factors such as population, income, area, fiscal capacity and cost disability. The chapter concludes that FCs have preferred continuity with change in the fiscal system.

Chapter 2 examines the trends and pattern in variables related to vertical devolution. It points out that the central government collects about two-thirds of the combined revenue and the states the rest in the form of their own taxes. The Centre and the states positions in the revenue collection gets reversed after the transfers enabling the states to support more revenue expenditure than the centre. The chapter concludes that while FCs have not substantially deviated from their immediate predecessor in terms of share of states in central divisible pool, yet the cumulative effect of the incremental changes during 1st to 14th commissions have been large enough to double the transfers as a percentage of central revenue. The fiscal balance has shifted in favour of states over the years. An important factor neglected in deciding federal transfer is the efficiency in service delivery. Developing a verifiable objective criteria for judging relative efficiency in delivery of public services will be very useful to future commissions.

Chapter 3 concerns itself with the trends and patterns in horizontal fiscal devolutions and summarizes key indicators that have been considered for devolution over the years. The indicators include- population, income distance, fiscal capacity distance, area, index of infrastructure, forest cover, tax effort and fiscal discipline. It notes that there has not been much variation in shares of states in the net proceeds, since income and population are the dominating criteria across most FCs carrying almost 75% of the weight. It notes that inequity was addressed by a few FCs which considered an index of backwardness or through poverty ratio. In the recent past, FCs were said to be mostly guided by performance based criteria in addition to the need based criterions.

Chapter 4 undertakes analyses of various factors that affected the trends in devolution. The matters of concern broadly comprised of whether there was an equalizing effect of Central transfers on states and understanding the effects of transfers on social sector needs of the centre and state. The question of whether there was an equalizing effect of central transfers was examined by considering the revenue and equalization factors, and the transfers are observed to have an equalizing effect on per capita total revenue that was available to states. States spent 3 to 4 times higher on social sector expenditure (as a percentage of state domestic product) in comparison to the centre, with high interstate variation in both social sector expenditure (as a percentage of state domestic product) and per capita social sector expenditures. Post the increased devolution in 14 FC where the centre reduced its scope for its own social sector spending through specific transfers; expenditure on health and education in per capita terms for richer states still increased, indicating that general purpose transfers were unable to offset the revenue disabilities of low income states completely. Social sector expenditure was found to be responsive to increase in both NSDP and devolution, the latter being more effective when routed through the general purpose transfer which could imply that specific central transfers might not be required to meet these kind of expenditures. Specific transfers for social sector expenditure may be required when richer states suffer from some unique social and economic infrastructural deficits, or when there are large variations in fiscal capabilities among states that are not offset by general purpose transfers.

Chapter 5 focused on the status of key fiscal parameters on resource allocation. It concerns itself with the fiscal efficiency indicators of tax effort and fiscal discipline and makes remarks on GST. Though some poorer states (in terms of per capita NSDP) have comparable tax efforts as compared to some richer states, in reality the poorer states have done better given their lower income base. Additionally, it is noted that there is a fall in fiscal discipline for some states over time. Evidence suggests that the introduction of fiscal discipline as a criteria, does not necessarily lead to higher own tax revenues if compared to the own tax revenue in the later FC period. Most states displayed an upward trend in fiscal deficit for most years. It was less than 3% as a percentage share of NSDP for majority of the states while in the rest it is about 4%. However, it was noted that state budgetary deficits needs not be related to states per capita GSDP since states have some discretion in raising public debt within certain limits. In this case, fiscal deficit could be considered as an indicator for fiscal discipline. In regard to GST, it is too early to be able to present evidence based analytical insights. However, it is noted that there is a broad consensus of a positive pay-off from this tax reform in the literature, though it may be premature to make rigorous predictions on how much impact it will have on tax revenues.

7.2: Some Specific Recommendations

1. Centre-States allocation of resources: The balance in Indian fiscal system has steadily but significantly shifted in favour of states over the years. Attempts should be made in future to examine questions regarding relative efficiency in delivery of public services amongst states.
2. Inter-state inequality: In view of the rising inter-state inequality in per capita income, we have presented a normative welfare approach for resource transfers which takes into account the preferences for income redistribution in favour of the poorer states. This involves incorporation of an inequality aversion parameter in the income criteria for horizontal devolution so that relatively poorer states could get a higher share.
3. Population Stabilization: One of the SDGs is to stabilise the global population of world to 8 billion by 2030. The TOR of the 15th Finance Commission (15th FC) on measurable performance-based incentives for the States based on their efforts and progress in moving towards replacement rate of population growth is considered in conjunction with the

mandate for the 15th FC for using the population data of 2011. It is noted that some of the states lagging in population stabilization are also the ones with high share of population and, further, that population shares are used to weigh all the constituents of the horizontal transfer formulae. An attempt is therefore made to devise an indicator based on state level performance in population stabilization based on the TFR criteria, with replacement level of fertility at 2.1. State shares are accordingly computed. TFR can be used as a goalpost by empowering people by providing access to family planning services. As fertility is a complex multifactorial phenomenon, policy initiatives will have to be planned to motivate states to lower the TFR.

4. Forest Cover: The NDC target is to create an additional carbon sink of 2.5 to 3 billion tons carbon dioxide equivalent through forest and tree cover by 2030. In the context of proposing measurable performance-based incentives for States, at the appropriate level of government, in TOR 4 (iii) sustainable development goals have been mentioned while as in 3(ii), in making its recommendations, the Commission shall consider the demands on the resources of the Central Government on account of climate change, among other factors. For both the climate change implications and SDGs the forestry sector has an important role to play. In particular, it deserves special mention in the context of allocations made by previous FCs for forests, in particular the 14 FC incorporated dense forest cover as a criteria for horizontal devolution. In this context the study presents a data based analysis for comparing transfers based on horizontal devolution with those through a grant. Also, scenarios incentivizing states for maintaining forests and other valuable ecological resources (for instance, preservation of species outside dense forests as in grasslands for Asiatic lions in Gir, enriching soil carbon and enhancing tree cover outside dense forests) are compared with those based on accommodating the concern for fiscal disability. Based on the analysis, two proposals are made for expanding the definition of area to be considered for fiscal disability and for providing incentive based grants to improve forest cover. Further, a grant seems to be more in keeping with the achievement of specific objectives.

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