

**CENTRE–STATE FINANCIAL RELATIONS: A STUDY WITH
SPECIAL FOCUS ON GOA**

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By

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CERTIFICATE

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DECLARATION

I declare that the present thesis entitled '**Centre–State Financial Relations: a Study with Special Focus on Goa**' is a consolidation of an original work which has been carried out by me under the guidance of Dr. Pranab Mukhopadhyay at the Department of Economics, Goa University and that the same has not been submitted to any other University or Institution for award of any other degree, diploma or other such title.

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Chapter 1

Introduction

1.7 Background on Federalism

Federalism can be described as a principle of governance that explains the relationship between the government at the national level and its constituent units at the regional, state and local levels. Under this principle of government; power, authority and resources are divided between the national and local governments, in such a way that each tier of government is allocated an area of power and authority solely exercised by it, while other powers must be shared between governments (GoI, 2017). However, federalism does not mean any one particular distribution of authority between governments, but rather it is a process that is characterised by a set of institutions through which authority is distributed and redistributed between levels of government (Rodden, 2003). The word federalism originated from the Latin word *foedus*, which means "formal agreement or covenant" (Rodden, 2003).

The recent history of fiscal federalism in independent India can be traced back to the Government of India Acts of 1919 and 1935 during the British rule. While the Act of 1919 allowed for the division of revenue sources between the Centre and the provinces, the 1935 Act allowed for the sharing of Centre's revenues and for distributing grants-in-aid to provinces. The British had a highly centralized and a unitary political system during their rule in India. A strong Central authority was an important requirement for the British rulers both in their imperial as well as administrative endeavors. Hence in order to control India, the British government saw to it that power remained centralized during their rule (GoI, 2017).

At the time of independence there were strong arguments for decentralized governance in India and the planners initially wanted to entrust the Union with few powers. However, the Constitution that was finally implemented by the Indian Parliament had

"quasi-federal" features. This probably happened for two reasons: Firstly, the Muslim majority regions separated from India to form Pakistan and hence the main reason for a loose federal structure for India lost its importance. Secondly, it was felt by the planners that power needed to be concentrated at the Centre in order to protect against divisive tendencies among sub-national units (Chelliah, 1991). Hence, the decentralization system provided by the Indian Constitution was an experiment in applying a federal setup to a country that had huge inter-regional differences in terms of language, culture and socio-economic background. However, the planners of the Indian Constitution adopted many important features of the colonial rulers including a heavy central bias as well as the administrative and judicial structure of the British rulers (Rao, 2000).

1.8 Phases of Federalism in India

Though the Indian Constitution is federal in its setup, the planners deliberately described India as a Union and not a federation. This is because the planners felt that though the country comprised of different states purely for administrative convenience, however in reality these states and its people ultimately belonged to the same country governed by the Central government (GoI, 2017). Federalism in India can be basically classified into the following two phases.

1.2.1 Centralized Federation (1950s-1980s)

From 1950's right up to the 1980's, the entire power was concentrated at the Centre through a number of ways. One way was through the Planning Commission (PC). The PC was entrusted with managing the strategy of planning that was undertaken by the individual states with the objective of ensuring quick national development. The basic industries were reserved for the public sector and were mostly under Central control. There was also the system of heavy licensing that controlled the development of private industries in the country. There was nationalization of the insurance sector, aviation

sector and in 1969 of major commercial banks. The need to undertake large industrialization projects, the need to cover huge risks, and to undertake investment with large externalities were some of the reasons put forth to explain the Centre's direct involvement in economic activities of the states. However, the failure of centralized planning to sustain economic growth revealed the shortcomings of concentration of power at the Centre (Bagchi, 2003). While trying to manage and direct growth, the Centre is said to have crowded out private enterprise or any initiative on the part of the state governments (Bagchi, 2003). In fact according to Bagchi (2003), the character of India's federalism during its first phase has been a significant factor in contributing to India's poor economic performance. Managing the economy at the micro level from Centre directly or indirectly did not take into account the vastness and diversity amongst states and within states. Political concerns and interests outweighed economic rationale. For example, steel plants were established in places far away from the sources of raw material and despite having sufficient powers the Centre failed to promote a common market in the country where trade and commerce could be freely undertaken throughout the country (Bagchi, 2003).

1.2.2 Decentralized and Cooperative-cum-Competitive Federalism (1990 onwards)

With the liberalization of the economy in 1991 there was de-licensing of industries and states were given greater powers with regard to implementation of their industrial policies. Besides, states were given greater powers to follow their own social and economic priorities as well. With the emergence of coalition politics since the 1990's, states that had governments which were members of the ruling coalition at the Centre were able to wield considerable power in the Union government. Judicial rulings and coalition party politics have reduced the power of Article 356 of the Constitution that previously enabled the Centre to dismiss state governments. During this phase India moved towards cooperative federalism and decentralization finally took its firm roots.

Under Cooperative federalism different levels of government interact cooperatively and collectively to solve common problems. The significant feature of cooperative federalism is the key role it accords to state and local governments in the provision of public goods and services (Bagchi, 2003). At the same time, economists felt that there was a move towards market-determined borrowing for states in the 2000's and overall restraints on borrowing at the sub-national level. And hence it was felt that economy was moving towards the "Market Preserved Federalism" condition with the presence of hard sub-national government budget constraints (Singh & Srinivasan, 2005). It was also felt that there might have been a need for differential treatment of states as each state had needs and conditions that are particular to it. Thus, it was stated that federalism in India could also be described as "asymmetric" federalism in certain situations. However such intervention required to be strictly guided by rules and not political convenience (Bagchi, 2003). Hence after liberalization India advanced into a two-tiered federal structure with the powers, functions and resources set apart for the Union and the states (Rao, 2000).

1.9 Constitutional Division of Functions and Resources

The allocation of legislative powers in the Indian Constitution followed a federal structure with the idea to promote diversity along with the attainment of a single national objective (GoI, 2017). The main aim was to promote cooperation along with coordination, rather than dividing powers between different levels of government. This was to promote inter-dependence so that a balance was maintained between the functioning of independent states along with the presence of a strong Central government. As can be seen in Table 1.1, the legislative powers were divided into three different lists according to the Indian Constitution (GoI, 2017). The Union list comprised of matters that were of national significance, matters specific to certain regions were allotted to the State list and those that needed co-operative intervention

were allotted to the Concurrent list. The Union was entrusted with the residuary powers. In case of a situation of conflict in a concurrent jurisdiction the Constitution provides the Centre with overriding powers (Kalirajan & Otsuka, 2012)

Table 1.1: India's Constitutional Expenditure Assignments
List I Union List
(i) Country's defense, overseas dealings, overseas and public debt, International and Interstate trade and commerce, treaties, conferences, and social order on the high seas, international civil matters.(ii) Country's fiscal and monetary instruments inclusive of currency, Reserve Bank of India, Post Office Savings, lotteries, banking, insurance, stock, futures and derivative markets. (iii) Country's infrastructures which includes airways, railways, national highways and waterways, shipping & navigation, lighthouses, ports, posts & telegraphs, telephones, wireless, broadcasting. (iv) Matters related to Intellectual property rights, standards of weights and measures; regulation of exports and interstate Natural resources, cultivation, manufacture, and sale of opium for export. (v) Coordination and standardization of higher education and research, country's heritages and institutions, Union public services, All-India services, Census. (vi) Elections to Parliament and State Legislatures, Office of President, functioning of the Union government, Parliament and the Union judiciary, Audit of the finances of the Union and the States. (vii) Inter-state migration and quarantine Jurisdiction and control over all matters on List I apart from the Supreme Court. Any other function not mentioned in State or Concurrent List
List II State List
(i) Operation of State and local governments and State Legislatures, the State judicial and correction units and elections at the State level. (ii) Public goods and services like public health and sanitation, pilgrimages, social relief, regulation of liquor, burials & cremations, State public libraries & museums, communications not included in List I. (iii) regulation of Land, water, fisheries, gas, markets, fairs, inns, sports, entertainments,

gambling, incorporations other than those included in List I.(iv) Agriculture, Intra-State Trade and Commerce, State Public debt, Treasure trove Jurisdiction and control over all matters on List II apart from the Supreme Court.

List III Concurrent List

(i) Criminal laws & dealings about the items not included in List I & II, property transfers except for agricultural land; domestic civil laws regarding marriage, family etc. Contracting except for agricultural land; bankruptcy and insolvency, trust and trustees. (ii) Administration of justice other than Supreme Court and High Courts vagrancy, migratory tribes, country's environment, protection of animal and plants. (iii) Economic and social planning inclusive of family planning matters, matters related to social security and insurance, labor welfare, education, interstate public health, vital statistics , price control, charities and religions.(iv) Monopolies both commercial and industrial, trade unions, industrial and labor disputes, mechanically propelled vehicles, factories, boilers, electricity, and publishing presses jurisdiction and control over all matters on List III apart from the Supreme Court.

Source: (GoI, 2015)

Matters pertaining to areas of strategic and national importance such as the supply of money, international affairs, national security, atomic energy, national highways and those having sizeable economies of scale are assigned completely to the Centre. Matters with statewide and localized implications are given to states. Functions involving benefits across states and matters with major developmental potential have to be undertaken concurrently by the Centre along with the states. These include important areas such education and health (Table 1.1).

The concurrent list exhibits the federal structure taking into account heterogeneity and diversity amongst states. It provides the right balance between the uniformity in national laws along with accounting for the diversities and peculiarities of different states. The concurrent list comprises of such items of common concern that cannot be placed solely

under the jurisdiction of only states or the Centre (GoI, 2017). However in actuality, the unilateralism exercised by the Union government in implementing the powers that come under the concurrent list remains a serious reason for contention between Centre and states. Many economists have criticized concurrency as the Union undertakes expenditure on subjects in the concurrent list without proper discussion with the states, and that it is mainly done to enforce the power of the Centre rather than to strengthen co-operation with states (GoI, 2017).

Inclusion of economic and social planning in the concurrent list created a way that the Centre could intrude into the matters of the state. It bypassed the assignment scheme of functions of the Constitution, one of the key fiscal features that define a federation. While the states after liberalization definitely have more room to undertake their policies, the system of getting the states to have their "plans" approved annually by the Planning Commission continued till the scrapping of the Planning Commission in 2014. States had to draw up their "plans" to serve the objectives of the Central plan. Hence it was felt that though planning was originally meant to be undertaken in a decentralized manner, the actual involvement of sub-national governments in resource allocation had been limited (Kalirajan & Otsuka, 2012).

Besides this, states also were called upon to implement the Centrally-Sponsored Schemes designed by the Centre to mainly fulfill national priorities (Bagchi, 2003). Hence it was felt that there was an increasing "centralisation of expenditure" on state subjects. There is a trend by the Central government of getting increasingly involved on subjects of expenditure that are under the concurrent or the state list in the Constitution, sometimes through the state governments and sometimes bypassing them (Rangarajan & Srivastava, 2008). According to Bagchi (2003) in order to establish greater accountability, the concurrent list of expenditure functions should be re-analysed and

compressed so that there is no overlap of functions unless large externalities exist and the Centre's intervention becomes unavoidable.

Two important elements of federal finance are adequacy and elasticity. Adequacy means sufficient resources for undertaking the responsibilities assigned by the Constitution and elasticity means an expansion of finances along with the increasing needs of government. However the actual effect of the Constitutional division of tax powers has been that both these characteristics have been denied for states in India (Vithal & Sastry, 2001).

A vertical imbalance between the Centre and states is thus intentionally built into the Constitution by the provisions relating to powers of taxation. Certain countries like India and Australia have a system where the tax bases are totally separated between Central, sub-national and local governments. Some other countries have an arrangement wherein the same tax base can be taxed by various levels of government. Countries which have a considerable degree of sharing of the same tax base by different levels of government include USA and Canada (RBI, 2006). In India the tax powers are granted solely either to the Centre or the states. The most progressive taxes have been allotted to the Centre. The residuary tax powers have also been assigned to the Centre. It means that the subjects which have not been included either in the Union or in the State list may be taxed only by the Union government. While the Centre restricts itself to the taxation on manufacturing (excise duty); the states are entrusted with power to tax the sale of goods (Table 1.2). While states have the power to tax agricultural incomes and wealth, only the Central government can impose taxes on non-agricultural incomes and wealth (Rao, 2000). Taxation of agricultural incomes by states is not only seen as politically unsuitable but it also difficult to implement. At the same time, the separation of the tax base provides an easy way to avoid and evade personal income tax (Rao, 2000).

Goods and services tax (GST) was rolled out in India from July 1st 2017. Although GST was supposed to comprise of a single tax rate across states, the current GST tax structure has four different tax rates that is 5 percent, 12 percent, 18 percent and 28 percent with lower rates imposed on essential goods and higher rates on luxury items. GST is expected to make India one big common market by removing tax barriers across states. Another huge gain expected from GST is the removal of cascading effect of taxes involved in the cost of production (Bhagat 2017; Rao, 2017)

Table 1.2: India's Constitutional Revenue Assignments
Union List I
(i) Custom duties inclusive of export duties; excise duties, estate duty on property except for agricultural land, duties on property succession other than agricultural land. (ii) Terminal goods or passengers taxes carried by rail, sea, or air, railway fares and freights. (iii) Taxes on letters of credit and corporation tax, debentures. (iv) Taxes on the capital value of the assets, , insurance, except for stamp duties on transactions in stock and future markets, share transfers (v) Taxes on the purchase and sale of newspapers and advertisements taxes, taxes on the delivery of inter-state goods, trade or commerce; taxes on services; residuary tax powers not mentioned in List II; fees in respect of any of the items in List I.
State List II
(i) Duties on agricultural land succession; estate duty on agricultural land, excise duties on certain goods manufactured or produced in the state. (ii) Electricity taxes, land and building taxes, taxes on animals, vehicles and boats mineral rights taxes (iii) Sales tax excluding newspapers and advertisements, advertisement taxes except those appearing in newspapers. (iii) Entry tax for local consumer goods, tolls, Goods and passenger tax. (iv) Taxes on professions, trades, callings, and employment, capitation taxes; luxury and entertainment tax, taxes on gambling; rates of stamp duty with respect to documents except for those specified in List I

Source: (GoI, 2015)

Though the exclusive power of taxation of the Union and the state governments has been clearly stated, there are three other categories of taxation (GoI, 2015).

- a) The first category comprises of taxes that are imposed by the Centre but the states are allowed to collect and use them. Examples of such taxes include excise on toilet and medicinal items.
- b) Certain duties that are imposed and collected by the Union but the net proceeds of such taxes are distributed among the states. Each state gets that amount of the tax as is collected within its territory. Examples of such taxes are succession duty, estate duty on property other than agricultural land, taxes on railway fares and freights, taxes on newspaper sales and advertisements etc.
- c) Certain taxes that are levied and collected by the Union but the revenue from these taxes are distributed between the Centre and the states. These taxes include taxes on non-agricultural incomes and excise duties on items in the Union list, except medicinal and toilet preparations.

The Constitution has also clearly specified the borrowing powers of the Central and sub-national governments. The states are allowed to borrow from the Central government as well as from external sources at the market rate. However, if a state has taken loans from the Central government, it has to seek the Centre's permission if it wants to further borrow from the market. Since most states borrow heavily from the Central government, the borrowing by the states is mainly controlled by the Ministry of Finance, the Reserve Bank of India and the Planning Commission (when it was in existence) (Kalirajan & Otsuka, 2012). The states can borrow from public accounts as well and the main item under this is the share of small savings loans and public provident fund. Basically through this provision the Constitution tried to allow the Central government to have control over the state borrowing. However, in reality, the states are able to borrow from the market as well (Rao, 2000).

1.10 Institutions to Address Fiscal Imbalances amongst States

Since the mismatch of the states' fiscal resources and its responsibilities had been foreseen by the planners at the time of framing the Constitution, the following institutions to deal with these concerns had been put in place

(a) According to Article 280 of the Indian Constitution, the President of India is entrusted with task of appointing the Finance Commission (FC) for a period of five years, to deal with the vertical imbalances in fiscal resources and expenditure responsibilities between the Centre and states and to determine the share of resources to be distributed horizontally among the states (FC, 2009). Since the Indian Constitution came into effect, Fourteen Finance Commissions have submitted their reports as at the time of submission of this study (FC, 2009). The Fourteenth FC covers the time period 2015 to 2020 and the Fifteenth FC has only just been notified.

(b) On March 15, 1950, the Indian government passed a resolution by which the Planning Commission (PC) was instituted in order to make an evaluation of the material, capital and human resources of the country and to develop a plan for efficient and balanced employment of the country's resources (PC, 2004). Since the inception of the PC till 2014 it has undertaken twelve Five Year Plans in India. The Twelfth Five Year Plan was for the time period 2012-13 to 2016-17, however in August 2014, midway through this Plan the Government of India scrapped the Planning Commission (HT, 2014)

(c) A National Development Council (NDC) was instituted in August 1952 to support Five year plans, assess the progress of the National Plans and suggest measures for achieving Plan objectives. In fact, the secretary of the PC also acted as Secretary to NDC and the PC was expected to provide administrative and any other assistance as required by the NDC. The NDC comprised of the Prime Minister, Union Cabinet Ministers, Chief Ministers of all States and Union Territories as well as members of

the PC. Setting up of the NDC was considered as one of the most significant measures to increase understanding and consultation between the Union and state Governments on planning and other common economic problems (MHA, 2017). Since the PC has been dismantled there has been a move to dismantle the NDC as well however till date there has not been any notification (ET, 2016; IE, 2017).

The functions of the FC comprise of the following (FC, 2009)

- (a) The determination of the vertical distribution of sharable taxes between Centre and the states as well determination of the sharable taxes between states
- (b) Distribution of grants-in-aid to the states
- (c) Suggest ways to improve finances of the state government in order to enhance the finances of the local bodies
- (d) Look into any other matter referred to the Commission that will encourage healthy fiscal behavior of governments.

The PC too had assisted states financially to fund their developmental plans until 2014. The assistance was given both in terms of grants as well as loans in the ratio 30:70 for the general category states and 90:10 for the special category states (PC, 2008). The special category states include Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand. The general category states include Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Tamil Nadu, Rajasthan, Uttar Pradesh, West Bengal and the newly formed state of Telangana. This categorization of special and non-special category states was determined by the NDC. Special category status was given to states based on certain criteria such as low resource base, mountainous and tough geographical land, low population density, large share of tribal people, hostile location along borders with neighboring countries and little scope for undertaking economic activities (FC, 2009).

The functions of the PC till its replacement by the Niti Ayog could be summarized as follows (PC, n.d.):

- (a) Formulate Five Year Plans, set economic growth targets and strategies
- (b) Discussion with the state governments regarding their respective state plans and put forth recommendations with regard to distribution of Central assistance to the state plans as well as providing inputs while developing Centrally sponsored schemes.
- (c) Recommendation for disbursement of funds for Central sector schemes
- (d) Assessment of large projects and schemes including private public partnership projects.
- (e) Putting forth infrastructure targets, monitoring key sectors and sorting out inter-ministerial problems
- (f) Secretariat to support NDC.
- (g) Advice on important economic policy matters
- (h) Evaluation of government programmes.

Besides the FC and PC, Central Ministries provide funds to the states in the form of Central schemes. States undertake expenditure on behalf of the Central Ministries who entirely fund the Central sector schemes. On the other hand the costs are shared in terms of Centrally Sponsored schemes (CSS) between the Centre and states. Here states are required to make matching contributions, the matching ratio differs according to the projects (Rao & Singh, 2001).

Thus the transfers from the Centre to the states can be classified as follows:

- (1) Devolution of states share in Central Taxes from the FC
- (2) Grants from Centre to the states which are classified as statutory or non-statutory; and plan as well as non-plan which include the following:
 - (i) Non-Plan grants, comprising – (a) Statutory grants disbursed by the FC to cover gap in revenue; (b) Assistance for relief measures after natural calamities

(ii) Non Statutory grants as follows: (a) State and Central plan schemes (b) Centrally Sponsored Schemes (c) Special schemes (North eastern states) etc.

(3) Loans from Centre (Plan and Non Plan) (FC, 2009; PC, 2008).

Besides these transfers mentioned above there are transfers that are implicit in nature. These implicit transfers are mainly a result of regulation of prices undertaken by the government. The main type of implicit transfers are subsidized loans given by the Centre to the states. Besides, implicit transfers also include subsidized loans provided to priority sectors by the banking sector (Rao, 2000). Such implicit transfers are not examined in this study.

The PC was replaced by another institution known as NITI Aayog in August 2014. The full form of NITI is National Institution for Transforming India. It was conceived as a 'Think Tank' of the government. NITI Aayog is expected to provide strategic and technical advice to the governments both at the Centre and the states on key policy matters. It includes issues of national and international economic relevance, propagating best national and international practices, new policy ideas and specific issue-based support. The idea to restructure the PC by the government arose due to the need to match the government's ideology (which wants to promote cooperative federalism) with the policies that are being undertaken in the country. The members of the NITI Aayog include Chief Ministers of States and & Lieutenant- Governors of UTs and is expected to foster a spirit of cooperative federalism (Chatterjee, 2015). However, although states and UTs are represented in NITI Aayog it is not very clear whether they can approve or reject NITI Aayog's proposals. There is no clarity whether NITI Aayog can determine the transfers or funding to states as was done by the PC. Soon after the PC was dismantled its functions were taken over by the Ministry of Finance (The Hindu, 2015).

1.5 Third tier Level of Governance in India

The Community Development Programme (CDP) recommended by the Balwant Rai Mehta Committee was started in the First Five Year Plan and was the first move towards decentralization in independent India (Alagh, 1999; Jha, 1999). Consequently, the NDC approved a three-tier system of decentralization in 1958. Different states pursued different models for the formation of local bodies.

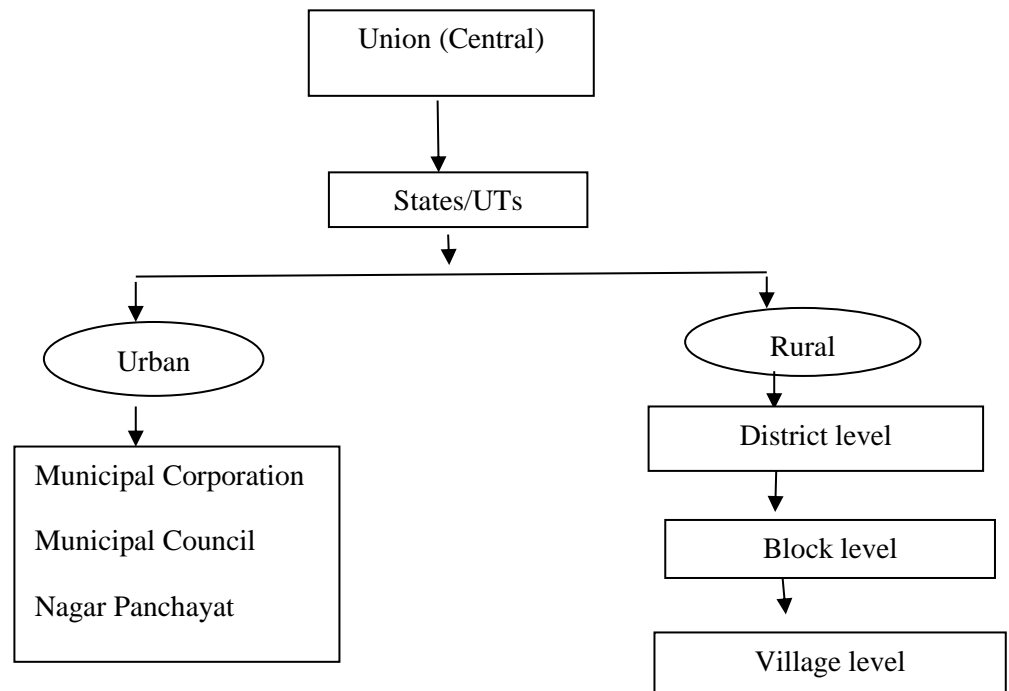
The progress of three tier system of governance was slow for several reasons. Political resistance at the state level who were not willing to share powers and resources hampered the progress of an effective decentralized system (Rao, 1989). Lack of funds also hampered the effective functioning of local bodies. To add to this there was complete lack of clarity about the responsibilities and functions of these bodies and hence most of these local bodies functioned as mere units of administration without any real powers. It was in the 1960s and early 1970s, that the Ashok Mehta Committee proposed that the entire structure of Panchayati Raj institutions should be redone in order to undertake rural development programs more effectively (Alagh, 1999). Consequently states like Gujarat, Jammu and Kashmir, Karnataka, Maharashtra and West Bengal took many major steps towards decentralization at the local level. However large states like Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh, where decentralized planning was required more due to their large size, did not take any important steps towards decentralization at the local level. Even in states like Gujarat and Maharashtra which were one of the first in undertaking decentralization at the local level, effective devolution was extremely inadequate. A relatively better system of decentralized governance was seen in Karnataka, West Bengal, and Jammu and Kashmir (Rao, 1989). Karnataka and West Bengal undertook legislation to empower elected local bodies with greater power and resources.

The mid-1980s saw a lot of support for decentralization, which paved the way for the Panchayati Raj Bill in 1989. This Bill gave discretionary political freedom to states to devolve functions and resources to Panchayati Raj institutions (PRIs). Finally in 1992 through the 73rd and 74th Constitutional amendments, local bodies in India got Constitutional status. By these amendments, states had to mandatorily form elected local bodies. Panchayats and Urban Local Bodies (ULBs) became the units of local self-government. Thus finally in 1992 a three tiered system of federalism actually evolved in India (Asfaw et al., 2007).

The decentralisation envisioned in the Constitutional amendments had the objective of making rural local bodies self-governing units with the capacity to significantly ameliorate the efficient delivery of public goods and services in the country (Rao et al., 2011). With this 73rd amendment, each of the state governments had to establish PRIs through the necessary legislation. Each state had to create three levels of rural local governments at village, Taluk (block) and district levels (Figure 1.1). The Ministry of Panchayati Raj was established in 2004 to enact and implement various policies and plans (Jha et al., 2015).

The evolution of Urban Local Governments was also on similar lines as that of PRI's. The Constitutional recognition of the ULBs was through the 74th amendment in 1992. The ULBs consist of Municipal Corporations in large cities, Municipalities or Municipal Councils in smaller cities and towns and Nagar Panchayats (Asfaw et al., 2007). The decentralized structure of federal India can be illustrated in Figure 1.1

Figure 1.1: The Decentralization Structure in India



Source: (Asfaw et al., 2007)

Accordingly in line with amendments, a list of 29 subjects for PRIs and another list of 18 subjects for ULBs were proposed to be transferred to them by states. However the revenue and expenditure responsibilities in the lists overlapped with the states' responsibilities and the actual assignment of these functions was left to the state governments. Hence the extent of decentralization of local bodies has seen a wide variation across the country depending on the extent that the states were willing to decentralize.

State governments had to set up a State Finance Commission (SFC) to analyse the revenue of the local bodies and accordingly allocate tax shares and grants. The responsibilities of the Commission include the following (World Bank, 2000a)

- (a) Allocation of the state finances between the state and local governments as well as determining the share of individual local governments.
- (b) Allocation of revenue powers to PRI's and ULBs
- (c) Determining the amount of state grants to local governments.

Most states formed SFCs, which submitted their reports in less than two to four years since they were setup. The SFC's did not follow any common approach while determining the allocation across the country except that most SFC's suggested transfer of finances according to the existing tax powers of the local governments. In fact due to the lack of clarity regarding transfer of functions by states, all SFCs could not really assess the resource requirement of the local bodies (World Bank, 2000a).

SFCs in different states followed different ways of determining the resource requirements of PRIs. However all SFC's strongly recommended that whenever state governments devolved any of the functions as proposed in the Schedules they must also devolve sufficient finances so that local bodies are empowered to discharge their responsibilities effectively (World Bank, 2000a). Besides state transfers based on the recommendations of the SFCs, the Central government also gives grants based on the recommendations of the Union Finance Commission (Rao et al., 2011). There are also a number of Central sector and Centrally sponsored schemes that are being undertaken by local governments and the funds are given to them through the state governments and sometimes directly from the Central government (Rao, 2000).

Despite Constitutional recognition, the design and implementation of decentralization does not enable the Rural and Urban Local Bodies to be self-governing units. Both in terms of revenue raised and expenditures incurred, local bodies play a negligible role. Despite constitutional amendments, local bodies still do not have autonomy in their spending decisions. One of the main causes is due to the discretionary nature of the devolution of powers and resources to local bodies depending on the willingness of state governments (World Bank, 2000a).

1.6 Drawbacks of Federalism in India

There have been some negative outcomes associated with cooperative federalism, particularly coordination failure amongst the sub-national governments and Central

government as well as the prevalence of fiscal indiscipline amongst sub-national governments. In India for example after some improvement was seen in state fiscal balances immediately after the 1991 reforms period, the fiscal situation worsened for almost all states due to heavy debt burdens. The fiscal imbalances had increased greatly both at the state and Central level (Bagchi, 2003). On average the outstanding liabilities as a percentage of GSDP of 14 major states increased from 21 percent during the pre-reform period to 27 percent in the 1990's and 31 percent in 2000's (Table 1.3). Although there was an overall average increase in the outstanding liabilities in the 2000's mainly due to the increase of outstanding liabilities during the initial years of this decade, however almost all states witnessed a decline in their outstanding liabilities as a percentage of GSDP after the implementation of the FRBM act in the respective states.

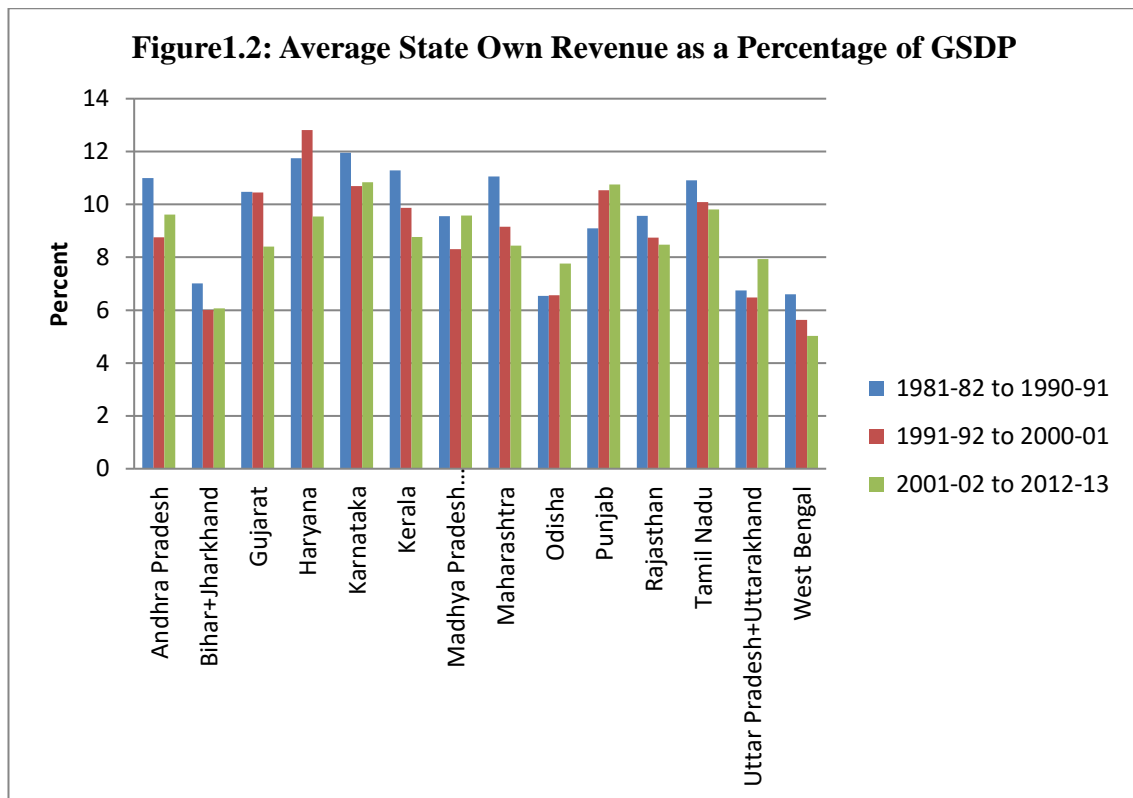
States	1981-82 to 1990-91	1991-92 to 2000-01	2001-02 to 2012 -13
Andhra Pradesh	19	21	27
Bihar +Jharkhand	27	56	57
Gujarat	16	22	28
Haryana	18	19	19
Karnataka	17	18	22
Kerala	24	26	30
Maharashtra	14	17	23
Madhya Pradesh +Chhattisgarh	20	21	26
Odisha	31	38	36
Punjab	21	33	37
Rajasthan	30	28	35
Tamil Nadu	15	18	20
Uttar Pradesh +Uttarakhand	22	32	40
West Bengal	19	23	39
Source: (EPWRF, Various Years; MOSPI, Various Years)			

During the 1990's the public services decayed while states in distress continued to undertake unproductive wasteful expenditure programs. Many of the state-owned

enterprises continued to exist with large interventions from state governments, despite not serving any useful purpose (Bagchi, 2003). Very little expenditure was kept aside as capital expenditure which is the more productive expenditure by the states. In the 1980's the average revenue expenditure of all the 14 states as a share of the aggregate expenditure was 74 percent. It increased to 83 percent in 1990's and declined to 79 percent in 2000's (Table 1.4). Again the decline in the revenue expenditure as a percentage of aggregate expenditure can be attributed to the implementation of the FRBM Act.

Table 1.4: Average Revenue Expenditure as a Percentage of Aggregate Expenditure			
States	1981-82 to 1990-91	1991-92 to 2000-01	2001-02 to 2012-13
Andhra Pradesh	80	80	75
Bihar +Jharkhand	70	87	77
Gujarat	72	80	76
Haryana	71	84	80
Karnataka	75	82	77
Kerala	77	85	86
Maharashtra	78	82	80
Madhya Pradesh +Chhattisgarh	74	85	75
Odisha	72	80	80
Punjab	64	82	84
Rajasthan	71	78	79
Tamil Nadu	76	88	79
Uttar Pradesh +Uttarakhand	71	81	77
West Bengal	79	84	83
Source: (EPWRF, Various Years; MOSPI, Various Years)			

Tax competition was resorted to amongst states in order to attract business and trade which slowed down government revenue growth. Inadequate realization of user charges in water and power services led to further reduction of state revenue resources (Bagchi, 2003).



Source: (EPWRF, Various Years; MOSPI, Various Years)

For 10 out of the 14 states the average state own revenue as a percentage of GSDP was less in the 2000's as compared to the pre-liberalization period. The states which had the highest share of state own revenue as a percentage of GSDP were Punjab and Karnataka at 11 percent during 2001-02 to 2012-13. The state with least value was West Bengal at 5 percent followed by Bihar at 6 percent (Figure 1.2).

Clearly, Constitutional provisions could not be held liable for the adverse state fiscal balances. Broadly, the causes are rooted in the functioning of the political institutions (Bagchi, 2003). In the absence of a well designed and transparent transfer system, federalism incentivizes fiscal indiscipline among sub-national governments, putting at risk macroeconomic stability of the country. There are shortcomings in India's transfer system. The 'gap-filling' approach followed by some of the FCs together with soft budget constraints for the states led to adverse incentives (GoI,2017). When states were allowed to borrow heavily from the Centre, there was an inherent expectation that the Centre will bail them out from time to time. This led states to fund even current

expenditures through borrowing from the Centre and other sources as they expected that either a gap-filling grant or a debt-service write off would bail them out in future (Rangarajan & Srivastava, 2008). Some economists view federalism as “a constitutional bargain among politicians” to achieve political objectives (Rao & Singh, 2001). Even in India it was felt that though the FC and even some transfers of the PC were devolved using transparent formulae, there were many transfers that were disbursed in a discretionary manner and may be subject to political factors (Bagchi, 2003). It was only after the implementation of the Fiscal Responsibility and Budget Management (FRBM) Act since 2002-03 in respective states and other similar measures initiated around the same time that states began reporting improvements in their fiscal situation. Hence if proper institutions are in place there can be efficient functioning of a decentralized economy.

1.7 Statement of the problem

The stability of India as a nation depends critically on its federal structure (Bagchi, 2003). The introduction of market oriented reforms since 1991 has necessitated an examination of fiscal relations between the Central and state governments and its impact on key economic indicators (Rao, 2000). Despite so many years of decentralization being undertaken in the country in the delivery of public goods and services, not many empirical studies have been undertaken in India to understand the impact of decentralization on major economic indicators at the state level. Among the few studies, Jin (2009) assesses the impact of decentralization at the state level on economic growth from 1980 to 2005 using 29 Indian states. However there is a difference in the way the author calculates the expenditure decentralization as compared to our study. Jin (2009) computes decentralization at the state level by including the aggregate expenditure at the state level inclusive of Central transfers. However more recent studies deduct those expenditures from state government expenditures in order to compute the true measure

of fiscal decentralization (Akai & Sakata, 2002). Our study tries to compute an indicator of fiscal decentralization using expenditures over which the governments have autonomy and is an improvement over Jin (2009). We find that there is a gap in the literature with regard to the impact of decentralization on fiscal balances in India. While there are some international studies in this area, our study tries to fill this gap for India. There is also a need to assess fiscal decentralization in India at the local level. Decentralization at the local level has not been uniform across states with different state governments undertaking differing levels of decentralization at the local level. It is important to examine the extent of local decentralization achieved in different states and its impact on economic indicators (Rao, 2000). Two previous studies have used econometric models to understand the impact of decentralization on major socio-economic indicators at the local level in India. Kalirajan & Otsuka (2012) studied 25 Indian states to understand the impact of rural decentralization at the local level on agricultural share of GSDP for the time period 2000-01 to 2002-03. Asfaw et al. (2007) in their study tried to understand the influence of decentralization between 1990 and 1997 on infant mortality rates in rural India. Hence both the studies are mainly focussed on the impact of rural decentralization on socio-economic indicators. However there is a gap in the literature on the impact of overall decentralization at the local level that is inclusive of ULBs and PRIs and our study tries to fill this gap.

We also undertake a detailed study of the extent of decentralization in Goa at the third tier level of governance and its impact on its Gross State Domestic Product (GSDP). Our study is the first of its kind for Goa. While there is an individual Panchayat level analysis (Karmali, 2015), there is no study which has undertaken an overall view of the extent of decentralization. Goa is a high income state with relatively smaller population and area. Therefore it would be helpful to know the contribution of decentralization at the local level to its GSDP.

In 1991 there was a shift from centralized planning which enhanced the role of state governments in providing social and physical infrastructure. There were also disparities in resources and expenditure needs across states that necessitated greater Central role through inter-governmental transfers. While loosening of Central control clearly gave a boost to the growth momentum of the economy, inter-state disparities and fiscal imbalances in the states increased as well (Bagchi, 2003). If the states can simply get larger transfers due to their increasing expenditures, it could increase their overall deficit (Rao, 2000). Our study investigates the disincentives that transfers create for the tax effort and fiscal deficit amongst states. The impact of Central transfers on fiscal deficit has been studied by Bhatt & Scaramozzino (2013). They examined the causality between federal transfers and fiscal deficits using a panel dataset in India from 1990 to 2010. We improve upon these results by using a fixed effects two stage least square instrumental variable model on a panel dataset for the time period 1981-82 to 2012-13.

With regard to impact of transfers on state tax effort there are quite a few studies that have been undertaken in India (Dash & Raja, 2013; Naganathan & Sivagnanam, 2000; Panda, 2009). However these studies fail to disaggregate the transfers according to the type of institution by which they are determined and whether these are formula based or discretionary transfers.

According to Rao & Singh (2001) transfers in India are determined by a complex host of factors which includes constitutional assignments, institutional precedents, discretion and negotiation. There have been empirical studies that have analysed the impact of political variables on Central transfers to the states (Biswas & Marjit, 2014; Garg, Goyal, & Pal, 2014; Khemani, 2003; Rao & Singh, 2001; Singh & Vashishtha, 2004). We study a longer time span and offer a methodological change over these studies. The net proceeds of Central taxes are considered to be the principal resources from the Centre to states (FC, 2009). Different FCs have used different criteria for the

devolution of shareable taxes to states which are formula driven. However there have been many recommendations by individual states asking to change either the existing weights or the criteria used by the FCs as they feel that the existing weights and criteria provide wrong incentives to states. Earlier FCs have not used any outcome indicators in the devolution formula to determine Central transfers to states. Our study attempts to fill these gaps. The broad objectives of our study are:

1.8 Objectives of the study

- 1) To analyse how decentralization has impacted on growth and development in India.
- 2) To assess whether transfers act as a disincentive to tax effort by states and whether these transfers are influenced by lobbying.
- 3) To examine whether an incentive or outcome based allocation rule for devolution of finances by Finance Commissions would be a better alternative.

With these broad objectives we now state the specific research questions that we would like to examine in our study.

1.9 Research Questions

This study proposes to address these issues by investigating the following research questions:

- i) What has been the extent of decentralization that has been undertaken in India at the sub-national level and sub-state level?
- ii) Has India benefited from fiscal decentralization at the sub-national level in terms of enhancing the Gross State domestic product and fostering fiscal discipline amongst states?
- iii) What has been the impact of the fiscal decentralization at the sub-national level on outcome indicators?

- iv) What has been the extent of decentralization at the third tier level of governance with specific reference to Goa?
- v) What has been the impact of transfers on fiscal deficit and tax effort amongst the states?
- vi) Are the Central transfers that are disbursed to states influenced by political factors?
- vii) If we introduced outcome indicators and changed the weights and variables used by the Finance Commission how would it alter the shares received by states?

1.10 Data

The study makes use of a panel data set of 14 major non-special category states for the time period 1981-82 to 2012-13. All the data used in our study is in current prices. Data on all types of expenditures, fiscal and revenue deficit, interest payments, different types of inter-governmental transfers have been taken from the Economic and Political Weekly Research Foundation database. Data on Gross State Domestic Product (GSDP) is from the Government of India, Ministry of Statistics and Programme Implementation. GSDP data from 1980-81 to 1992-93 is based on the 1981 series, data from 1993-94 to 1998-99 is based on the 1993-94 series, data from 1999-00 to 2003-04 is based on the 1999-00 series and finally data from 2004-05 to 2012-13 is based on the 2004-05 series. Data on infant mortality rate, literacy rate and poverty is taken from Government of India, Planning Commission. The data on poverty is based on the NSSO rounds as follows - 68th (2011-12), 66th (2009–2010), 61st (2004–2005), 55th (1999–2000), 50th (1993–1994), 43rd (1987–1988), 38th (1983) and 32nd (1977-78). Data on sex ratio is from the Government of India, Ministry of Home Affairs. State-wise data on the third tier level of governance is taken from Indiastats which claims its original source as the Report of the Twelfth Finance Commission, 2005-10. Data to compute political variables is obtained from the Election Commission of India, (Various Years). Data on

forest cover is from the Forest Survey of India, Ministry of Environment and Forests. Data on Central expenditure and transfers is taken from the Government of India, Ministry of Finance. Data on Central taxes is taken from the Reserve Bank of India. Data on expenditure and revenue components of local bodies in Goa is taken from Government of Goa, (Various years).

1.11 Structure of the thesis

The present study is composed of eight chapters. The present (first) chapter is the introductory chapter of the study. This chapter provides a general outline and the structure of the study. It states the objectives of the study, puts forth the research questions addressed in the study and states the data used in the study. It also provides a brief summary of the chapters included in the thesis

The second chapter entitled “Fiscal decentralization and Fiscal Equalization” summarizes the theoretical and empirical developments in the area of fiscal decentralization and fiscal equalization. The objective of this chapter is to identify the research gap that exists in the literature and to identify methodological and measurement problems in the previous studies.

Chapter three is titled “Research Methodology” and it gives a detailed description of the econometric issues and methods that are commonly used for panel data analysis. This chapter also explains the different measures used to determine inter-regional inequalities.

Chapter four entitled “Impact of fiscal decentralization” is divided into two sections. The first section deals with different measures of fiscal decentralization and provides a quantitative analysis of the extent of decentralization. The second section looks at empirical models and the findings of the impact of fiscal decentralization on economic and development indicators.

Chapter five entitled “Inter-governmental transfers amongst non-special category states in India” tries to understand the extent of fiscal equalization achieved amongst the 14 non-special category states in India as a result of inter-governmental transfers. The chapter also tries to empirically analyse the impact of political factors on the disbursement of inter-governmental transfers to states and the consequences for fiscal imbalances and state tax effort.

Chapter six is titled “Fiscal decentralization at the third tier level of governance with special reference to Goa”. This chapter tries to measure the extent of decentralization undertaken at the third tier level of governance for 14 non-special category states in India. It tries to test empirically the impact of fiscal decentralization at the third tier on Gross State Domestic Product. The second part of the chapter tries to understand the impact of fiscal decentralization that is undertaken in a high income state like Goa at the local level. It undertakes a taluka-wise quantitative analysis of the expenditure and revenue components at the local level in Goa. Lastly it tries to understand the extent of expenditure inequalities of Village Panchayats across talukas in Goa.

Chapter seven entitled “Impact of alternative devolution weights” experiments with the weights and variables used by the Thirteenth and Fourteenth Finance Commissions in order to find out their impact on respective shares of states. The study tries to see how the shares of states would change if they were rewarded for the improvement on social and environmental indicators.

Chapter eight concludes the thesis. This chapter will summarize the major findings of the study.

We now turn to the second chapter of our study.

Chapter 2

Fiscal decentralization and Fiscal Equalization

2.1 Introduction

It is often stated that an identical set of policies differ in effectiveness across states within a country due to constraints posed by institutional and organizational factor heterogeneity. Fiscal decentralization is cited to be one of the major institutional factors directly involved in the delivery of public services and in implementation of development policies (Kalirajan & Otsuka, 2012). It is felt that higher levels of human development can be obtained even with the given structure of the economy, by merely improving the delivery system (PC, 2008). Therefore, a better understanding of the extent and process through which various forms of decentralization contribute to development may be the key to enhancing the efficiency of policies that are being undertaken in the country. In fact, economic efficiency in governance can be improved by allocating functions across governmental levels based on their comparative advantage (Oommen, 2006). Thus if fiscal decentralization is indeed growth enhancing then without changing the total budget share in the GSDP, growth can be improved by re-allocating the expenditure responsibilities across different levels of government.

Randinelli & Nellis (1986) have put forth four popular typologies of decentralization: devolution, delegation, deconcentration, and divestment (or privatization). Deconcentration means that the Central government allocates responsibilities for certain services to its regional offices. This does not involve any real transfer of power to sub-national governments and thus will not lead to the potential advantages or pitfalls associated with decentralization. Delegation refers to the transfer of responsibility by the Central government for decision making and administration to local governments. Here local governments are not wholly controlled by the Central governments but are

ultimately accountable to it. Divestment is the transfer of public services and institutions to private companies. Lastly devolution is the transfer of power by the Central government for decision-making, finance, and management to nearly independent units of local government. Thus devolution actually comprises of empowering sub-central governments with autonomy in spending decisions and revenue collection (Sharma, 2006).

The first wave of decentralization that began in the 1950's and 1960's focused on administrative decentralization amongst countries, which meant merely delegating responsibilities funded by the Centre to local governments. The second wave of decentralization from the mid-1970's up to 1980's attempted to devolve central government responsibilities and revenue sources to local governments. As it was realized that decentralized planning with increased local participation was more effective in implementing development programs targeted at meeting basic needs, such as health and education. However, local governments were often given a greater share of responsibilities but not the revenue sources. The third wave of decentralization which is ideologically driven is based largely on the principle that in an increasingly globalized economy states need to be more market oriented. The third wave mainly focuses on the fiscal devolution model of decentralization (Lindaman & Thurmaier, 2002).

2.2 Definitions and Measures of Decentralization used in Empirical

Papers

Decentralization at the sub-central and local levels is a phenomenon involving fiscal, administrative and political aspects and can take many forms. Political decentralization refers to the transfer of legislative powers from Union government to democratically elected lower level governments that are autonomous in nature. Administrative decentralization comprises of the transfer of planning and implementation

responsibilities to elected local governments. Fiscal decentralization can be understood as a transfer of revenue and expenditure autonomy to local governments (World Bank, 2000b). Decentralization is thus multi-dimensional, that is there are many aspects of a country's fiscal system that can be decentralized (Martinez-vazquez & McNab, 2003). It is quite probable that an economy may be decentralized in some aspects, not in others (Bardhan, 2002). There are many different ways in which decentralization is defined and it differs across countries and thus it has to be contextually defined and understood (Bird & Vaillancourt, 1998). It is necessary to define decentralization in order to understand its effects on economic growth (Akai & Sakata, 2002). In order to measure the effects of decentralization on economic growth we need to derive a quantitative measure of decentralization based on the definition used. However, according to Akai & Sakata (2002) only a single indicator cannot fully capture the various aspects of decentralization. To get a reliable result that can be generalized it is essential to construct different measures of decentralization. These measures should encompass different aspects of decentralization even beyond the field of economics (for example, governance and administration). We have tabulated the various definitions of decentralization as well as their corresponding measures that have been used in earlier empirical studies (Table 2.1). The table is further classified into decentralization at the third tier level of governance (local government) as well as the sub-national government.

Table 2.1: Definition and Measures of Decentralization			
	Author (Date)	Definition of Decentralization	Measure
Decentralization at the third tier level of governance (Local Bodies)			
1	Oommen (2006)	Fiscal decentralization comprises of empowering local governments with taxing and spending powers aimed at reducing mismatches in	(i) Expenditure Decentralization: The total expenditure of local governments, divided by the combined expenditure of state and local government.

		resources and responsibilities of local governments.	(ii) Tax decentralization: The own tax revenue of local bodies divided by the combined tax revenue of the state and local governments (iii) Autonomy: The ratio of own revenue to total expenditure. The author assumes that if a local government covers fifty percent of its expenditure through own revenue, it should be considered as autonomous.
2	Kalirajan & Otsuka (2012)	Decentralization is defined as the devolution of revenue, expenditure and decision-making authority to democratically elected local governments, which are largely independent of Central government (World Bank, 2000a).	(i) Rural decentralization measured as per capita expenditure of Panchayati Raj Institutions divided by per capita expenditure of Urban Local Bodies. (ii) The share of state's revenue inclusive of statutory transfers divided by state's expenditures
3	Asfaw et al. (2007)	Decentralization is defined as the transfer of responsibilities between levels of government through several fiscal, political and administrative instruments.	(i) Decentralization index was developed using factor analysis for the following variables: Panchayat expenditure in the total state expenditure, Panchayat expenditure per capita, Panchayat own revenue divided by total Panchayat expenditure. (ii) Political decentralization index was developed using factor analysis for the following variables: voters' turnout, women's involvement in polls, and the number of polling stations divided by its electors.
Decentralization at the Sub- national Level			

4	Qiao, Martinez-Vazquez, & Xu (2008)	Expenditure decentralization can be described as a decrease in the share of the Central government expenditures in total government expenditures	<p>Fiscal decentralization is calculated by dividing provincial fiscal expenditure to total fiscal expenditure in per capita terms as follows :</p> $\text{Decentralization}_{it} = \frac{\frac{LX_{it}}{POP_{it}}}{\frac{LX_{it}}{POP_{it}} + \frac{CX_t}{POP_t}}$ <p>Where CX_t is Central expenditure, POP_t is the total population and LX_{it} is the provincial expenditure and POP_{it} is the provincial population.</p>
5	Falch & Fisher (2012)	Decentralization is described as the percentage of sub-national government spending in total government spending.	Same as definition
6	De Mello (2000)	Fiscal decentralization is the devolution of expenditure and revenue powers to state governments including fiscal policy-making authority. The latter includes more autonomy in debt management, tax administration, and budget implementation.	Sub-national government size
7	Lin & Liu (2000)	Fiscal decentralization means the surrendering of fiscal powers by the Central government to sub-national governments.	Marginal retention rate is the rate at which revenue increments are kept by provincial governments
8	Lindaman & Thurmaier (2002)	Decentralization comprises of deconcentration, delegation,	i) Sub-national expenditures divided by total government expenditures

		privatization and devolution as defined in the section 2.1	<p>minus national social security and military expenditures.</p> <p>ii) Sub-national revenues inclusive of Central transfers divided by total government revenues net of international aid grants to the Central government</p> <p>iii) Sub-national revenues net of Central transfers, divided by total government revenues net of international aid grants to the Central government.</p>
9	Jin & Zou (2002)	Fiscal decentralization occurs when a Central government gives up its fiscal powers and responsibilities to sub-national governments.	<p>(i) Expenditure decentralization is measured as sub-national expenditure divided by total government expenditure</p> <p>(ii) Revenue decentralization is measured as sub-national own source revenue divided by total government revenue</p>
10	Zhang & Zou (2001)	Fiscal decentralization can be determined by the relative sizes of local and Central government expenditure and revenue.	<p>(i) Total provincial expenditure divided by total Central expenditures in per capita terms</p> <p>(ii) Provincial budgetary expenditures divided by Central budgetary expenditures in per capita terms</p> <p>(iii) Provincial extra-budgetary expenditures divided by Central extra-budgetary expenditures and this ratio is divided by the income.</p>
11	Akai & Sakata (2002)	Fiscal decentralization can be understood as empowering	(1) Decentralization indicator measured as the mean of the ratio of

		local governments with greater decision making powers.	local revenue to the sum of sub-national and local revenue and ratio of local government spending to combined state and local government spending. (2) Autonomy indicators: (i) Own revenue of the local government divided by total revenue, minus federal grants from both revenues (fiscal independence at the local level). (ii) Local government own revenue divided by total revenue, with both revenues containing Central grants (actual independence from the state government).
12	RBI (2006)	Fiscal decentralisation consists of the shift of Central spending and revenue functions to the states	Level of decentralisation can be measured by the extent of autonomy given to state governments by the Central government.
13	Jin (2009)	Fiscal decentralization is the transfer of fiscal powers and responsibilities from the Central to state governments.	Expenditure decentralization is the ratio of state government expenditures to total government expenditures.

Hence most of the definitions in Table 2.1 are expressed in terms of fiscal decentralization and though specified differently basically state the same thing - that is decentralization can be understood as the transfer of political decision making authority especially authority of spending and revenue functions to lower tiers of governments. However the measure used to construct decentralization does not really reflect this aspect in some of the measures stated in Table 2.1.

One reason for difference in results between the studies mentioned above may be differences in the decentralization measure used. High sub-national spending and revenue shares do not always mean high local autonomy. Hence if autonomy is the key growth-enhancing characteristic of decentralization, then many of the previous studies (De Mello, 2000; Falch & Fisher, 2012; Jin & Zou, 2002; Jin, 2009; Kalirajan & Otsuka, 2012) that did not consider this fact probably over-estimated the degree of effective decentralization. Some amount of local revenues/expenditures are often controlled by Central governments and hence the results of these empirical studies can be misleading. Decentralization in such cases turn out to be not more than mere delegation. Sub-national governments become mere spending agents of higher levels of government with not much decision making autonomy over utilization of public funds. By contrast, some studies have used a more restricted measure of decentralization that is constructed using the following components, local government spending minus conditional/discretionary transfers and local revenues over which sub-national governments have some measure of control over the tax rate, the tax base, or both (Akai & Sakata, 2002; Ebel & Yilmaz, 2004; Lindaman & Thurmaier, 2002; Meloche, Vaillacourt, & Yilmaz, 2004; Oommen, 2006). Akai & Sakata (2002) defined decentralization in terms of autonomy of expenditure and revenue functions of sub-national governments. To measure actual amount of decentralization, one must capture the degree of devolution or the level of authority of the lower-level government. Allocation of decision making authority is normally done through legal and constitutional arrangements between levels of government. However, it is not easy to quantify the devolution of authority. For example, expenditure by state governments may actually be funded by grants from higher-levels of government. Hence, the mere share of state expenditure in the total state budget may not reflect the actual level of authority allocated. In fact, when the grantor specifies how the funds need to be utilized,

then the grants should be credited to the grantor who has the actual decision making power (Oates, 1972). Unconditional grants on the other hand, must be credited to the level of government that spends the funds (Akai & Sakata, 2002). Similarly in terms of revenue decentralization as well, though shared taxes seem as state revenue, however, the state government has no power to decide either the revenue base or tax rate and hence such transfers should be attributed to the Central government (Gemmell, Kneller, & Sanz, 2013). Thus although the state governments in a country have a greater share of expenditures or tax revenues, a second country may be more decentralized than it because they have greater autonomy in revenue collection or spending decisions (Martinez-vazquez & McNab, 2003).

2.3 Advantages of Decentralization

Theoretically there is a basic rule for the decentralized provision of public goods and services to be Pareto-superior compared to centralized provision of public outputs. Three important conditions are required to implement decentralization by states; heterogeneity, externalities, and economies of scale. Welfare is maximised under decentralization when regions are heterogeneous in nature in terms of their preferences for public goods and services. When regions do not show evidence of inter-regional spill-overs of the benefits of their expenditure to other states nor cost saving from a uniform centralised provision of public goods and services, decentralization is considered beneficial. With spill-overs and no heterogeneity, a Central government providing a uniform level of public goods and services at the local level is more efficient. With spill-overs, decentralization leads to under provision of local public goods, as local decision makers do not take into account benefits of the provision of public goods accruing to other states (Oates, 1972). The issue of spill-overs is specially relevant to investment in certain areas, like highway transport and communication, public research and extension and controlling pollution or epidemics where the benefits

of such expenditure can impact the entire country or at least larger parts of the country rather than just a particular state. It is less significant when the public goods and services are more local in nature. This includes local roads, minor irrigation, village health clinics and sanitation.

In fact through centralized provision it is possible to exploit economies of scale better in the construction of overhead facilities, but these economies of scale are less important in local management and maintenance. For example in South Korea, the Centre undertook the construction of the canal irrigation system but maintenance was handed over to the local governments. Similarly, in terms of primary education, while the local government oversees the daily functioning of schools, the upper-tier government undertakes responsibility of designing the curricula and enforcing minimum quality standards due to economies of scale. Yet another instance is in public delivery of electricity, wherein generation and transmission is the responsibility of centralized power plants due to benefits of economies of scale in grids, while the distribution is handed over to local governments (Bardhan, 2002).

2.3.1 Decentralization Better Matches the Local Demands

It is often stated that one of the defining features of a federal setup is the ability of regional governments to make independent fiscal decisions (Boadway & Shah, 2007). Decentralized provision of public goods and infrastructures caters to varied demand conditions in different regions and matches their resource endowments better than Central provision. This is because local governments are considered to have better knowledge of the local conditions, needs and preferences of their residents. Even in terms of provision of quasi-public goods, like the identification of target groups of beneficiaries is simpler and implementation of policies more effective when undertaken by decentralized governmental units (Ostrom, Schroeder, & Wynne, 1993). The basic-needs approach to development states that if the local beneficiaries are given a

participatory role in the decisions, their attachment and commitment to the project will be greater, and they may be able to tap their pooled resources more effectively to fund the recurring costs of basic services (Lindaman & Thurmaier, 2002).

Experience with several community development projects around the world has shown that communities are able to undertake quality work similar to that undertaken by hired contractors but at a significantly lower cost (Binswanger et al., 2009). In fact, the effectiveness of government expenditure is increased when the spending activities are assigned to the level of government that is directly associated with the beneficiaries of these expenditures (RBI, 2006).

2.3.2 Increases Efficiency of the Public Sector

Fiscal decentralization is seen as a solution to reform the inefficient public sector by promoting competition amongst sub-national governments (Bahl & Linn, 1992; Bird & Wallich, 1992; Oates, 1993). Inter-jurisdictional competition leads sub-national governments to create a suitable environment in order to attract mobile production factors and thus promote investment and economic growth. They do so by using fiscal policy, among other instruments. Firms select their investment locations based on the highest expected returns which in turn depend to a great extent on public inputs. Thus sub-national governments are motivated to raise the productivity and quality of their public sectors.

Competition between sub-national governments can work in two ways. First, sub-national governments may increase expenditure on productive services that benefit the business sector rather than spending on consumption, residential or social services; secondly it may increase the efficiency of total public spending irrespective of whether it is for productive or welfare purposes (Blöchliger & Campos, 2011).

The Tiebout (1956) hypothesis states that inter-jurisdictional competition for mobile production factors guarantees that local governments provide citizens with their

preferred mix of taxation and public expenditure (Boadway & Shah, 2007). Thus sub-national government competition can lead to innovations and promote cost effective delivery of goods and services for example fiscal decentralization in the 1980s and early 1990s incentivised local governments in China to compete based on market liberalization and institutional innovation, which was essential in China's reforms (Huan & Chen, 2012). In fact it is stated that the more decentralised a country, the stronger the competitive forces could be and that the total government size in the economy is inversely related to the extent of tax decentralization that has been undertaken in the country (Brennan & Buchanan, 1980).

2.3.3 Increases Accountability of the Local Government

Another advantage of decentralization is that it is easier to hold authorities accountable (Falch & Fisher, 2012). Sub-national governments may be subject to greater scrutiny by the public since they are closer to them in a decentralized setup. Public scrutiny forces authorities to appoint competent staff and to undertake efficient expenditure. Decentralization can reduce moral hazard and agency problems and reduce the number of layers of bureaucracy (Boadway & Shah, 2007).

Although many advantages have been attributed to decentralization, the positive impact of fiscal decentralization depends on the existing institutional structure of the economy (Tanzi, 1987). For the potential benefits of decentralization to be realized in an economy it depends on certain important factors including the size of country, the level of privatization in the economy; capacity of local governments to raise revenue; transparency, local administrative and institutional capacity (Neyapti, 2010). In fact an efficient local administrative capacity is identified as a strong determinant of the positive effects of decentralization (Lindaman & Thurmaier, 2002).

2.4 Disadvantages of Decentralization

Although a number of benefits have been associated with fiscal decentralization, however there are some potential risks associated as well. Some economists have associated decentralization with slower growth as it leads to macroeconomic instability (Prud'homme, 1995). Decentralization will be destabilizing if it leads to increased corruption wherein local elites capture larger share of public resources at the cost of the poor (Dreze & Sen, 1996).

2.4.1 Fiscal Decentralization and Regional Inequalities

Decentralization without proper equalizing resources across sub-national governments can lead to an adverse outcomes. This is because regions differ in fiscal capacity and expenditure needs. Thus differences in net fiscal benefits give rise to efficiency and equity problems. Decentralization along with competition between sub-national governments may worsen the condition of poor regions that cannot compete for mobile factors with the richer regions, and so poor regions get poorer, while the rich regions get richer. This increases the disparities. Previous empirical studies indicate that the system of decentralized governance in China resulted in considerable horizontal fiscal inequalities and the equitable distribution of fiscal resources deteriorated (Lou, Li, & Xiang, 2002; World Bank, 2002).

Decentralization funded by a "common pool" of resources such as grants and revenue-sharing might have an adverse effect on fiscal balances. By separating the link between taxes and benefits, mere expenditure decentralization might turn the public sector's resources into a common pool that competing local governments will attempt to take advantage as per their requirements and extract greater resources from the Central government (Rodden, 2003). This happens because regional governments' fail to absorb the full costs of transfers on national taxpayers (Rodden, Eskelund, & Litvack, 2003).

Since citizens link state goods and services with relatively low tax burdens, they undervalue the costs to themselves of public goods provided by the state as a considerable part of the state expenditure is funded through transfers. The result is excess demand on state spending by its residents (Boadway & Shah, 2007). These adverse incentives mostly arise in federal setups with tax sharing arrangements or unrestricted fiscal equalization programs or when heavily indebted states can easily expect a bail-out (Goodspeed, 2002). When sub-national governments can attain funds from the Central government to deal with their financial difficulties, then fiscal consolidation becomes impossible (Schaltegger & Feld, 2009).

2.4.2 Problems of Agency and Monitoring

The presence of different levels of government in funding, legislating, and implementing the same policies and programs makes it tougher for voters to identify and punish wasteful and rent-seeking activities of local politicians. Moreover, the Centre has to face adverse selection difficulties, because local governments have incentives to inflate costs and distort information when reporting to the Centre to receive larger transfers (Rodden, 2003).

2.4.3 Coordination Failures

Effective and timely synchronization between the different levels of government is difficult in a decentralized setup (Marinkov, 2013). Without institutional transparency, inter-governmental units may face severe coordination failures (De Mello, 2000). Sub-national governments would spend inefficiently and excessively. In a federal system sub-national governments cater to different constituencies. This is one of the reasons for policy divergence across levels of government (Riker, 1987). For example state governments may continue to overspend to gain favour from their constituencies although the Central government continues to follow fiscal austerity. Policy divergence occurs because the public holds national and not sub-national, governments accountable

for macroeconomic performance, and international pressures tend to focus attention on national governments. Because states are not really held responsible for their nation's macroeconomic performance, state governments are subject to collective action problems (Rodden & Wibbels, 2002). The fiscal problems of Latin American countries, for example, have been ascribed largely to the profligacy of sub-national governments (Bagchi, 1998).

2.4.4 Macroeconomic Instability

In a decentralized economy sub-national governments can affect macroeconomic performance in three ways. Firstly, state fiscal policy can cause financial imbalance at the Centre by eroding the revenue of Central governments. Secondly, monetary policy of Central governments can give rise to inflationary pressures if the Centre finances state fiscal imbalances by printing more currency. Thirdly, Central government debt can increase if it continuously engages in bailing out debt of sub-national governments. On the other hand unitary governments where sub-national governments are considered as mere agents of Central governments no such problems arise (Rodden & Wibbels, 2002). In fact in a decentralized setup national priorities in public spending have many a times been side lined by public projects of local governments (Zhang & Zou, 1998). Decentralized decision-making can also hinder the attainment of national equity objectives for example equality of economic outcomes and opportunity and hence the Central government tries to achieve these objectives in a decentralized set-up through transfers to sub-national governments. However, some of the benefits of decentralization, such as accountability and diversity, may be compromised by using transfers (Boadway & Shah, 2007).

Local governments may also lack the capacity and the expertise available at national institutions. These challenges point out to the need for effective planning, design and training prior to implementation of decentralization (Sharma, 2006).

2.4.5 Tax Competition

Decentralized set up can result in wasteful tax competition amongst sub-national governments (Hindricks, Peralta, & Weber, 2008). Rao & Singh (1999) refer to tax competition as a “race to the bottom” in which competing state governments engage in aggressive tax breaks and concessions to attract mobile factors of production, specially capital. This could lead to under-provision of important local public goods. With the introduction of Goods and Service Tax with a single uniform rate throughout the country, tax competition will no longer be a problem for India. However in the 1990’s state tax revenue collection decreased due to increased competition among state governments because of lowering of their tax rates (FC, 2000).

The effect of decentralization on government size is influenced by the type of fiscal federalism that is undertaken. Decentralization that is funded by a common pool of resources is associated with faster growth in total government expenditure. However decentralization that is funded by own local taxation leads to slower growth in government size (Rodden, 2003).

Hence it is felt to avoid the adverse consequences of fiscal decentralization and promote its positive effects, decentralization should be accompanied by greater fiscal autonomy of the sub-national governments. The greater the fiscal independence of state governments, the higher is the possibility of achieving fiscal consolidation. When a sub-national jurisdiction has to finance its spending by own tax revenue, the local politicians will restrict from over-spending. This promotes fiscal competition amongst regional governments wherein they resort to use of improved quality of public goods and taxes as instruments to attract mobile production factors. The resulting fiscal competition provides for a check on government size and, and even on government debt (Brennan & Buchanan, 1980). Fiscal balance may be used as a strategy by state governments to compete with their successes in obtaining sound public finances in order to attract good

taxpayers and this in turn will encourage fiscal consolidation at the sub-national and consequently at the Central level.

Successful fiscal adjustment thus becomes more likely under competitive federalism (Schaltegger & Feld, 2009). Optimal efficiency in a decentralized system requires that lower-level governments absorb all the social benefits and costs of their policies and programs (Boadway & Shah, 2007). The decentralization system should incorporate rewards for prudence in debt and expenditure management and thus encourage sub-national governments to practice fiscal discipline. The enforcement of severe constraints on sub-national indebtedness and effective scrutiny of sub-national fiscal conditions are necessary prerequisites for successful implementation of fiscal decentralization. Some countries have undertaken measures to monitor sub-national spending. For example Colombia had introduced a "traffic-light" system that equates a sub-national government's debt to its repayment capacity. In the United States, many states had introduced a Fiscal Watch Program wherein local governments were brought under an emergency regime if they failed to payback loans in time or failed to pay employees within a predetermined time period. During emergency the state was required to form a Financial Planning and Supervisory Commission. This Commission was authorized to analyze the local government's tax, spending, and borrowing to guarantee proper accounting (Bagchi, 2003).

2.5 Summary of Findings of Previous Empirical Studies.

2.5.1 Fiscal Decentralization and Income

Most of the empirical studies have analysed the impact of decentralization at the state level. A study of 28 Chinese provinces for the period 1978 to 1992 found that a higher degree of fiscal decentralization of government spending was associated with lower provincial economic growth (Zhang & Zou, 1998). Another study of 29 Chinese provinces for a shorter time period (1987 – 1993) also revealed a negative association

between fiscal decentralization and provincial economic growth. The authors undertook the same study for 16 Indian major states from 1970 to 1994 and found that fiscal decentralization is positively related to state economic growth (Zhang & Zou, 2001). However, Jin (2009) undertook a panel data study on 29 states in India from 1980 - 2005 and found that decentralization had a negative and significant impact on economic growth when two stage least square and two-step generalized method of moments (GMM) models were used. Another study using a sample of 50 states of the United States between 1992 and 1996 for the first time found that fiscal decentralization contributes positively to economic growth in the US (Akai & Sakata, 2002). A province level study in China for the time period 1985-98 found that decentralization has led to higher growth rate but it has also widened regional disparities (Qiao et al., 2008). For a region primarily relying on agricultural revenues, growth in productive expenditure is slower than a region endowed with a large non-farm tax base. In contrast to the earlier studies on China. Justin & Zhiqiang (2000) looked at province-level panel data from 1970 to 1993 and found that fiscal decentralization contributed positively to the growth process in China. Another study undertaken for the U.S. economy for the time period 1948 to 1994, found that state and local governments' expenditure share had contributed to growth maximization and further decentralization in public spending may be harmful for growth (Xie, Zou, & Davoodi, 1999). This shows that fiscal decentralization beyond a certain ideal level can also have negative impact on economic growth. Jin & Zou (2005) used a panel dataset for 30 provinces in China to examine the relationship between fiscal decentralization and economic growth over two phases of fiscal decentralization (a) from 1979–1993 under the fiscal contract system and (b) from 1994–1999 under the tax assignment system. The authors found that divergence, rather than convergence, in revenue and expenditures assignments at the provincial level is associated with higher rates of growth. The results suggested that provincial economic

growth was negatively affected by expenditure decentralization and positively associated with revenue decentralization. That is, further revenue decentralization and expenditure centralization would promote growth. The negative association between expenditure decentralization and provincial real GDP growth rate challenges the conventional wisdom of fiscal decentralization. It is, however, in line with Zhang and Zou's (1998) result. According to the authors the negative effect of expenditure decentralization supports the argument that Central government was in a better position to undertake public investment with nation-wide externalities in the early stages of economic development. There were few studies that tried to assess of decentralization at the local level. A study in China which examined county level panel of 1860 observations from 1993 to 2000, found that the successful implementation of fiscal decentralization depends on the structural and institutional factors of the province in which it is implemented (Zhang, 2006). The authors found that the heterogeneous economic structure is an offsetting divergent force.

Kalirajan & Otsuka (2012) used a panel data analysis on 25 states to understand the impact of rural decentralization at the local level on agricultural share of GSDP for the time period 2000-01 to 2002-03. The authors found that rural decentralization has a significant positive impact on agricultural GSDP. There have also been studies across countries to understand the impact of different levels of decentralization on economic growth. An empirical study using a panel data set of 46 countries during 1970-89 found that fiscal decentralization negatively affects growth in developing countries, but no such relation was found among developed countries (Davoodi & Zou, 1998).

Hence most of the empirical studies show that the impact of fiscal decentralization differs from country to country as well as it may differ between different time periods for the same country depending on the extent of fiscal decentralization that has been undertaken. The empirical findings also reveal that the impact of decentralization on the

economy's growth depends on the economic structure and institutional factors prevalent at the time. According to the RBI (2006), the extent of decentralization should be undertaken in such a way that it matches the needs of that particular country keeping in mind its political, social and economic climate. Ultimately, however, each country requires a system that is designed to suit its specific needs.

2.5.2 Fiscal Decentralization and Fiscal Deficit

There are only a few papers that have studied the impact of fiscal decentralization on fiscal discipline. A study was undertaken using a panel of 25 emerging market economies from 1980 to 2001 to examine the effects of fiscal decentralization on the success of fiscal adjustments (Baldacci, et al., 2006). The study does not report any robust effect of fiscal decentralization that leads to fiscal consolidation. However it was felt that the variable used in the paper to capture the effects of fiscal federalism does not differentiate between the impact of fiscal competition between sub-national governments and the off-setting impact of grants and thus it was felt that the variable used by Baldacci et al. (2006) does not allow for testing on the effects of fiscal competition on fiscal consolidation (Feld, Baskaran, & Schnellenbach, 2007). In another study that used a panel of 26 Swiss cantons from 1981 to 2001 it was found that fiscal centralization decreases the possibility of successful budget consolidations. Central government institutions encourage the discretionary use of public funds and thus hamper long-lasting fiscal adjustments. In addition, the authors present empirical evidence that an increase in federal transfers significantly reduces fiscal discipline. On the other hand, fiscal competition in a federation strengthens fiscal discipline thereby strengthening fiscal stabilization (Schaltegger & Feld, 2009). In one instance a measure of Vertical Fiscal Imbalance (VFI) was used to find out the relationship between overall fiscal performance and the financing structure of sub-national governments using data from 28 OECD countries for the time period 1995-2007. On average, the general

government fiscal balance is found to improve by one percent of GDP for each 10 percentage point reduction in VFI (Eyraud & Lusinyan, 2013).

A panel data study of 30 OECD and Non-OECD countries showed that sub-national tax autonomy was found to worsen fiscal imbalances at the sub-national level for the entire sample as well as for the sub-samples. This according to the authors could be the result of coordination failures due to moral hazard in a decentralized setup. Evidence of coordination failures due to sub-national fiscal dependency on federal transfers was found in the Non-OECD sample, in which reliance on inter-governmental transfers was found to worsen Central government fiscal balance. The converse was nevertheless found in the full sample and in the OECD sample. According to the authors, in the OECD sample, the dependency of sub-national governments on Central transfers would tend to improve fiscal positions, as long as sub-national spending was not too large relative to that of the Central government. Sub-national expenditure share which was used as a proxy of fiscal decentralization was also found to lead to higher fiscal deficit both for the full sample and Non-OECD countries (De Mello, 2000). Using a panel data of 30 countries from industrial and developing countries for the time period 1980-1994 the authors found that expenditure decentralization leads to smaller national governments, larger sub-national governments, but on the whole it leads to larger aggregate governments. On the other hand revenue decentralization increases sub-national governments by less than it reduces national governments, hence leads to smaller aggregate governments. The authors argue that revenue decentralization is better than expenditure decentralization in promoting fiscal consolidation at the sub-national level (Jin & Zou, 2002). Bhatt & Scaramozzino (2013) using a panel dataset examined the relationship between federal transfers and fiscal deficits in India from 1990 to 2010 and they found that there exists bi-directional causality between Finance Commission transfers and fiscal deficit.

2.5.3 Fiscal Decentralization and Outcomes

Faguet (2004) through empirical tests found that decentralization in Bolivia increased the responsiveness of public investment by local governments to local demands. His tests revealed that investment in human capital and social services, such as education, water supply and sanitation, improved significantly after decentralization. In another study a country panel data set was used to understand the impact of public sector decentralization on international student test scores for the time period 1980–2000. The regression results suggested that expenditure decentralization enhances student performance. This was meant to demonstrate the linkage between government decentralization and the quality of public sector services (Falch & Fisher, 2012). Galiani & Schargrotsky (2002) show that the decision to decentralize public education in the early 1990s raised student achievement in Argentina, while Naper (2010) reports that decentralized hiring of teachers increases school effectiveness in Norway. On the other hand, Merrouche (2007) finds that decentralization of education expenditure in Spain did not affect the illiteracy rate.

Decentralization has been advocated by health care reformists as an influential means of improving the provision of health services. Advocators of fiscal decentralization argued that devolving power to local governments would improve health outcomes by bringing authorities closer to the people and by enhancing the participation of the community in the decision making and implementation processes (Arun & Ribot, 1999; Besley & Burgess, 2001; Mill, 1994; Peabody et al., 1999; Robalin, Picazo, & Voetberg, 2001). Various studies conducted by the World Bank have also suggested that public goods and services including health care should be provided by the lowest level of government in such a way that they can fully bear the costs and reap the benefits (World Bank, 1997, 2004). In fact centralization has been considered to be unsuitable with the objective of providing primary health care services (Collin & Green, 1994). A panel

data study undertaken on provinces in Argentina from 1970 to 1994, revealed that Infant Mortality Rates (IMR) decreased with increased fiscal decentralisation. In addition, this study also found that disparities in regional IMR declined considerably over the period after decentralization reforms were initiated (Habibi et al., 2003). In yet another study the authors tried to understand the influence of decentralization on IMR for 14 major general category states in rural India for the time period 1990-1997. The results show that rural IMR reduced due to the influence of fiscal decentralization. Besides, the extent of political decentralization in rural India was also found to enhance the effects of rural decentralization (Asfaw et al., 2007).

Cantarero & Pascual (2008) and Jiménez-Rubio (2010) found that fiscal decentralization was inversely related to IMR in the Spanish regions and Canadian provinces, respectively. However the major limitation of the study by Cantarero & Pascual (2008) was that they used a measure related to fiscal decentralization on health, such as the ratio of sub-national health expenditure to the total, instead of overall public-sector indicators. IMR besides health and medical services are also affected by education and other related factors and hence its share in public expenditure would be a better measure. Another study to assess the effect of health expenditure decentralization on IMR in Colombia for 1080 municipalities from 1998-2007 found that IMR decreased due to fiscal decentralization. But the decrease in IMR was also attributed to the socio-economic status of the municipalities as the effect was greater in non-poor municipalities. In this study health resources were lagged by three years to deal with possible endogeneity problems in the model estimation. Endogeneity may arise from a reverse causality problem since not only can the level of health expenditures have an effect on infant deaths, but municipal governments may spend on health sector depending on the level of IMR (Soto, Farfan, & Lorant, 2012). In a cross country study for different years including 1985, 1990 and 1995 a significant relationship was found

between greater fiscal decentralization and better performance on measures of basic needs such as health and education. And it was found that fiscal decentralization in terms of own-source revenue had the strongest positive effects on basic needs (Lindaman & Thurmaier, 2002).

2.6 Vertical and Horizontal Fiscal Imbalances and Inter-governmental Transfers

In a decentralized setup lower-level governments often have insufficient revenue capacity to meet all their expenditure needs and fiscal decentralization can increase these fiscal disparities leading to horizontal and vertical fiscal gaps (Falch & Fisher, 2012). Such fiscal and cost disparities occur due to an unequal endowment of natural resources, factors of production, varied topography, demographic distribution of population, climatic and socio-economic conditions that affect costs of providing public goods and services across regions. Equalization can be seen as a natural complement to decentralization as it aims at correcting these fiscal imbalances.

Federal governments use inter-governmental transfers also referred to as equalizing transfers to close the fiscal gap (Boadway & Shah, 2007). The importance of fiscal equalization is seen not only by its extensive use in federal and unitary nations, but also by the fact that its objectives and principles are upheld by Constitutional provisions. Fiscal equalization varies from country to country and depends on the wider institutional framework such as size, number and geographical distribution of sub-central governments, the resources and the autonomy allocated to sub-national governments as well as the expenditure responsibilities devolved to them. In fact, while some countries resort to distinct equalization transfers, others do not even refer to the word “equalization” although most nations have some embedded instruments to decrease inter-governmental fiscal inequalities. Although equalization is a concept with many different interpretations, fiscal equalization simply means transfer of resources

across sub-national jurisdictions in order to reduce differences in their revenue raising capacity or cost of provision of public services (Bird & Smart, 2002).

In Canada, the intent of equalization has been stated in the constitution wherein equalisation transfers are meant to guarantee that provinces have adequate finances to supply reasonably comparable levels of goods and services at reasonably comparable levels of taxation. According to Canadian legal institution, equalization is a result of the rule of equality of all citizens before the law. Unlike Canada, Australia does not have any formal equalization requisite mentioned in its Constitution. However section 96 of the Australian Constitution enables the federal government to render financial assistance to any state based on the terms and conditions as determined by the Parliament (Boadway & Shah, 2007). Section 96 of the Australian Constitution was meant to assist states that suffered due to lack of fiscal capacity. The equalization of objectives of the Australian federal government was clearly stated in the terms of reference of the Australian Commonwealth Grants Commission, 2005. It stated that the funding of state governments should be guided by the principle that if each state made the same effort to raise its own revenue and functioned at the same level of efficiency, each would have the capacity to provide services at the same standard (Boadway & Shah, 2007). The German equalization system is given a constitutional justification based on the rule that citizens should not be given different treatment by the government just because they reside in different parts of the country. The goal of fiscal equalization in Switzerland is to make available minimum acceptable levels of certain public services with more or less equal tax burden in all cantons (Boadway & Shah, 2007).

2.6.1 Measures of Horizontal and Vertical Fiscal Equalization

Vertical deficiency refers to the mismatch between comparative responsibilities and available resources of different levels of government. In other words, vertical imbalance results from the disparity between the cost requirements and the revenue raising ability

between the Central and state governments. In India for example the Constitutional scheme of transfers was planned in such a way that a vertical imbalance was embedded into the assignment of resources and responsibilities for the two tiers of government. While the Centre was assigned comparatively larger resources, the states were given the greater responsibilities of service provision. Economies of scale in tax collection by the Centre provides an efficiency argument for assigning greater taxation powers to the Central government (Boadway & Shah, 2007). These are the traditional efficiency and equity arguments that support asymmetry in expenditure and revenue-raising responsibilities between different levels of governments that gives rise to vertical fiscal imbalances. Vertical imbalances can also arise when sub-national governments resort to beggar thy-neighbour tax policies that is they undertake wasteful tax competition by reducing the tax rates in order to attract business and trade. Another reason for vertical imbalances is when the Centre and state governments share the same tax base and there is little tax room left at state levels due to heavier tax burdens imposed by the Central government (Boadway & Shah, 2007). In order to measure the Vertical imbalances empirical studies have used different measures as listed in Table 2.2.

Table 2.2: Measures of Vertical Fiscal Imbalances used in Literature		
No	Author	Measures of Vertical Fiscal Imbalances (VFI)
1	Ahmad (1997)	$= \frac{\text{Subnational resources not under subnational control}}{\text{Total subnational expenditures}}$
2	Collins(2002); Ebel & Yilmaz(2002)	$= \frac{\text{Own source revenue}}{\text{Own purpose expenditures}}$
3	Hunter (1997)	$\frac{\text{Net intergovernmental grants (SNG *)}}{\text{Expenditure + Lending (SNG *)}}$
4	Rodden & Wibbels (2002)	$\frac{\text{Grants + revenues sharing}}{\text{Total revenue (SNG)}}$
5	Jin & Zou (2002)	Percentage of expenditures at the sub-national level financed by Central transfers
6	Eyraud & Lusinyan (2013)	VFI = Transfer dependency + SNG deficit SNG deficit = $\frac{\text{SNG net borrowing}}{\text{SNG own spending}}$ Transfer dependency = $\frac{\text{SNG net transfers}}{\text{SNG own spending}}$
7	Eyraud & Lusinyan (2013)	$VFI = 1 - \frac{\text{revenue decentralization}}{\text{spending decentralization}} (\text{GG deficit})$ Revenue decentralization = $\frac{\text{SNG own-revenue}}{\text{General Government revenue}}$ Spending Decentralization = $\frac{\text{SNG own-spending}}{\text{General Government spending}}$ **GG deficit = $\frac{\text{General Government spending} - \text{General Government revenue}}{\text{General Government spending}}$
8	Rangarajan & Srivastava (2004)	1) $VFI = \frac{(\text{Expenditure} - \text{own revenue})}{\text{Expenditure}}$ 2) $VFI = \frac{(\text{Expenditure} - \text{own revenue} + \text{transfers})}{\text{Expenditure}}$
9	Srivastava & Rao (2009)	In order to measure VFI one must measure per capita transfers given to the average state. Deviation of transfers in per capita terms from this average can then be seen as a redistribution of these transfers from the richer to the poorer states.
10	(Srivastava & Rao (2009)	Alternate Measure: vertical transfers can be measured as transfers given to the highest per capita fiscal capacity state and an equal amount given to all states. Compared to this amount, for the states that have larger per capita transfers, the difference between this vertical component and the total per capita transfer to the state is taken as the horizontal component of transfer
Note *SNG= Sub-National Government **GG= General Government		

Vertical transfers are given to all states regardless of their individual fiscal capacities.

Most of the measures of VFI stated in Table 2.2 contain horizontal imbalances as well

in the VFI measure. Bird & Smart (2002) on the other hand argued that VFI is attained when expenditures and revenues inclusive of transfers are balanced for the richest local government. Fiscal gaps will still be there for poorer sub-national governments, but such gaps should be regarded as horizontal fiscal imbalances between sub-national governments rather than vertical imbalances between levels of government. This definition is also the one used by Srivastava & Rao (2009). However Bird & Tarasov (2002) accept that the two concepts of fiscal imbalances i.e. vertical fiscal imbalance and horizontal fiscal imbalance cannot be cleanly separated.

According to Boadway & Shah (2007), to reduce the vertical fiscal gap, it is necessary to deal with its causes through a mix of policies. It may require a re-devolution of responsibilities between Centre and states which may need Constitutional amendments in certain cases. This includes greater tax decentralization or tax options to the Centre wherein it does not levy a particular tax in order to provide greater tax options to states. Another way is tax-base sharing wherein sub-national governments are allowed to levy supplementary rates on a national tax base. Many economists feel that unconditional formula-based transfers reduce accountability to local taxpayers and should be considered only as a last resort. Taxation by tax sharing, as seen in countries like China and India, have adverse effects, as it induces donors to put in less effort in collecting taxes that are shared than they would have if these taxes were fully retained by the donor. This trend has been seen in India wherein the amount collected under income tax and Union excise duties both of which are shared with the states declined whereas revenue collected through cesses, surcharges etc. which are retained entirely by the Union increased (FC, 2009). In many of the industrial countries the fiscal gap is normally addressed with tax decentralization or tax-base sharing programs. Canada and the Nordic countries have put into operation coordinated personal and corporate income tax systems wherein the Central government provides tax abatement and sub-national

governments impose supplementary rates on the national tax base (Boadway & Shah, 2007).

2.6.2 Measurement of Horizontal Fiscal Imbalances

Horizontal imbalances refer to the differential fiscal capacities of the states, relative to their needs in respect of their assigned responsibilities. Horizontal fiscal imbalances can arise due to revenue or expenditure differences amongst states. Revenue disparities across states can be due to either differences in fiscal capacity due to resource endowments or due to differences in tax effort which includes populist tax concessions or it could also be the result of an incompetent tax administration. Similarly, there are expenditures which need to be undertaken to improve development indicators which differs across states or expenditures that are a consequence of higher cost of providing goods and services due to factors beyond the control of states. But some are unproductive and wasteful expenditures, merely driven by political motives (fiscal populism). Some differences between state expenditures can be due to differences in the standard of delivery of public services (Mukhopadhyay & Das, 2003).

Cross-country research suggests that inter-country fiscal differences may also be attributed to large variations in the levels of economic development and economic structure; these findings can be applied to disparities between regions within a country as well (Tanzi, 1987). Local governments that comprise of a primarily agricultural based economy are more revenue deficient than those with large non-agricultural sectors getting revenues mainly from business tax and value-added tax. According to Yu & Tsui (2005) the evolution of institutions and policies peculiar to China may be the cause of the spatial distribution of fiscal resources. They adopted a regression-based approach used by Morduch & Sicular (2002) to decompose fiscal disparity with respect to per capita fiscal expenditure in China. The empirical results showed that GDP per capita and urban–rural dichotomies are the two most important variables that affect

fiscal disparities. Other relatively important factors were economic structure and population.

Inter-governmental transfers can be designed in various ways, and its effect, therefore, depends crucially on a particular design. Hence a crucial prerequisite for designing an efficient transfer mechanism is the identification of the determinants of horizontal imbalances (Mukhopadhyay & Das, 2003). For example, very little revenue efforts by states could be an important cause for horizontal imbalances. Since it is an endogenous factor, an unconditional grant can create a moral hazard problem and hence in such a case Central transfers should not be unconditional. However an unconditional grant may be desirable when there are exogenous parameters, for example higher cost of providing public utilities due to geographical location or higher share of dependent population. Therefore, faulty design of devolution and resultant moral hazard problem could also explain persistence of horizontal imbalances. According to Mukhopadhyay & Das (2003), horizontal inequalities in India are a result of a variety of economic as well political influences. The major causes of horizontal disparities in India have been attributed to differences in revenue base, tax effort, infrastructure and political instability. Although Central transfers help to reduce horizontal imbalances however, in the long run they cannot solve the problem. In order to measure the horizontal imbalances empirical studies have used different measures as listed in Table 2.3.

Table 2.3: Measures used to Compute Horizontal Fiscal Imbalances		
	Authors	Measures used in Literature
1	Ahmad, Singh, & Fortuna (2004)	Maximum–minimum ratio on per capita local revenue or expenditure
2	An & Ren(2007); Knight & Li (1999); Zhao (2009)	Gini index and Coefficient of Variation
3	Yu & Tsui (2005)	Theil’s Entropy, and Coefficient of Variation of per capita expenditures in constant and current prices
4	Huan & Chen (2012)	Population-weighted Theil index and population-weighted coefficient of variation. ¹
5	Zhang (2006)	Gini coefficient of per capita income, per capita productive public expenditure, and the share of productive investment in total public expenditure
6	Mukhopadhyay & Das (2003)	Coefficient of variation in own revenue as a percentage of total expenditure
7	Huan & Chen (2012)	Shorrocks's factor decomposition to disaggregate the role of different revenue components in determining overall fiscal disparities.

Jin (2009) adopted the definition of Qiao et al.(2008) to compute an index of horizontal equalization. The author calculates the difference between a province’s per capita expenditures and the mean of provincial expenditures. This is calculated for every province and year covered in the study. The author switches these differences into ‘distances from the mean per capita provincial expenditures, by taking their absolute values. These values are normalized by dividing each of them by that year’s mean per

¹Although population-weighted coefficient is more sensitive to change than is Theil, both measurements generally show similar trends.

capita provincial expenditures. Lastly a negative sign is added to these figures in order to give the index a more discerning interpretation. As this indicator moves towards zero from the left, the province's per capita expenditures move closer to the mean of per capita provincial expenditures and thus indicates greater equality.

According to Bagchi (1998) Centre's transfers lead to horizontal equities if it helps to decrease the differences in the revenue surpluses (or deficits) of the sub-national governments on a normative approximation of their revenue capacity and costs of providing public services at a reasonable standard. In order to find out the equalizing effect of Central transfers Bagchi (1998) compared the co-efficient of variation in the tax devolution per capita with that of per capita State Domestic Product for India.

2.6.3 Main Reasons for Equalization

Inter-governmental grants are key instruments used by Central governments to equalize fiscal capacities across regions in order to minimize disparities in the provision of basic services, such as health and education (Lindaman & Thurmaier, 2002). Grants can be viewed as instruments for enabling the achievement of the advantages of decentralization while at the same time enabling the achievement of national objectives (Boadway & Shah, 2007). The benefits of fiscal equalization can be stated as follows:

1. Equity: In all countries, the main objective of equalization is equity (Blochliger et al., 2007).
 - a) To equalise revenue raising capacity
 - b) To stimulate efficiency by equalising the per capita cost of provision of public goods and services across regions. This would help to equalise the marginal benefit of public spending across regions and achieve national standards in social programmes (Rangarajan & Srivastava, 2008).
2. Externalities: To reduce negative fiscal externalities that can lead to misallocation of labour and capital across regions. A decentralised setup wherein states have different

revenue raising capacities could adversely impact the location decision of mobile factors of production. Inequality in tax bases result in the concentration of capital and labour in high tax base states (or with low tax rates) and hence distorting location decisions of mobile factors of production. Grants that equalize tax bases across regions will help minimize such inefficient allocation. Thus equalization helps to prevent inefficient migration and over-crowding of developed states.

Courchene (1984, 1998) had stated that the efficiency argument of equalisation was based mainly on the existence of fiscally stimulated migration. If such migration does not exist, then there is no need for equalization based on efficiency criterion. However, Dahlby & Wilson (1994) argued in favour of efficiency criterion of equalisation even when there is no fiscally induced migration. The authors analysed the role of equalisation grants as an instrument for optimizing social welfare function or minimising the excess burden of taxation. According to the optimal tax theory the social cost of revenue collection depends not only on the extent of the tax base but also on the responsiveness of the tax base to changes in the tax rate. The authors argue that it is imperative to refer to "responsiveness" rather than just the tax rate. The greater responsiveness to changes in the tax rate, the greater is the marginal cost of public finances. Based on this argument, the authors show that differences in fiscal capacities, even without fiscally induced migration, is a sufficient reason to implement equalisation (Rangarajan & Srivastava, 2008).

3. Insurance: Besides the traditional role of promoting equity while distributing tax revenues among states, equalization transfers can also be regarded as an insurance system against region-specific shocks to their fiscal sources (Boadway, 2004; Boadway & Shah, 2007; Lockwood, 1999). In all federations, different combination of federal budgetary systems, have strong shock-absorber effects in order to reduce the degree of economic distress or of sudden rise in prosperity of individual states. This is

both the product of and the source of the sense of national camaraderie, which all important economic and monetary unions experience (Boadway & Shah, 2007). This holds true too for sub-national governments within a country as well. These equalizing grants help to provide insurance against asymmetric income or employment shocks. If the regions of a country experience asymmetric shocks, redistributive grants may serve as an insurance against the adverse effects of such shocks on income or employment (Boadway & Shah, 2007).

Barro & Sala-i-Martin (1995) argue in favour of equalizing transfers. The authors state that regional convergence in per capita incomes occurs due to the presence of diminishing marginal returns. In such a case the rate of return on a marginal increase in expenditures on infrastructure or social services are greater in low income states as compared to high income states due to diminishing marginal benefits. Hence transferring of fiscal resources by Central government from high income to low income regions will lead to a higher national growth rate. Similarly, if equalizing transfers provide a social safety mechanism for the poorer states and thereby decrease the possibility of social unrest arising from inter-regional fiscal disparities, then horizontal fiscal equalization would have a positive effect on the aggregate national growth rate.

However if the transfer system itself is distortionary, then there may be a trade-off between horizontal fiscal equalization and growth. This is because there is also the risk that low income regions may not utilize finances as efficiently as high income regions, either due to differences in the quality of administration or the availability of trained staff. In such a situation, shifting resources from well off regions to poorer regions can slowdown the overall rate of growth. This is because a high degree of equalization would mean taking resources away from faster growing regions (Jin, 2009).

Fiscal equalization being a redistributive scheme is controversial because different states have very different preferences in this respect. Jurisdictions with higher tax

revenue and lower cost of public services are likely to be opposed to transfers that lead to subsidization of governments with low tax revenue and high public service cost. Such opposition to transfers is strengthened if horizontal fiscal equalization is viewed as a mere gap-filling mechanism wherein sufficient transfers are required to equalize actual revenues and actual expenditures of the sub-national governments.

Such an approach which was followed by the earlier Finance Commissions in India and was given the name of “fiscal dentistry,” by Rao & Chelliah (1991), is detrimental for the fiscal health of the economy. Equalizing the actual outlays of local governments in per capita terms to the level of the richest local government in effect ignores differences in local preferences and hence one of the main reasons for decentralization. It also ignores local differences in needs, in costs, and in own revenue-raising capacity. This goes against the very goal of equalization. Equalizing actual outlays instead of equalizing based on revenue raising capacity and cost disabilities would hamper both local revenue raising effort and local expenditure restraint. Under this system those with the highest expenditures and the lowest taxes receive the largest transfers (Bird & Smart, 2002).

In fact some of the characteristics of a country’s fiscal system that worsens fiscal imbalances are unrestricted transfers, equalization programs, and overlapping functions of the Central and sub-national governments (Boadway & Shah, 2007). A high degree of equalization can have an adverse effect on the development of tax bases and tax effort. A transfer from Centre reduces the “price” the sub-national governments have to pay for any expenditure in terms of the own taxes they will have to raise. Thus depending on the incentives it creates, transfers can either crowd out own revenue raising, or make it more attractive for sub-national governments to complement the transfers. For example, transfers in the education sector may crowd out own revenue raising for local schools. Similarly, unrestricted block grants may stimulate local

authorities to exert more effort to complement the transfers, as the public expenditure can now match the preferences of the village community better (Binswanger, Nagarajan, & Pradhan, 2012).

Free-riding by poorer jurisdictions also stimulates overspending given that each sub-national government has an advantage to inflate its budget as it may lose its share from the divisible pool to competing governments. In some cases, fiscal equalization can open a development trap for poorer jurisdictions and even increase long term disparities. Another important drawback is that the distribution of inter-governmental transfers is not necessarily driven by normative considerations. Very often political forces have a significant influence in determining these transfers (Biswas & Marjit, 2014). International empirical studies suggest that national politicians make decisions of allocating resources across regions with an aim to maximize their electoral goals, over and above the normative objectives of equity and efficiency. Hence decisions at the Centre regarding regional distribution of resources is also a result of the political economy wherein national politicians are elected from regional constituencies, and political bargaining within the legislature determines distribution of transfers (Baron & Ferejohn, 1989; Becker, 1983; Weingast, 1979; Weingast, Shepsle, & Johnsen, 1981).

2.7 Criteria for an Effective Transfer System

The question about what determines the appropriate amount of transfers to governments and the criteria and weights to be attached for the purpose of devolution is a highly debated topic. Many governments adhere to the principles of equity and fairness while trying to determine the appropriate level of transfers. While determining the structure of transfer programs, it is imperative that governments and planners focus special attention to the incentives (positive or negative) that they create for different levels of government. In fact the outcome of transfers to a great degree depends upon the type of incentives (whether intended or not) that are embedded into transfer systems. Ultimately

what matters is whether the inter-governmental transfers lead to a reduction in fiscal disparities or not.

The objective should therefore be to design a transfer scheme that provides regional governments with sufficient revenues and the correct incentives to promote efficient and equitable spending, taxation and borrowing. The challenge is to design inter-governmental transfer systems that reduce the incentives for fiscally reckless behaviour by lower level governments and to avoid situations in which the Central government has to supply additional funds to sub-national governments that exceed their budget constraints (Boadway & Shah, 2007).

The literature suggests certain criteria for an effective transfer and assignment system (Boadway & Shah, 2007; Rao, 2000):

- 1) The allocation of functions and sources of finance between different levels of government should be based on the principle comparative advantage
- 2) The transfers to the sub-national governments should empower them with adequate finances in order to undertake the necessary and assigned responsibilities. The revenue powers should more or less be on par with the assignment of expenditure functions.
- 3) The transfers should induce states to increase their tax effort and raise greater revenue from their respective tax bases. At the same time the transfers should also have systems in place that encourage sub-national governments to resort to expenditure restraint and keep their fiscal deficits low.
- 4) The allocation of transfers to the lower levels of governments should be based on the principle of equity. Greater transfers should be allocated to governments with greater expenditure responsibilities and fewer transfers to governments with greater fiscal capacity.

- 5) In order to generate the intended outcomes, transfers should be transparent and also incorporate stability. The formulae which determine devolution of transfers should be announced in advance and each state should be able to foresee its total revenue inclusive of transfers in order to plan their budget. Further the mechanism should be stable for at least 3-5 years, to allow some certainty in the flow of finances for the state governments to engage in medium to long term planning.
- 6) A proper mechanism should be put in place to deal with the overlapping of expenditure and taxation systems of the Central and state governments.

Ultimately, circumstances and objectives differ across countries and hence no simple, single pattern of transfers is universally appropriate. However worldwide experience regarding the inter-governmental transfer systems makes it clear that if goods and services are to be efficiently provided, transfers must be planned in such a way that the recipient governments have a clear mandate, adequate finances, adequate flexibility to make decisions and most importantly are accountable for the outcomes (Bird & Smart, 2002).

2.7.1 Types of Inter-governmental Transfers

Inter-governmental transfers can be broadly classified into conditional and unconditional grants.

Conditional grants which are also called as specific purpose grants or categorical grants are transfers whose purpose is clearly stated by the donor. Conditional grants are usually resorted to when the Centre wants to spend in areas that it considers as relevant but is not considered as relevant by the states. Expenditure which include considerable externalities can be considered as examples of such expenditures (RBI, 2006). In the USA a sizeable amount of the transfers comprise of conditional grants as opposed to other developed countries. Conditional grants are found to suit the federal structure

better than unconditional grants, because the major inter-state disparities are not in tax capacity but in service provision. Further, the US federal government wants to focus on a particular service rather than a universal level of service (Ma, 1997). Examples of conditional grants in India are Centrally Sponsored schemes.

Conditional grants can be further sub-categorized into the following types (Bird & Smart, 2002; Boadway & Shah, 2007):

1. Open-ended matching grants: The Centre provides matching amounts for every rupee contributed by the recipient. This grant is termed as an open-ended matching grant since the final expense to the donor ultimately depends on how much the recipient contributes.

2. Closed-ended matching grants: For such type of grants, the Central government, may specify a maximum sum up to which it will contribute in order to limit the extent of expenditures undertaken by it. Due to concerns of proper fiscal management, such grants are common amongst countries.

3. Non-matching Grants: For such grants, amount provided by the Central government is fixed with the criteria that it can be only used for a pre-determined cause. Here the recipient may not be required to contribute some matching amount.

Unconditional grants on the other hand have no pre-specified criteria which ties the recipient with regard to its use and is a lump sum quantity that is received by the states from the Centre. Unconditional grants are meant to provide autonomy to the states in spending these funds for local priorities. Such grants are common in countries wherein regions are heterogeneous in nature in terms of their language culture, geographical distribution, level of economic development and thus have very locally generated needs that can be addressed more efficiently by the sub-national governments. In some countries, unconditional equalization is undertaken in the form of a general revenue-sharing system wherein transparent formulae are used to allocate the transfers to sub-

national government. In India for example transfers by the Finance Commission take the form of sharing tax between the Central and state governments. According to Bagchi (2003) grants from the Centre meant purely for "equalization" should be unconditional in nature, except that the states should compulsorily maintain necessary accounts. Typically though, conditionalities normally tend to be added and go against the spirit of the Constitution. Specific-purpose grants should be few and designed only to see that they are spent for their designated purposes. These grants could be used for two purposes: (1) to help states with clearly lower levels of public service in such areas such as health and education and (2) to deal with externalities.

2.7.2 Standardized Formulae for Equalization Transfers

In order to have a normative approach while disbursing transfers many countries try to use measures that reflect fiscal capacity and expenditure needs rather than just focusing on actual revenues raised or actual expenditure incurred by sub-national governments. We discuss below some of the commonly used formulae by countries to devolve funds to sub-national governments.

The formula discussed in this section incorporates not only the differing spending needs but also takes into account the varying revenue capacities of different localities. Australia, Japan, Korea, and the United Kingdom have used such formulae in order to determine transfers to their sub-national governments (Ma, 1997). A major drawback is that these formulae require exhaustive data. A representative formula of this type is stated below:

$$TF_i = N_i - C_i - OT_i \quad (2.1)$$

where N_i is the expenditure need of the i^{th} state, and C_i is the revenue capacity of the i^{th} state. TF stands for Central transfers and $N_i - C_i$ is the gap between the fiscal need and fiscal capacity of state "i". Here fiscal capacity refers to the own revenue capacity of state "i". OT_i symbolizes other transfers that the i^{th} state receives from the Centre. This

formula basically follows the rule that states should have the capacity to supply services at a similar standard with same revenue effort and same functional efficiency (Sharma, 2006)

There is a second type of devolution scheme that aims at solely equalizing fiscal capacities and is used in Canada. This equalization program is structured to decrease differences in revenue-raising capacity across provinces, where in the province's transfers are based on its actual tax bases (Boadway & Hayashi, 2004). This scheme is not as data intensive as the first formula and thus is easier to implement. This is known as representative tax system and is stated below:

$$TF_i = Pop_i (BS/Pop - BS_i/Pop_i)e \quad (2.2)$$

where BS_i refers to the tax base of state i , BS refers to the entire national tax base, Pop_i refers to population of state i , Pop refers to the entire nation's population, and the Nations' mean effective tax rate as a ratio of the tax base is represented by "e". The difference between country's mean tax base per capita and state i 's tax base per capita is captured by $(BS/Pop - BS_i/Pop_i)$. Sometimes this formula is slightly altered to allow use of a different tax base as a standard for comparison. For example, the country's mean (BS/Pop) could be substituted by the mean of fewer selected states. These selected states are used to control the strength of the equalization program by the Centre. If the states selected result in a group mean that is below the country's average, then fewer transfers are required to be disbursed as a part of the equalization program. Such equalization programs make strong assumptions that the states have equal expenditure needs in per capita terms. This assumption is considered to be unrealistic and it may lead to other types of inequalities amongst states. However, if states in a country have more or less similar cost differentials or if requisite data is not available then this formula may be an appropriate option.

The third type of equalization formula considers certain need factors. This formula does not consider revenue capacity of regions. Examples of countries that use this formula in determining transfers across sub-national governments include India, Italy, and Spain. Detailed explanation of the formula used by India is given later (chapter seven) in this thesis. A state's fiscal needs can be captured by a variety of indicators however the indicators that are selected are based on the government's objectives and at the same time are based on the prevalent political and historical influences (Ma, 1997). Some common indicators along with appropriate weights that are used by countries are stated below:

Level of per capita income, level of poverty, unemployment rate, population density, area, health indicators like IMR, life expectancy, school enrolment rate, infrastructure etc.

The fourth type of formula which is the simplest to be executed is the one that distributes equalization transfers based on an equal per capita basis. In comparison to the other transfers mentioned above, this transfer is least challenging in terms of data requirement however it also suffers from having the weakest equalization capacity.

The formula is as follows:

$$TF_i = Pop_i (TS/Pop) \quad (2.3)$$

where,

TS stands for total transfers disbursed, Pop_i stands for the population of state i and Pop stands for the total population that qualifies for the particular transfer program. Equal per capita transfers are not fully equalizing in their effects however they can reduce inter-state differences.

The first mechanism has the greatest potential for achieving full equalization. Even though it estimates horizontal fiscal gaps most accurately as compared to the other

three, it is the most difficult to implement as it is data intensive and needs to be carefully undertaken.

The second and third formulae ignore a major aspect (capacity or need) necessary for optimal horizontal equalization, and thus have a lower impact in narrowing disparities amongst the states. However, they require less data as compared to the first formula and thus may be useful for developing countries that do not have adequate data. The last formula is the least effective in terms of equalization, but is also least demanding for data and therefore easy to use (Ma, 1997).

2.8 Summary of Empirical Findings of Previous Studies

2.8.1 Fiscal Equalizing Impact of Inter-governmental Transfers

We now look at some cases where inter-governmental transfers have helped to reduce disparities across sub-national governments in different parts of the world.

A study by Zhang (2006) in China made use of a county level panel data set comprising of 1860 observations for 1993 and 2000 in order to investigate the distributional impact of decentralization. The findings revealed that nationally designated poor counties in China were growing slower than other counties. This is consistent with the findings by Fan, Zhang, & Zhang (2004) on the performance of China's poverty alleviation program. An explanation provided for this is that local governments in the poor countries may be more likely to understate their performance indicators in order to maintain their poverty status and thus be eligible for receiving larger transfers. Secondly, in order to receive greater Central transfers, local authorities may spend more time and resources in building relations with the upper level governments rather than investing in the local economy (Zhang, 2006). In yet another study by Huan & Chen (2012), the authors tried to find equalizing impact of different components of inter-governmental transfers using generalized method of moment (GMM) developed by Arellano & Bond (1991) for 27 provinces and 3 municipalities in China. The authors

found that China's inter-governmental transfer system that was established in 1994 due to a policy of re-centralization of revenue resources did have some equalizing effects. To a great extent the equalizing effect was attributed to the removal of tax rebates that were common in the pre-1994 system and to a small extent it was attributed to rule-based general purpose transfers. However, the equalization effects of the largest part of transfers that are the specific purpose transfers, were anti-equalizing (they basically were not rule-based and were influenced by political decisions) and hence total transfers exhibited significant anti-equalization effects on the whole. Yao (2009) also finds, based on the data from 2002, that the transfers produced an anti-equalization effect in China that were in favour of urban recipients with larger revenues and promoted rent-seeking activities in rural recipients with lesser revenues.

Many other studies in China noted that regional fiscal inequality remained high after the 1994 fiscal reform, but they produced mixed results with regard to the equalization impact of Central transfers (Cao & Luo, 2006; Knight & Li, 1999; Tsui, 2005; Yu & Tsui, 2005). However Zhang (2006) found that fiscal transfers in China have led to only partial equalization, although inequality in per capita provincial expenditures is less pronounced than before the 1994 reforms.

Martinez-Vazquez & Timofeev (2007) compared the extent of inequality for 2000 Russian local governments before and after "equalization" that was undertaken through shared tax revenues and grants across regions. They found a significant decline in local fiscal disparities in some regions while almost no equalization was achieved in others.

Srivastava & Rao (2009) examined the redistributive impact of fiscal transfers of various Finance Commissions in India, by examining the rate of responsiveness of per capita transfers to changes in per capita GSDP for fourteen general category states. They found that the most equalising schemes were those of the Eleventh Finance Commission, followed by the Twelfth, Ninth and Tenth Finance Commissions,

respectively. All the transfer schemes obtained a negative coefficient suggesting that the overall system was successful in achieving horizontal equity.

2.8.2 Impact of Inter-governmental Transfers on Tax Effort of Recipient

Governments

This section deals with previous empirical studies regarding the impact of Central transfers on state tax effort. Buettner & Wildasin (2006), Courchene (1994), Dahlby & Warren (2003), Rajaraman (2000), Snoddon(2003) and Zhuravskaya (2000) have showed that conditional vertical transfers as well as equalizing transfers have a negative effect on local tax effort. On the other hand Dahlberg et al., (2007) while controlling for probable endogeneity of grants in their study did not find any convincing evidence for either crowding-in or crowding-out effect of transfers on tax revenues. Mogues, Benin, & Cudjoe (2009) used a ten year panel data on 110 districts in Ghana and found that even with the presence of incentives to raise taxes, transfers to local governments actually discouraged own revenue collection. The authors found that larger past external transfers significantly and negatively impacted on local governments' own revenue. Zhuravskaya (2000) found a negative effect of transfers in Russia, where each unit of own tax collected by a local government is offset by 0.9 units of transfers hampering tax efforts of local governments. Buettner & Wildasin (2006) found that in the US, external grants led to reductions in own-revenue generation by local governments.

Binswanger et al. (2012) used panel data of 1999 and 2006 surveys of Rural Economic and Demographic Survey (REDS) conducted by the National Council for Applied Economic Research in India and found that reallocation of restricted social grants to employment generating grants, increases tax effort of local governments. The authors also found that every rupee reallocated from restricted to block grants led to an increase in own taxation by 0.65 rupees. Some studies have found a negative effect of Central

transfers on the state revenue income in India (Naganathan & Sivagnanam, 2000; Panda, 2009). Garg et al.(2014) study on 14 major Indian states for the time period 1992 to 2010 found that inter-governmental transfers have a negative impact on tax efficiency of states. Dash & Raja (2013) disaggregated transfers into conditional and unconditional transfers and tried to see their effect on direct and indirect taxes amongst states in India. Their results revealed that the tax collection is negatively influenced by unconditional transfers. They also found that direct tax collection is more responsive to these transfers.

2.8.3 Political Influence on Inter-governmental Transfers

We now examine the impact of political factors in the distribution of Central transfers. Wright (1974) was one of the first who tried to indicate that political factors significantly affected the allocation of federal transfers across US states. The author found that the electoral votes had a significant positive impact on the New Deal spending per capita across states. In another empirical study in the USA, Grossman (1994) found that political capital of the states influenced the grants to states. The author found that political variables like party affiliation between the national and state government, the size of the majority of the affiliated party in the state legislature, and the size of the state government and union membership were all found to be positively correlated with per capita grants. Similarly in Australia it was found that some transfers were not determined by the fiscal equalization formula but were influenced by political factors wherein states with greater political capital received more of these transfers (Worthington & Dollery, 1998). In Argentina, Porto and Sanguinetti (2001) found that provinces that had larger political representation in per capita terms at the Centre received greater share of the Central transfers as compared to other more populous but less represented states at the Centre.

Rao & Nirvikar (2001) provide evidence of the bargaining view of federalism in India, where states with greater bargaining power at the Centre receive greater per capita transfers. Khemani (2003) in his study of 15 major states of India, over the period 1972-1995 found that the discretionary transfers were influenced by political factors. Singh and Vashishtha (2004) using data for the time period 1983-92 found that states that had larger lobbying power with the Central government received larger per-capita transfers. Biswas et. al. (2010)'s study on 14 major Indian states for the period of 1974-75 to 2002-03, found a positive impact of state lobbying power on discretionary transfers from the Centre. Garg et al., (2014) studied the impact of effective number of political parties and concluded that the amount of transfers disbursed to states is inversely related to the Effective Number of Political Parties (ENP).

2.9 Conclusion

Our survey of literature across countries suggests that the impact of decentralization has been positive in some cases and negative in others in terms of its impact on economic growth and fiscal deficit. The impact of decentralization on various economic indicators varies across and depends on a host of factors like the level of development of the country, socio-economic factors, heterogeneous nature of the society, etc. However, there is a consensus amongst authors that the decentralization indicators that are constructed should reflect the level of autonomy in spending decisions and revenue collection to reflect the true level of decentralization.

Despite so many years of decentralization in India there seems to be only one empirical panel data study (Jin, 2009) that examines the impact of decentralization on economic growth at the sub-national level in India. However the definition of decentralization used therein is inadequate. In our study we use an improved measure of fiscal decentralization. Our study is also one of the first to use panel data technique to understand the impact of fiscal decentralization on state fiscal balances. In terms of

decentralization at the third tier level of governance only two studies (Asfaw et al., 2007; Kalirajan & Otsuka, 2012) have used a panel data model to understand the impact of decentralization on major socio-economic indicators in India. However both these studies have focused on the impact of rural decentralization but did not examine the overall impact of decentralization on state income at the third tier level of governance in India. Our study fills this gap. The reviewed literature suggests that inter-governmental transfers may have a positive or negative effect on state fiscal balances and state tax effort depending on the type of incentives it creates for sub-national governments. Only Bhatt & Scaramozzino (2013) have previously studied the causality between fiscal deficit and transfers in India. Our study improves on the methodology by using a fixed effects two stage least square instrumental variable model on a panel dataset for a longer time period 1981-2012 in order to understand the impact of transfers on fiscal deficit.

With regard to impact of transfers on state tax effort there are quite a few studies, for example Dash and Raja (2013); Naganathan and Sivagnanam (2000) & Panda (2009). However these studies fail to disaggregate the transfers according to the type of institution by which they are determined. There have also been empirical studies that have analysed the impact of political variables on Central transfers to the states in India (Biswas et. al., 2010; Garg et al., 2014; Khemani, 2003; Rao & Nirvikar, 2001 & Singh and Vashishtha, 2004). All these studies are undertaken for a shorter time period and are dated except for the study of Garg et al. (2014). However Garg et al. (2014) analyses the impact of political variables on total transfers with and without Central loans. Our study improves on this by disaggregating the Central transfers by the institution that disburses them, that is Planning and Finance Commission transfers besides total transfers and therefore will provide new insights. The reason for separating them by institution is that different rules govern their disbursement.

In the next chapter we discuss in detail the research methodology used in the thesis. We explain the different econometric models and tests that are used later in the thesis with regard to panel data sets. We examine the standard measures that are used to check fiscal inequalities across regions

Chapter 3

Research Methodology

3.1 Introduction

In this chapter we discuss the various econometric tests and measure the fiscal inequalities relevant for our study and the theory on which they are based. Our study undertakes a panel data analysis using 14 non-special category states in India for the time period 1981-82 to 2012-13. Panel data is more widely used in recent years due to the easy availability of data both in developing and developed countries (Hsiao, 2003). We have also used different tools to measure fiscal inequalities for 14 major non-special category states in India. We have devoted a special section to compute fiscal inequalities at the taluka level for Goa.

3.2 Regression Tools and Theory

Panel data can be described as arrangement of data in such a way where several entities are observed at two or more time periods. These entities could be firms, individuals, states or countries. Panel data is also known as longitudinal data or “cross-sectional time series data” (Torres -Reyna, 2007). It is a data set constructed by repeated observation of the same cross-sectional units across time (Wooldridge, 2002). Panel data sets can be of two different types, namely balanced panel wherein each cross-sectional unit is observed for the same time periods while in the other type known as “unbalanced panel”, cross-sectional units are observed for different time periods. A balanced panel comprises of equal time periods across all the units, if they are not equal then it is called an unbalanced panel (Mayer, 2010).

The data format for panel data set can be expressed as follows: (Hsiao, 2003):

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_{it} + u_{it} \quad (3.1)$$

where observational units $i=1,\dots,N$ and time periods $t=1,\dots,T$. If $t=1$ and $i \neq 1$ then the data set would be cross sectional data and if $i=1$ and $t \neq 1$ then it would be a time series data set.

Researchers have been able to use panel data models to analyse issues and arrive at findings that could not be studied in either pure cross-sectional or time-series settings alone. Compared to pure cross sectional and pure time series analysis, panel data has a number of advantages which are summarized below.

Economic behaviour is innately dynamic and hence most econometrically interesting models are explicitly or implicitly dynamic (Nerlove, 2002). In production function analysis researchers for a long time were not able to separate the effects of economies of scale and technological progress. While through cross-sectional data information only about the former can be captured, through time-series data both these effects are mixed up with no possibility of separation. In order to deal with this problem it was assumed that the production function had constant returns to scale so as to measure the technical change. Panel data analysis has shown that this might not be the case. On the other hand, while using panel data on costs or output for a number of firms, can provide information about the rate of technological change and scale economies for different sized firms in the sample at each point in time.

Panel data can thus be used to concurrently identify the effect of time-varying variables (for example technology) and cross-sectional variables (for example economies of scale) (Greene, 2010). Hence even in case of capturing the complexity of human behaviour panel data models have greater capacity for modelling such effects (Hsiao, 2006). For example while assessing the effectiveness of social programs if we use cross-sectional data, it would not concurrently capture what happens to an individual when she receives the treatment and when she does not. In such a case an individual is seen as either receiving or not receiving the benefits of social programs. Using this difference

between the two groups could lead to selection bias due to differences in observable factors between them and selection bias due to problems of endogeneity of the participation of groups covered by the programme. If panel data over this time period is available, it would enable researchers to observe the before and after effects on individuals (Hsiao, 2006).

- Panel data provides greater variability in terms of data collected and is thus more efficient and accurate in the estimation of parameters. As compared to cross-sectional data, panel data have a larger number of observations which results in the standard deviations becoming smaller and thus provides more significant estimates. In fact, panel data tests use a more sophisticated behavioural model with fewer restrictive assumptions (Baltagi, 2008; Hsiao, 2003).
- In the case of pure time series data, serious problems of autocorrelation crop up among independent variables, where current period independent variables are highly correlated with those in the previous period. However for panel data, differences in the independent variables observed across cross sectional units can be used to reduce collinearity between current and lag variables to arrive at unrestricted time-adjustment patterns (Pakes & Griliches, 1984). The clubbing together of cross sectional and time series data increases variability that can be then decomposed into variation between units and variation within units (Baltagi, 2008; Hsiao, 2003).
- Individual heterogeneity can be accounted for using fixed effects panel model. Many times it happens (specially in the case of countries and states) that each cross-sectional unit has some intrinsic and immeasurable features distinguishing it from others (Kennedy, 2003). The panel data model reduces problems caused by the wrong measurement of variables or omitted variables that correlate with the independent variables included in the model. However fixed effects model can only

be used assuming that the unobserved factors that are correlated with the independent variable remain constant over time though they vary across cross-sections (Baltagi, 2008; Hsiao, 2003)

The main problem with panel data is that it generally needs additional time and cost to collect and compile the data, and it does create some econometric challenges (Wooldridge, 2002).

3.3 Panel Data Methods

We discuss below some of the panel data econometric models which are commonly used and also relied on in this study; Pooled Ordinary Least Squares (POLS), Random Effect Estimator (REM), Within Estimator (FEM), and Two Stage Least Square Method (2SLS).

3.3.1 Pooled Ordinary Least Squares (POLS)

Econometric models that can be estimated using a pooled ordinary least square estimator are written as:

$$y_{it} = \beta x_{it} + \alpha z_i + \varepsilon_{it} \quad (3.2)$$

where $i=1, 2, \dots, N$ and $t=1, 2, \dots, T$

Here y_{it} represents the dependent variable, x_{it} are K independent variables not inclusive of a constant term. The heterogeneity or individual effect (if any) is captured by αz_i . The term z_i comprises of a constant as well as individual/ group specific variables, which are time invariant and which may or may not be observed. Thus if “ z_i ” comprises of only a constant term, then the Ordinary Least Squares (OLS) model will give us efficient and consistent α and β estimates. Sometimes “ z_i ” is unobserved but may be correlated with x_{it} . Then the OLS model would be inappropriate to use as the least squares estimator of β would be biased and inconsistent due to an omitted variable. The pooled model is also known as the population averaged model and it can be used only when the assumption that any underlying heterogeneity has been averaged out is fulfilled. In short

when assumptions of the classical model are satisfied which include zero conditional mean of ε_{it} , homoscedasticity, independence across units, and strict exogeneity of independent variables, then the pooled ordinary least squares will give efficient estimates (Greene, 2010).

3.3.2 Random Effects (RE) or Generalised Least Square (GLS) Method

When the researcher feels that certain variables that are omitted may vary over time but are constant across subjects, while certain other variables may be time invariant but differ between subjects, then the use of the random effects model is recommended. In a RE model, the individual-specific effects are assumed to be random. Hence, the model is written as:

$$Y_{it} = \mu + \beta X_{it} + v_{it} \quad (3.3)$$

$$v_{it} = a_i + u_{it} \quad (3.3a)$$

Wherein " a_i " stands for the individual-specific time constant variable and u_{it} stands for the effects of omitted variables that vary across individuals and time. In such a situation, " a_i " is distributed independently and identically (IID) with mean zero and a constant variance. A random effects model is resorted to when the researcher feels that the unobserved effect " a_i " is not correlated with each explanatory variable.

The properties of a_i are as follows:

$$E(a_i) = E(u_{it}) = 0 \quad (3.4)$$

$$E(a_i a_j) = \sigma_a^2 \text{ if } i=j \quad (3.4a)$$

$$E(a_i a_j) = 0 \text{ if } i \neq j \quad (3.4b)$$

$$E(u_{it}, u_{js}) = \sigma_u^2 \text{ if } i=j, t=s \text{ and } 0 \text{ (otherwise)} \quad (3.4c)$$

$$E(a_i, x_{it}) = E(u_{it}, x_{it}) \quad (3.4d)$$

Hence, it displays serial correlation over time between disturbances of the same individual because v_{it} and v_{is} both have a_i , and therefore the residuals are correlated.

Thus the Generalised Least Squares (GLS) estimator is used to arrive at an efficient estimate (Pattanaik & Nayak, 2014).

3.3.3 Within Estimator or Fixed Effects (FE) Estimator

When there exists a correlation between unobserved characteristics and some of explanatory variables used in the model it will lead to the RE estimator resulting in biased and inconsistent estimates. To solve this problem the “within estimator or fixed effect estimator” model is used. This method computes deviations from individual means and by doing so, even if a correlation between unobserved factors and some explanatory variables exists, the within effects estimator will produce unbiased and consistent estimates.

FE regression allows researchers to find out the effects of the independent (X) variables on the dependent variable (Y) from the changes of variables with time. This method is mostly commonly used method for panel data analysis. FE method is resorted to when there is need to control for omitted variables that vary between observation units but do not change over time. This method is similar to running a linear regression using dummy variables for every subject in order to capture their fixed effects. This method is most efficient when there are relatively fewer observation units and greater time periods, as each dummy variable results in the loss of degrees of freedom from the model. In our study, time-specific effects are not controlled for and the emphasis is only on individual-specific effects. Thus, the dependent variable, depends on the K^{th} exogenous variables ($X_{1it}, X_{2it}, \dots, X_{kit}$) that differ across individuals at time “t” and also display variation across time, but the variables specific to the i^{th} unit remain constant over time (Pattanaik & Nayak, 2014).

The fixed effect model can be expressed as follows:

$$y_{it} = \sum_{k=1}^K \beta_k x_{itk} + \alpha_i + u_{it} , \quad (3.5)$$

$$t = 1, 2, \dots, T, \quad i = 1, 2, \dots, N$$

Where α_i stands for individual effects that are fixed over time and u_{it} denotes the error terms. The fixed effects transformation takes the difference from the mean as follows:

$$y_{it} - \bar{y}_{it} = \sum_{k=1}^K \beta_k (x_{itk} - \bar{x}_{it}) + (u_{it} - \bar{u}_{it}) \quad (3.6)$$

Now the unobserved effect α_i no longer exists and hence can lead to unbiased and consistent results. It is assumed that u_{it} is uncorrelated with X_{it} and is an IID random variable with mean zero and constant variance (Pattanaik & Nayak, 2014).

The fixed effects and the random effects estimators report three Goodness of Fit Measures (Adjusted R-squared) as follows (Stata, 2005):

- 1) Within R-squared which is derived from the mean deviated regression that is from running OLS on transformed data. The within R-squared is calculated from individual mean de-trended data which does not take into account all between information in data
- 2) Between R-squared which is calculated in stages. In the first stage, fitted values using the fixed effects parameter vector and the within-individual means of the independent variables are calculated. In the next stage the R-squared is calculated as a squared correlation between these predicted values and within-individual means of the original dependent variable. In the case of between R-squared, time component is not taken in account and this is done by taking means of the variables for each panel unit individually. The R-squared derived from regressing this time de-measured data provides the between R-squared. The regression of Y_i

on X_i where time is left out by taking averages of data and it leaves out the within information.

- 3) Overall R-squared which is calculated by first computing the fitted values using the fixed-effects parameter vector and the original untransformed independent variables. Next the R-squared is calculated as a squared correlation between those predicted values and the original dependent variable. The overall R-squared is the usual R-squared which is estimated by regressing the dependent variable Y_{it} on the explanatory variables X_{it} . Hence it takes in account different cases over time.

The within estimator has two major limitations:

- It will not estimate the time invariant variables that are eliminated by transformation of data (deviations from mean).
- From an entirely practical viewpoint, the dummy variable method is costly as it leads to the loss of degrees of freedom (Greene, 2010).

3.3.4 Difference between Fixed Effects (FE) and Random Effects (RE)

(a) The most elementary difference between FE and RE is that of inference. By a fixed-effects analysis, we can only support inference about the group or subjects that we are looking at in that particular sample. A random-effects analysis on the hand enables us to deduce something about the population from where the sample has been drawn from. Hence a fixed effects analysis on a random sample, does not allow us to make inferences beyond the data set. On the other hand, the random effects model assumes normal data distribution, and thus conclusions can be drawn about the larger population from where this sample is drawn.

(b) Another major difference is with regard to the assumptions of these two models. FE model assumes that the individual specific effects are indeed correlated to the independent variables. On the other hand, the RE model assumes that the individual specific effects are not correlated with the independent variables used in the analysis.

The FE model offers consistent estimators however does not allow to estimate variables that do not vary with time, as it is based on the within operator. It deducts from the variables their mean over time, so in such a situation time-invariant variables will have a mean identical to their value and hence leads to a null value of the within transformation of these variables. The RE model does enhance the efficiency of estimations but it works under the strong assumption that individual effects are not correlated with explanatory variables.

3.4 Estimation Issues

3.4.1 Heteroskedasticity

It is essential to test for the presence of heteroskedasticity because when OLS method is applied to heteroskedastic data it is no longer a minimum variance estimator. Heteroskedasticity often occurs in data in which there is a big difference between the largest and smallest observed unit. The greater the size of observations in a sample, the greater is the possibility that the error terms associated with them will have different variances and therefore be heteroskedastic. That is, it is likely that error terms for very large observations might be taken from distributions with large variances, while the error terms for small observations might be taken from distributions with lesser variances. In general, heteroskedasticity is more likely to exist in cross-sectional data rather than time series data. This occurs because for cross-sectional data the observations are from the same time frame but are from different entities (individuals, states, countries) and hence such data can easily include a large range between the largest and smallest values. Since panel data also consists of cross-sectional units it also can have the problem of heteroskedasticity.

Pure heteroskedasticity is a function of the error term of a rightly specified regression equation and on the other hand impure heteroskedasticity occurs due to specification error – like an omitted variable.

3.4.2 Consequences of Heteroskedasticity

Heteroskedasticity does not result in the coefficient estimates being biased. Even though error terms of an equation are found to be purely heteroskedastic, the coefficients of the OLS regression will not be biased. However lack of bias does not ensure accuracy of the coefficient estimates specially because heteroskedasticity enhances the variance of the $\hat{\beta}$ distributions and hence it does affect the minimum variance property. If the error terms of an equation are heteroskedastic with respect to a proportionality factor Z:

$$\text{VAR}(\varepsilon_i) = \sigma^2 Z^2 \quad (3.7)$$

then the variance of $\hat{\beta}$ is a function of Z:

$$\text{VAR}^{**}(\hat{\beta}_k) = f(Z^2) * [\text{VAR}(\beta_k)] \quad (3.8)$$

Where $\text{VAR}^{**}(\hat{\beta}_k)$ is the variance with heteroskedasticity, Z is the proportionality factor causing the heteroskedasticity. Here $f(Z^2)$ represents a positive function of Z and $\text{VAR}(\hat{\beta}_k)$ is the variance in the absence of heteroskedasticity.

In the presence of heteroskedasticity, OLS regression leads to underestimation of the variances and standard errors of the coefficients. Tests of hypothesis using “t” or “F” tests are not reliable in the presence of heteroskedasticity. Hence, OLS usually reports larger “t” scores than would have been obtained if the error terms were homoskedastic leading to rejection of the null hypothesis when it should not be rejected (Studenmund, 2000).

3.4.3 Serial Correlation

Serial correlation means that the error term in a certain time period is dependent in some systematic manner upon the error terms from other time periods. Serial correlation also known as autocorrelation which can exist in any data and is most prevalent in time series data. Pure serial correlation is said to occur when the errors are correlated with

each other in a rightly specified equation. Impure serial correlation results from specification error such as an omitted variable or an incorrect functional form.

When expected value of the product of any two error terms is not equivalent to zero then the error terms are said to be serially correlated to one another. The most common type of serial correlation is the first order autocorrelation wherein the current period's error term is correlated to the previous period's error term. The consequences of serial correlation are similar to those caused by the presence of heteroskedasticity. It does not lead to bias in the coefficient estimates, but it increases the variance of the $\hat{\beta}$ distributions and causes OLS to underestimate the variances and standard errors of the coefficients (Studenmund, 2000).

3.4.4 Multicollinearity

Multicollinearity can be described as a linear functional relationship between two or more independent variables which is so strong that it can influence the regression results. When there is multicollinearity amongst variables, the estimates will still remain unbiased this means that the estimates of $\hat{\beta}$'s will be centered around the true population β 's. However multicollinearity is likely to increase the variance of the estimates. In the presence of multicollinearity it is likely to obtain an estimate of $\hat{\beta}$ that is considerably different from the true estimate of β . For example multicollinearity enhances the possibility of obtaining an unexpected sign for a coefficient though multicollinearity does not cause any bias. Multicollinearity also tends to lower the t-score of the estimated coefficients mainly because of the way the t statistic is calculated as follows:

$$t_k = \frac{\hat{\beta}_k - \beta_{H0}}{SE(\hat{\beta}_k)} \quad (3.9)$$

When variance increases due to multicollinearity, it in turn increases standard error of the estimated coefficients. As can be seen in the formula above, when the standard error

increases it will cause the t-statistic to fall. In fact it is quite common to have low “t” scores in the presence of with severe multicollinearity. Even when the individual “t” statistic is quite low in a multicollinear equation, the overall fit of the equation (measured by R-squared) will not change much.

One of the first signs of severe multicollinearity is the presence of high R-squared combined with low t values for the individual regression coefficients. Another way to identify severe multicollinearity is to check the simple correlation coefficients (r) between the explanatory variables. If the r’s are high then the respective independent variables are highly correlated and this is a situation of multicollinearity. Since multicollinearity is a sample phenomenon the textbook recommendation is to increase the sample size to lower the degree of multicollinearity. In such situations neither dropping nor inaction is useful, however sometimes it is possible to transform certain variables to lower the degree of multicollinearity. The two most popular transformations are either forming a linear combination of the multicollinear variables or to transform the variables into their first differences (Studenmund, 2000).

3.5 Solutions

There are solutions to the commonly observed problems discussed above. We discuss a few below:

3.5.1 Robust Standard Errors

The aim of econometric regressions is to get unbiased or consistent estimates. An elementary prerequisite for obtaining accurate statistical inferences, is in obtaining accurate standard errors (se). It has been stated that researcher should pay as much attention in getting good *se* as they do to obtain good β 's (Cameron & Douglas, 2015). According to some researchers only a rare dataset will actually satisfy all of the assumptions that are essential for a multiple regression analysis. Non-fulfilment of these assumptions will result in standard errors that are biased. Hence in order to account for

the flaws in the dataset, the researcher resorts to the use of robust standard errors. The robust option is used to effectively control minor problems regarding lack of normality of data distribution, heteroskedasticity and outliers. When a regression is run using the robust option, the resultant coefficient estimates are equivalent to the estimates from an ordinary OLS. However, since the robust errors are used to deal with lack of normality of data distribution and heterogeneity, the regression will produce standard errors and t-scores that are different as compared to OLS regression. If one compares the robust regression results with the OLS results undertaken for the same equation, and there is not much difference in standard errors, t values and p values of the two regression results then it suggests that the problems in data were indeed insignificant. However when the results differ significantly, the results from robust regression should be chosen over OLS regression as they are considered to be more reliable (idre, 2017; Wooldridge, 2002).

3.5.2 Regression with Cluster Option

A standard OLS regression is based on the assumption of independence of residuals. In our study with a panel data model for 14 different states for three decades it is highly probable that observations may be correlated with each other within each state or region. Hence the researcher can use the cluster option which controls for the possibility that observations within each state may not be independent even if they are not correlated across states. (While using the cluster option the researcher need not use the robust option since it is implied with cluster). When cluster option is used the standard errors may differ greatly from the OLS, even more than the standard errors of the robust regression. However if the dataset has very small number of clusters relative to the total sample size it is possible that the standard errors could be considerably bigger as compared to those of the OLS regression. Hence for such datasets the cluster option may not be feasible (idre, 2017, Wooldridge 2002).

3.5.3 Different Types of Variance Estimators

Following are the formulas of three different types of variance estimators used in our study:

- a) Variance estimator for a simple OLS regression (Var_{OLS}):

$$\text{Var}(\text{OLS}) = s^2 * (X'X)^{-1} \quad (3.10)$$

Here, s^2 represents the sample population variance and is expressed as follows:

$$s^2 = \left(\frac{1}{N-k}\right) \sum_{i=1}^N e_i^2 \quad (3.11)$$

Here k represents the number of variables and N represents the number of observations.

x_i stands for a row vector of predictors inclusive of the constant and e_i represents the residual component for unit i .

- b) Robust estimator ($\text{Var}_{\text{robust}}$):

$$\text{Var}(\text{robust}) = (X'X)^{-1} * \left[\sum_{i=1}^N (e_i * x_i)' * (e_i * x_i) \right] * (X'X)^{-1} \quad (3.12)$$

- c) Clustered Robust estimator ($\text{Var}_{\text{cluster}}$):

$$\text{Var}(\text{cluster}) = (X'X)^{-1} * \sum_{j=1}^{N_{cs}} u_j' * u_j * (X'X)^{-1} \quad (3.13)$$

Here $u_j = \sum e_i * x_i$ for the j^{th} cluster

and N_{cs} stands for the number of clusters

Hence the clustered estimator is nothing but the robust estimator where instead of individual $e_i * x_i$'s (in the case of robust estimator) their aggregates over each cluster are used (Sribney, 2013).

3.6 Hypothesis Testing and Model Selection

3.6.1 Breusch-Pagan Lagrange Multiplier (LM) Test for Random Effects

The LM test is used to select between a RE model and a plain OLS regression model. In the LM test, the null hypothesis states that the variance across units is zero. This means that there is no significant difference across units therefore there is no panel effect. If the null hypothesis result is significant (that means the null hypothesis of no significant differences across units is rejected) then the OLS model is not appropriate, and RE model is better (Breusch & Pagan, 1980).

3.6.2 Fixed Effect versus Random Effect (Hausman Test)

One of the desirable characteristics of the FE model is that it accounts for the unit-specific effects that are correlated with the independent variables. Thus it clearly accounts for one type of endogeneity that is caused by time invariant omitted variables. An alternative to the RE is the FE model. The RE model assumes that the unit-specific effect is not correlated with the independent variables. Hence, there is no harm in ignoring it or there is no omitted variable bias and it just becomes part of the residual. When the assumptions of the RE model are fulfilled this model becomes more efficient than the FE model. However, if the RE assumptions are violated, then the RE model will be biased. On the other hand, FE model will be unbiased but it will be inefficient. Normally the Hausman test method is used to choose between the RE and FE models (Hausman, 1978). The null hypothesis states that there is no correlation between unobserved factors and some of the explanatory variables. If the unit specific effects are correlated with any of the explanatory variables the random effects estimates will be biased. Since FE model is consistent when unobserved effects are correlated with the independent variables, but RE is inconsistent, a statistically significant value of the χ^2 in the Hausman test is interpreted as a confirmation against the use of RE assumption of strict exogeneity of the independent variables. Although the FE model always gives

consistent results, its drawback is that it is not the most efficient model. On the other hand the RE estimator is more efficient and will generate better P-values. Hence the RE model is preferred if the exogeneity criteria is satisfied.

The Hausman test is calculated as a χ^2 type test for differences in estimates which is expressed as follows:

$$\chi^2(df) = (\hat{\beta}_{FE} - \hat{\beta}_{RE})' [Avar(\hat{\beta}_{FE}) - Avar(\hat{\beta}_{RE})]^{-1} (\hat{\beta}_{FE} - \hat{\beta}_{RE}) \quad (3.14)$$

When robust clustered standard errors are used in the regression the Hausman test cannot be used. Alternatively, a different test (`xtoverid`) is used to choose between the RE and FE model in Stata. The test reports the Sargan Hansen statistic if the original estimation was robust. Hence unlike the Hausman test, the test reported by Sargan statistic can be used for heteroskedastic and cluster robust versions. A FE model uses orthogonality criteria that the regressors are independent of the idiosyncratic error term (u_{it}). In terms of the RE model additional orthogonality criterion are used which states that the regressors are independent of group specific errors (u_i). These additional orthogonality criteria used for the RE model are over-identifying restrictions. Hence the test to choose the more appropriate model between RE and FE model can be considered as a test of over-identifying restrictions. The null hypothesis of the Sargan Hansen test (like the Hausman test) states that the RE model is more appropriate and the alternate hypothesis states that a FE model is more appropriate (Schaffer & Stillman, 2014).

3.6.3 Testing for Heteroskedasticity in Panel Data

The Wald test is used to determine whether the data exhibits heteroskedasticity or whether variance is constant for the entire sample. For the Wald test the null hypothesis states that there is constant variance (or the data is homoscedastic) and the alternate hypothesis states that there is heteroskedasticity (or that the variance is not constant across the data sample). If the P-value of Wald test is significant, it indicates the presence of heteroskedasticity.

3.6.4 Testing for Serial Correlation for Panel Data

Serial correlation tests are applied mainly to panel data with a long time series and autocorrelation is not a problem for data with very few years. A Lagrange-Multiplier test is normally used to test for serial correlation. The null hypothesis states that there is no serial correlation and the alternate hypothesis states that there is serial correlation.

3.7 Endogeneity

Endogeneity can be described as a situation when there exists a correlation between independent variables and the error term which will lead to inconsistent OLS estimates (Baum, 2009).

The problems caused by endogeneity for econometric analysis are similar to those caused by omitted variables, or by measurement errors of the explanatory variables. Hence endogeneity can also be caused due to the problem of omitted variables or measurement error of independent variables. The former may arise in cases where a variable which is known to be significant in the regression equation is not measurable, and no appropriate proxies can be found in its place. However in all these cases, OLS is not able to provide consistent results as the independent variables are correlated with the error term. A general solution to the problem of endogeneity is the application of instrumental variable model. A widely used form of this estimator is the two-stage least squares (2SLS) method (Wooldridge, 2010). 2SLS method enables the researcher to get consistent estimates in the presence of endogeneity.

3.7.1 Instrumental Variables (IV) Regression

An instrumental variable (z) has the property that it is not correlated with “ u ” but is correlated with “ x ”. A variable that meets those two characteristics can be considered as an instrumental variable. However if there is a weak correlation between x and z variables, then it will create a sizable bias in the estimator. This is called the weak instruments problem. Further, if there is any correlation between the instrumental

variable and the error process, a weak correlation between x and z will cause the instrumental variable estimates to be inconsistent. There is no mechanism to determine the correlation between z and u , but we can check the correlation between the x and z , (Wooldridge, 2010).

Importantly the R-squared value that is derived from the IV estimator is not the same that is normally obtained in an OLS regression. As there exists a correlation between x and u , it is not possible to decompose the change in the dependent variable into two independent components Sum of Squares due to Error (SSE) and Sum of Squares due to Regression (SSR). Therefore, R-squared has no natural interpretation. In the case of an OLS regression, a joint hypothesis test can be specified in terms of R-squared measures; however this cannot be done in the context of an IV regression. Just as the asymptotic variance of an instrumental variable estimator surpasses that of OLS, the R-squared measure from IV can never match the measure calculated by OLS (Wooldridge, 2010).

3.7.2 IV Estimates and Multiple Regressions

There can be situations when there is a single endogenous explanatory variable but it has more than one potential instrument. There might be several variables that are significantly correlated to the endogenous variable but are not correlated with “ u ”. Here, depending on the choice of instruments we will get different IV estimates, with varying degrees of precision. This is not a very attractive option, since it means that depending on how one implements the IV estimator, it might provide varied conclusions about the structural model. The technique of two-stage least squares (2SLS) deals with this problem. Here we can combine several instruments to implement the IV estimator. An auxiliary regression is considered as the first stage of 2SLS where available instruments included as explanatory variables. The predicted values of this regression, will serve as the instrument for the endogenous variable. In the second stage, the researcher uses the IV estimator, by using the generated instrument in place of the endogenous variable.

The 2SLS estimation technique will always produce a unique set of parameter values for a given instrument list (Wooldridge, 2010).

We use Stata in this study wherein the `xtivreg2` command performs 2SLS regression.

The syntax of IV regression is as follows:

$$\text{Xtivreg2 depvar [varlist1] (varlist2=varlist iv)} \quad (3.15)$$

Wherein `depvar` represents the dependent variable; `varlist1` denotes the list of included exogenous variables ; `varlist2` includes endogenous variables and `varlist iv` comprises of the list of instruments that are not included in the equation, but will be utilized to create the instrumental variables estimator.

The `bw(#)` command along with “robust” command provides estimates that are robust to both arbitrary heteroskedasticity and arbitrary autocorrelation for the IV regression (Stata, 2016). Hence while using the `xtivreg2` command it is possible to get robust estimates as well as run the FE model.

The 2SLS estimator may be used on a more complex model, where there are multiple endogenous explanatory variables, as well as any number of instruments and included exogenous variables. However, the constraint that must always be fulfilled is with regard to the order condition for identification, that is for each included endogenous variable there must be at least one good instrument. In situations when the number of included endogenous variables is exactly equal to the number of instruments or excluded exogenous variables then it satisfies the order condition and the standard IV estimator will produce a solution. Such an equation is known to be exactly identified. When there are more instruments than required, the order condition is fulfilled with inequality, and is known to be overidentified (Wooldridge, 2010).

3.7.3 Additional Tests for Instruments

An additional test used for the 2SLS panel regression is a test of over-identifying restrictions known as the Sargan-Hansen test. According to the null hypothesis of this

test, the instruments used are appropriate for the equation -that is they are not related to the residual and that excluded instruments are appropriately used. The test statistic follows a chi-squared distribution under the null hypothesis with (L-K) overidentifying restrictions. If the null hypothesis is rejected it means that the instruments used may not be appropriate. On the other hand if there are fewer instruments than required, then it fails to fulfil the order condition, as there are more unknowns than equations. No econometric procedure can solve this problem of under-identification and the only solution is to have at least one instrument for every endogenous variable used. There are additional conditions for identification, the order condition is necessary, but not a sufficient condition as it also might be that each instrument has a non-zero partial correlation with the dependent variable. This would not work, for example, if one of the instruments was a linear combination of the included exogenous variables.

When errors are assumed to be independently and identically distributed (i.i.d.), the test for weak identification which is provided by `xtivreg2` is an F version of the Cragg-Donald Wald statistic. If the i.i.d. assumption is not valid as researcher expects heterogeneity or autocorrelation then in such a case the `xtivreg2` will be invoked with the `robust`, or `cluster` options, and the Cragg-Donald-based weak instruments test is no longer applicable. `xtivreg2` instead reports an equally robust “Kleibergen-Paap Wald rk F statistic”. The critical values reported by `xtivreg2` for the Kleibergen-Paap statistic are the Stock-Yogo critical values for the Cragg-Donald i.i.d.case. Again if the Kleibergen-Paap rk Wald F statistic is greater than the Stock-Yogo weak ID test critical values it means that the instruments are not weakly identified.

We now turn our attention to some other techniques we have used in our study.

3.8 Measures of Inequality

Our study has applied some widely used measures of inequality in expenditure components and inter-governmental transfers at the sub-national and local level. These are described below.

3.8.4 Coefficient of Variation

1) Coefficient of variation: $Cov = \frac{1}{\bar{y}} \left[\frac{1}{n} \sum_{i=1}^n (\bar{y} - y_i)^2 \right]^{\frac{1}{2}}$ (3.16)

and its variant the

2) Population Weighted Coefficient of variation :

$$WCov = \frac{1}{\bar{y}} \left[\sum_{i=1}^n p_i (\bar{y} - y_i)^2 \right]^{\frac{1}{2}} \quad (3.17)$$

Here, \bar{y} represents the average national expenditure per capita, y_i denotes the per capita expenditure of each state i , p_i represents the share of the country's total population in state i and n is the number of states in India (Song, 2013)

These two measures of inequality have significant economic implications. In the case of the coefficient of variation measure, each state is given the same weightage with regard to inequality irrespective of whether the state has a larger or smaller population. On the other hand, when the population weighted coefficient of variation is used, weights are assigned to the population size of each state. For example if a state has a small population a smaller weight is assigned to it in calculating the overall inequality. Thus even though the average per capita income of this state is far away from the mean, since this state has a small population size, it will not contribute much to the total inequality due to the population weight adjustment (Song, 2013).

3.8.2 Gini Coefficient

1) The Gini index is widely used in the inequality literature. The Gini coefficient value alters between 0, which reflects complete equality and 1, which means complete inequality (one individual has all the income and others have none). Graphically, the

Gini coefficient can be easily represented by the area between the Lorenz curve and the line of equality (World Bank, 2015). The unweighted Gini index is computed as follows:

$$Gu = \left(\frac{1}{2\bar{y}}\right) * \frac{1}{n(n-1)} \sum_i^n \sum_j^n |y_i - \bar{y}_j| \quad (3.18)$$

Where, y_i and y_j denote the expenditure per capita of regions i and j , respectively (Shankar and Shah, 2003). “ n ” represents the number of regions, and \bar{y} represents the unweighted mean of the per capita expenditures. The unweighted Gini index assigns the same weightage to every region, that is every region is considered as one equal unit irrespective of its population size.

2) Weighted Gini Index

The weighted Gini index, which assigns weights to the regions’ per capita expenditures based on their respective population proportions, is calculated as shown below:

$$Gp = \left(\frac{1}{2\bar{y}}\right) * \frac{1}{n(n-1)} \sum_i^n \sum_j^n |y_i - \bar{y}_j| \left(\frac{P_i P_j}{P^2}\right) \quad (3.19)$$

Where $\bar{y} = \text{expenditure} / P$ which is the national mean per capita expenditure. P_i and P_j are the populations of regions i and j , respectively. P is the national population, and “ n ” the number of regions. Gini value ranges from 0 which means perfect equality to $(1 - P^*/P)$ for perfect inequality, where P^* denotes the population of the region which undertook the entire expenditure. If P^* is small compared to P then the value for perfect inequality would tend towards one.

One of the disadvantages of the Gini coefficient is that it is not additive across groups, i.e. the total Gini of a society is not equal to the sum of the Ginis for its sub-groups (World Bank, 2015).

3.8.3 Theil Index

Another commonly used measure of inequality is the Theil index which is part of a larger family of measures known as the General Entropy class (World Bank, 2015).

The Theil index is computed as follows:

$$\text{Theil}(T) = \sum_i y_i \log\left(\frac{y_i}{p_i}\right) \quad (3.20)$$

where y_i is the expenditure share and p_i is the population share of region “i”. For equal per capita expenditures, that is with expenditures proportional to a region’s population, this index takes a value of 0. In a situation where region “i” undertakes the entire expenditure, Theil becomes $\log(P/P_i)$ where P is the total population of the country, and P_i is the population of region “i”. Note here that as the population share of region “i” decreases, Theil increases if region “i” undertakes the entire expenditure.

Similar to the Theil “T” index is the Theil “L” index, which uses population share as a weight and is specified as follows:

$$\text{Theil}(L) = \sum_i p_i \log\left(\frac{p_i}{y_i}\right) \quad (3.21)$$

The Theil index of inequality has the benefit of being additive across subgroups or regions in the country. The Theil index, however, does not have a simple representation and lacks the attractive interpretation of the Gini coefficient. Although population weighted coefficient of variation is more sensitive to change than is population weighted Theil index, both measures generally show similar trends (Huan and Chen, 2012).

3.9 Chapter Summary

This chapter has provided an overview of different techniques that we will use in the empirical analysis later in our study. This review included both a review of data techniques for regression analysis as well as measures of inequality.

In the next chapter we try to understand the influence of fiscal decentralization on growth and development in India. We have constructed improvised measures of fiscal decentralization that reflect the true authority in spending and tax decisions of the states.

Chapter 4

Impact of fiscal decentralization

4.1 Introduction

In this chapter we discuss the impact of decentralization at the sub-national level on India's key economic and development indicators. The key economic indicators chosen for this study are Gross State Domestic Product (GSDP), fiscal deficit and outcome indicators that include Infant Mortality Rate (IMR) and Literacy Rate (LR). In order to capture different aspects of decentralization three separate measures have been constructed at the state level. These decentralization measures have been constructed in such a way that they reflect the spending and revenue decision making authority of the states covered in the study. All decentralization indicators have been expressed in per capita terms because of heterogeneity in state size and population so that the variables are comparable across states (Fan et al., 2004). The states included in the study are Andhra Pradesh (AP), Bihar and Jharkhand together (BJ), Gujarat (Gu), Haryana (Ha), Karnataka (Ka) Kerala (Ke), Madhya Pradesh and Chhattisgarh (MPC), Maharashtra (Ma), Odisha (Od), Punjab (Pu), Rajasthan (Ra), Tamil Nadu (TN), Uttar Pradesh and Uttarakhand (UPU) and West Bengal (WB). We have dropped Goa from the analysis because it is an outlier in per capita income terms and is a comparatively small state with low population. The newly formed states (Jharkhand, Uttarakhand and Chhattisgarh) have been merged with their original states (Bihar, Uttar Pradesh and Madhya Pradesh) for analytical convenience respectively.

4.2 Measures of Fiscal Decentralization

The first measure we use is an Expenditure Decentralization measure (ED). This does not include Central grants in state expenditure (both conditional and unconditional as it is difficult to separate the two). State governments in India might not have the authority with regard to spending decisions of grants from the Centre particularly for conditional

grants, though the expenditure is undertaken in the state. This is evident from the repeated requests of states to increase their share in central taxes (FC, various years).

This measure is calculated as follows:

ED = Aggregate expenditure of state 'i' minus Central grants to state 'i' in per capita terms (which is termed as state own expenditure per capita (pc) divided by the sum of aggregate Central expenditure per capita and the state own expenditure per capita. Here the Central per capita does not include aggregate state share in central taxes.

$$ED = \frac{\text{State own expenditure pc}}{(\text{State own expenditure pc} + \text{Central expenditure pc})} \quad (4.1)$$

The expenditure decentralization measure has been constructed based on the measure used by Qiao et al. (2008). Expenditure decentralization measure includes the states' share in Central taxes because though the state has no autonomy over the share in Central taxes in terms of revenue collection, however it has full autonomy in its expenditure decision. On the other hand while computing the Tax Decentralization (TD) measure, share in central taxes have been excluded as the state has no control (increasing or decreasing its revenue share) over the tax rate or base in terms of the revenue collection.

The TD measure is computed as follows:

TD = State own tax revenue per capita (pc) of state 'i' divided by sum of Central tax revenue per capita and state own tax revenue per capita.

$$TD = \frac{\text{State own tax revenue pc}}{(\text{Central tax revenue pc} + \text{State own tax revenue pc})} \quad (4.2)$$

Here Central tax revenue is revenue prior to transfers of the state share in Central taxes.

This measure is adopted from Oommen (2006) while measuring decentralization at the local level it has been modified suitably to measure decentralization at the sub-national level.

The third measure is the autonomy indicator (AUT) that reflects the autonomy of the state government expenditure and is based on the measure used by (Oommen, 2006) with some modifications. Autonomy indicator is calculated as follows:

$$AUT = \frac{\text{Tax Decentralization}}{\text{Expenditure Decentralization}} \quad (4.3)$$

The Table 4.1 contains summary statistics of the decentralization indicators. ED variable ranges from 0.29 to 0.70 and its average value is 0.51. This means that on an average the state per capita expenditure is very similar to the Central expenditure per capita. The mean of the TD variable is 0.38 indicating that the country is less decentralized in terms of tax revenue collection. The autonomy indicator has a mean of 0.71. Tamil Nadu scored the maximum on the autonomy indicator with a value of 1.05. Bihar scored the least on the autonomy indicator (0.29).

Table 4.1: Decentralization Variables for 14 States (1981-82 to 2012-13)					
Variable		Minimum	Average	Maximum	Standard Deviation
ED	within	0.29	0.51	0.58	0.04
	between	0.37		0.64	0.0
	overall	0.29		0.70	0.08
TD	within	0.30	0.38	0.46	0.03
	between	0.16		0.50	0.12
	overall	0.11		0.57	0.12
Autonomy	within	0.29	0.71	0.89	0.06
	between	0.43		0.91	0.14
	overall	0.29		1.05	0.15
Observations: N= 448, n =14, T= 32					

Table 4.2: Trends in Expenditure Decentralization and Tax Decentralization			
(1981-82 to 2012-13)			
Decentralization level	Average	Average	Average
	1981-82 to 1990-91	1991-92 to 2000-01	2001-02 to 2012-13
ED >0.5 and TD >0.5	Pu	TN, Pu, Ma, Ha, Gu	Ha, Ma, TN
ED >0.5 and TD <0.5	Gu, Ma, Ha, TN, Ka, Ke	Ke, Ka, AP, Ra,	AP, Gu, Ka, Pu, WB, Ra, Ke
ED <0.5 and TD >0.5	None	None	None
ED <0.5 and TD <0.5	AP, BJ, MPC, Od, Ra, UPU, WB	BJ, MPC, Od, UPU, WB	BJ, MPC, Od, UPU
Source: Author's calculations from EPWRF (Various Years)			

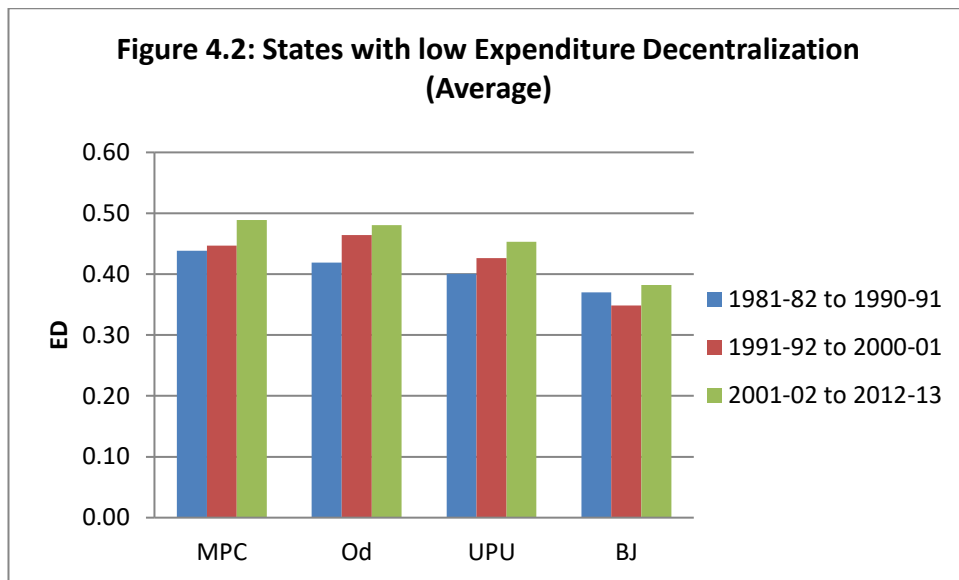
In Table 4.2 above states have been tabulated depending on the level of ED and TD achieved by them in the three decades. Those states with ED equal to or greater than 0.5 are considered to be highly decentralized as they spend equal to or more than the Centre in per capita terms. Similarly those states that have TD value equal to or greater than 0.5 are considered to be highly decentralized in terms of raising tax revenue as they are able to raise equal to or more taxes than the Centre on a per capita basis. In Table 4.2, it can be seen that no state that is having TD value greater than 0.5 has an ED value less than 0.5 indicating that ED precedes TD. States that have low ED as well as low TD throughout the period of study are BJ, MPC, UPU and Odisha which are low income states. Surprisingly during the period 2001-02 to 2012-13, Punjab and Gujarat slipped below 0.5 in terms of TD. On the other hand, states like Tamil Nadu, Maharashtra and Haryana have achieved high values of TD and ED from 1991-92 to 2012-13.

Table 4.3: Trends in Expenditure Decentralization 1981-82 to 2011-12 (Average)						
Rank	States	1981-82 to 1990-91	States	1991-92 to 2000-01	States	2001-02 to 2012-13
1	Pu	0.62	Pu	0.66	Pu	0.64
2	Ha	0.59	Ha	0.63	Ha	0.62
3	Ma	0.56	Gu	0.60	Ke	0.60
4	Gu	0.55	Ma	0.59	Gu	0.59
5	TN	0.51	TN	0.57	Ma	0.59
6	Ka	0.51	Ke	0.56	TN	0.59
7	Ke	0.51	Ka	0.55	Ka	0.58
8	AP	0.47	AP	0.52	AP	0.58
9	Ra	0.46	Ra	0.51	Ra	0.50
10	MPC	0.44	Od	0.46	WB	0.50
11	WB	0.44	WB	0.46	MPC	0.49
12	Od	0.42	MPC	0.45	Od	0.48
13	UPU	0.40	UPU	0.43	UPU	0.45
14	BJ	0.37	BJ	0.35	BJ	0.38

Source: Author's calculations from EPWRF (Various Years)

In Table 4.3 we rank the states by the extent of ED undertaken by them. During the time period 1981-82 to 1990-91 only seven states had an average ED value greater than 0.5, during the next decade (1991-92 to 2000-01) nine states scored above 0.5 and during 2001-02 to 2012-13, 10 states scored ED values greater than 0.5. While Punjab and Haryana have retained the first and second position throughout the period, the extent of ED decreased during the time period 2001-02 to 2012-13 as compared to the previous decade. The states that ranked the highest on an average during 2001-02 to 2012-13 in terms of ED were Punjab (0.64), followed by Haryana (0.62), Kerala (0.60), Gujarat, Maharashtra and Tamil Nadu (0.59) (Table 4.3).

In order to understand the trend in terms of ED of the states that have scored low on this indicator they have been exhibited separately in Figure 4.2



Source: Author's calculations from EPWRF (Various Years)

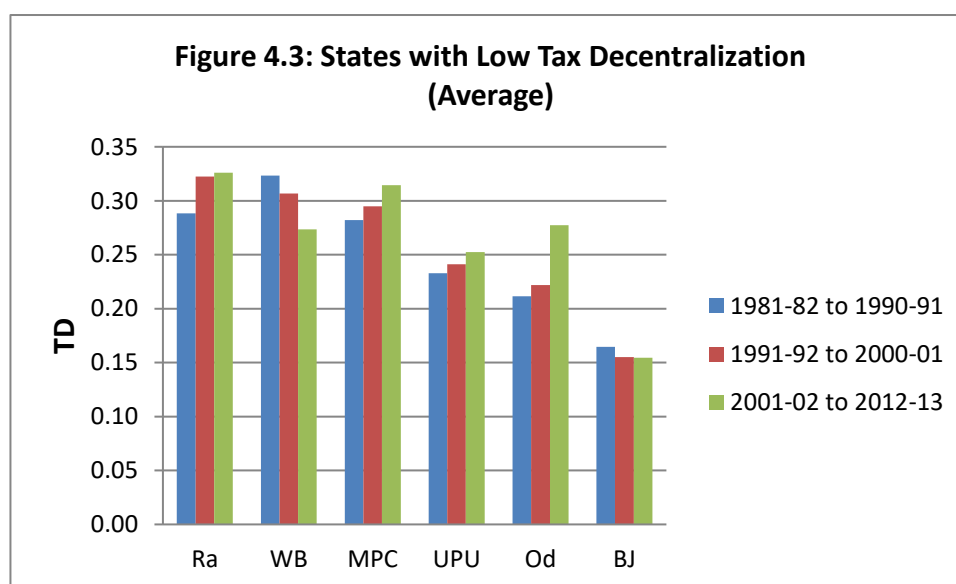
BJ is the least expenditure decentralized state and its decentralization indicator increased to only 0.38 in 2000's compared to 0.37 in the 1980's. The other states like UPU, Odisha and MPC have witnessed a continuous increase in ED.

Next we look at the trends in TD. The states which were highly decentralized in 2001-02 to 2012-13 were Haryana (0.53), followed closely by Tamil Nadu and Maharashtra (0.51) and Kerala (0.5). Punjab which ranked first during 1980's, slipped to the sixth position during 2001-02 to 2012-13. On the other hand Tamil Nadu which ranked fifth in the 1980's with a value of 0.43, climbed to second position during 2001-02 to 2012-13. Gujarat which ranked fourth in 1980's and 1990's, declined to seventh position during the 2000's (Table 4.4).

Table 4.4 Trends in Tax Decentralization, 1981-82 to 2012-13 (Average)						
Rank	States	1981-82 to 1990-91	States	1991-92 to 2000-01	States	2001-02 to 2012-13
1	Pu	0.50	Ma	0.51	Ha	0.53
2	Ma	0.48	Pu	0.50	TN	0.51
3	Ha	0.48	Ha	0.50	Ma	0.51
4	Gu	0.46	Gu	0.50	Ke	0.50
5	TN	0.43	TN	0.50	Ka	0.49
6	Ka	0.41	Ke	0.48	Pu	0.49
7	Ke	0.41	Ka	0.47	Gu	0.47
8	AP	0.38	AP	0.38	AP	0.44
9	WB	0.32	Ra	0.32	Ra	0.33
10	Ra	0.29	WB	0.31	MPC	0.31
11	MPC	0.28	MPC	0.29	Od	0.28
12	UPU	0.23	UPU	0.24	WB	0.27
13	Od	0.21	Od	0.22	UPU	0.25
14	BJ	0.16	BJ	0.15	BJ	0.15

Source: Author's compilations from EPWRF, (Various Years)

In order to understand the trend in terms of TD of the states that have scored low on this indicator they have been exhibited separately in Figure 4.3



BJ is the worst performing state and its level of TD stagnated at 0.15 during the 1990's and 2000's. Odisha which was the second last in terms of TD in the 1980's and 1990's improved drastically during the 2001-02 to 2012-13 and overtook UPU and West

Bengal (which showed a steady decline in TD). UPU and MPC have also witnessed a steady increase in TD from 1980's

We have also looked at the trends in the Autonomy indicator in Table 4.5.

Table 4.5: Trends in Autonomy Indicator, 1981-82 to 2011-12 (Average)						
Rank	State	1981-1990	State	1991-2000	State	2001-2012
1	Ma	0.86	TN	0.91	TN	0.99
2	Ha	0.83	Ma	0.87	Ma	0.85
3	Gu	0.82	Ka	0.86	Ka	0.85
4	Pu	0.82	Ke	0.85	Ha	0.85
5	Ka	0.81	Gu	0.83	Ke	0.82
6	TN	0.81	Ha	0.79	Gu	0.79
7	AP	0.80	Pu	0.77	Pu	0.76
8	Ke	0.80	AP	0.74	AP	0.76
9	WB	0.74	WB	0.68	Ra	0.65
10	MPC	0.64	MPC	0.66	MPC	0.64
11	Ra	0.63	Ra	0.64	Od	0.58
12	UPU	0.58	UPU	0.57	UPU	0.56
13	Od	0.51	Od	0.48	WB	0.55
14	BJ	0.45	BJ	0.45	BJ	0.41
Source: Compiled by author from EPWRF (Various Years)						

While Tamil Nadu had the highest rank on an average in terms of autonomy indicator during the 1990's and 2000's, Maharashtra ranked second during the same period. Punjab which ranked fourth in the 1980's slipped to seventh position in the 1990's, and 2000's. Gujarat which ranked third in terms of the autonomy indicator slipped to fifth position in the 1990's and sixth position in 2000's (Table 4.5). UPU and West Bengal also witnessed a continuous decline in autonomy over the three decades.

BJ was the only state with an autonomy indicator of less than 0.5 and the autonomy indicator declined from 0.45 in 1980's to 0.41 in 2000's.

Next we look at the how the states with high ED and TD have performed in terms of the autonomy indicator over the three decades. We look at the ranks that these states have attained in terms of ED and TD and autonomy indicator (Table 4.6). The states with high ED and TD also have a high level of autonomy (most cases). However the

ranks of these states vary for each of these indicators in most cases, for example in Table 4.5, Punjab ranked first in terms of ED and TD but ranked fourth in terms of autonomy during the 1980's. In the 1990's Punjab ranked first in terms of ED, second in terms of TD and seventh in terms of autonomy. Similarly in the 2000's Tamil Nadu ranked fifth in terms of ED, second in terms of TD and first in terms of autonomy.

Table 4.6 Rank of States having high ED and TD								
1981-82 to 1990-91			1991-92 to 2000-01			2001-02 to 2012-13		
ED	TD	Autonomy	ED	TD	Autonomy	ED	TD	Autonomy
Pu (1)	Pu (1)	Pu (4)	Pu (1)	Pu (2)	Pu (7)			
			Ha(2)	Ha (3)	Ha (4)	Ha (2)	Ha(1)	Ha(2)
			Gu (3)	Gu (3)	Gu (5)			
			Ma (4)	Ma (1)	Ma (2)	Ma (5)	Ma (2)	Ma (2)
			TN (5)	TN (3)	TN (1)	TN (5)	TN (2)	TN (1)
Source: Compiled by author based on Table 4.2, Table 4.3 and Table 4.4 Note: the value in brackets is the rank of the respective decentralization indicator.								

Similarly we look at the how the states with low ED and TD have performed in terms of the autonomy indicator over the three decades. We look at the ranks that these states have attained in terms of ED and TD and autonomy indicator (Table 4.7). The states with low ED and TD also have a lower level of autonomy. Here except for BJ the ranks of these states vary for each of these indicators, for example in the 2000's MPC ranked twelfth in terms of ED, Eleventh in terms of TD and tenth in terms of Autonomy. Similarly Odisha ranked thirteenth in terms of ED nad TD but eleventh in terms of Autonomy.

Table 4.7 Least decentralized states in terms of ED and TD								
1981-82 to 1990-91			1991-92 to 2000-01			2001-02 to 2012-13		
ED	TD	Autonomy	ED	TD	Autonomy	ED	TD	Autonomy
AP (8)	AP (8)	AP(7)						
Ra (9)	Ra (10)	Ra(11)						
MPC (10)	MPC (11)	MPC (10)	MPC (12)	MPC (11)	MPC(10)	MPC (12)	MPC (11)	MPC(10)
WB (11)	WB(9)	WB(9)	WB (11)	WB(10)	WB(9)			
Od (12)	Od(13)	Od (13)	Od (10)	Od(13)	Od(13)	Od(13)	Od(13)	Od(11)
UPU (13)	UPU (12)	UPU(12)	UPU (13)	UPU (12)	UPU(12)	UPU (12)	UPU (12)	UPU(12)
BJ (14)	BJ(14)	BJ(14)	BJ (14)	BJ(14)	BJ(14)	BJ(14)	BJ(14)	BJ(14)
Source: Compiled by author based on Table 4.2, Table 4.3 and Table 4.4								
Note: the value in brackets is the rank of the respective decentralization indicator								

Hence huge differences exist in terms of ED, TD and autonomy indicators of these 14 major states. We next study the impact of these decentralization indicators on various development indicators.

4.3 Empirical Evidence

In the next few sections we examine the impact of decentralization on various economic and development indicators. These indicators include income (GSDP), fiscal deficit, Infant Mortality Rate (IMR) and Literacy Rate (LR). In order to study the impact we use a regression model to analyse the impact of decentralization. We use all three measures of decentralization and test the null hypothesis in sequence whether they impact on these economic and development indicators.

We begin by examining the impact of decentralization on income. Our earlier discussion in Chapter 2 (section 2.5.1) suggests that fiscal decentralization could have a positive or negative impact on GSDP growth. The impact varies from country to country and depends on various structural and institutional factors. It is well understood that GSDP is subject to many influences beyond fiscal decentralization. In order to control for these influences we introduce a set of control variables to improve the robustness of the results while trying to examine the impact of decentralization. We

expect that GSDP is affected by decentralization, capital expenditure, social expenditure, administrative expenditure, liberalization and political factors.

We used the ratio of capital expenditure to total expenditure as a predictor of income. A production-function-based estimation framework has been widely used in the empirical literature on economic growth (Martinez-vazquez & McNab, 2003). A commonly used version is the Cobb-Douglas production function where output per capita depends on the capital per capita, and level of technology (Lin & Liu, 2000). Hence capital expenditure is considered to be an important variable impacting income and growth. In a study undertaken by RBI (2016), it was found that by increasing capital expenditure due to a decrease in revenue expenditure (without affecting the fiscal deficit) had a positive influence on India's economic growth. It was also found that capital expenditure had significant multiplier effects on other sectors (RBI, 2016).

We have also used social expenditure as a predictor variable. Social sector expenditures (including expenditures on education and health) are significant for India's growth and development. These expenditures enhance economic growth by positively influencing the competitiveness, productivity and efficiency of labour. Besides it has also been realised that in order to have sustainable economic growth it is a requisite to have social sustainability. We expect that social expenditures will have a positive impact on India's GSDP (Kaur et al., 2013).

We have also used administrative expenditure as an independent variable as it reflects the efficiency of administration. One of the bad practices with regard to India's sub-national finances has been the crowding out of capital and other essential expenditure inclusive of developmental, operation and maintenance expenditures by increasing revenue expenditure mainly owing to higher interest payments and wages (Lahiri, 2000). If an increasing amount of revenue expenditure is used for administrative purpose of the government then it will have a negative impact on the economy and it

will crowd out resources from more purposeful uses and it also means that the administration is ineffective. And therefore an increase in administrative expenditure is expected to have a negative impact on growth. In a study undertaken in China for local expenditures, the growth impact of spending on administration was negative and significant (Zhang & Zou, 1998).

Besides economic factors, political factors also influence India's GSDP. We have used a political variable in the form of an Alliance dummy variable in order to understand its influence on India's GSDP. This variable has previously been used by Rao & Singh (2001) and Khemani (2003).

There had been a significant change in the government's economic policy in the 1990's. We wanted to test if there is any differential impact that is attributable to other factors not included in the analysis.

We use a panel data model for the time period 1981-82 to 2012-13 for fourteen major Indian states. The specific model that we propose to analyse is stated in equation 4.4:

$$\ln Y_{it} = \beta_{0it} + \beta_1 Dec_{it} + \beta_2 X_{it} + \beta_3 Lib_{it} + \beta_3 Pol_{it} + e_{it} \quad (4.4)$$

where,

The subscript "i" is the observation unit, state; "t" is the time unit

lnY= natural log of per capita Gross State Domestic Product at current prices

Dec= measures of decentralization (3 alternate measures as stated above are tested)

X= control variables as stated below:

Capexratio: capital outlay is divided by aggregate expenditure of state "i" at current prices.

Social exp: social expenditure divided by aggregate expenditure of state "i" at current prices

Admin exp: total administrative expenditure divided by the total revenue expenditure of state "i" at current prices.

Lib: This is a dummy variable separating the post liberalization period from the pre-liberalization period. It takes the value 0 for pre liberalization years (up to 1990) and 1 after that (1991 onwards)

Pol: Alliance dummy variable which takes the value one when the government at the Centre and the state are the same or is a part of the coalition government at the Centre and zero otherwise.

e: error term

The state level year-wise population estimates are obtained by interpolating decadal Census estimates to obtain annual population for the states from 1981-82 to 2012-13. Other control variables used in similar empirical studies were value of import, exports, (Jin & Zou, 2002), growth rate of labour force, enrolment in schools (Davoodi & Zou, 1998), foreign direct investment (Jin, 2009). However state level data for these variables is not available and hence they were not included in our study.

Sources of data used in this part of the analysis are as follows:

- Data on all types of Expenditure, Fiscal Deficit and Interest Payments : (Economic and Political Weekly Research Foundation, Various Years)
- Data on GSDP: (MOSPI, Various Years)
- Data on IMR, LR: (PC, 2014)

As can be seen in the figures below, ED and TD have a positive correlation with per capita GSDP (Fig 4.5a, 4.5b).

Figure 4.5: Decentralization and log of GSDP per capita



Fig 4. 5a

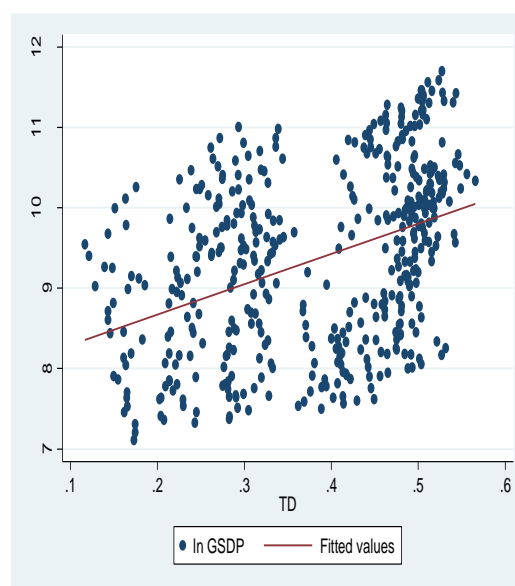


Fig 4.5b

Table 4.8: Correlation Matrix of the Independent Variables

	ED	TD	Aut	Capex	Social	Lib	Pol	Admin
ED	1							
TD	0.87*	1						
Aut	0.63*	0.9*	1					
Capex	0.04	0.1	0.04	1				
Social exp	-0.38*	-	-	0.02	1			
Lib	0.23*	0.11	-	-0.06	-0.1	1		
Pol	0.1	0.1	0.1	0.1	-0.2*	-0.14	1	
Admin	-0.33*	-	-	-0.004	-0.1	-	0.23	1

*Correlation at 1 percent level of significance

According to the correlation matrix the decentralization indicators are highly correlated with each other even though they cover different aspects of decentralization (Table 4.8). In order to avoid multicollinearity problems we have used separate regressions to understand their impact on key economic indicators. Following regressions and tests have been undertaken:

Breusch-Pagan Lagrange multiplier (LM): This test helps to decide between a random effects regression and Pooled regression.

Sargan Hansen statistic: This helps to choose between fixed or random effects with robust clustered standard errors.

Modified Wald test for group-wise heteroskedasticity in fixed effect regression model.

Wooldridge Test for autocorrelation in panel data set.

Two stage least square method to account for possible reverse causality of the dependent variable

The Breusch Pagan Lagrange Multiplier test indicated that a random effects model is preferred to a pooled regression model. Since the units of observation have not changed it is normally recommended that the fixed effects model is preferred over the random effect model. We undertake the Hausman test to confirm our choice of the fixed effects model. Since we have used the cluster robust standard errors we cannot use the standard Hausman test for post-estimation to check between fixed and random effects model. Instead of the Hausman test we use the Sargan Hansen test. The null hypothesis states that the random effects model is consistent and the alternate hypothesis states that the fixed effects model is consistent. The post estimation test rejects the null hypothesis and thus suggests that the fixed effects model is to be preferred over the random effects model as recommended. The results of the fixed effect model are presented in Table 4.9. The Adjusted R squared (overall) is around 0.6 for all the regressions. We find that the ED variable is significant at the fourth and fifth lag. This implies that decentralization may not have an immediate impact but only becomes effective after four periods. The TD indicator is significant without a lag suggesting quicker impacts. A one unit increase in TD may lead to a 5 percent increase in lnGSDP per capita. The autonomy indicator is significant at 10 percent and has a positive influence on India's GSDP. Administrative expenditure has a significant and negative impact on lnGSDP as expected. Capex ratio is significant and as expected has a positive impact on lnGSDP. The Liberalization variable is highly significant and positive confirming a higher growth in income in the

post-liberalization phase. The political alliance dummy variable has a negative coefficient but is not significant. The Modified Wald test in the fixed effects model suggests the presence of heteroskedasticity amongst the variables. Also, the correlation test shows the presence of first order autocorrelation and hence the robust clustered standard errors have been used in order to control for heteroskedasticity and first order autocorrelation. Besides this there is no bi-directional causality between economic growth and fiscal decentralization variables.

Table 4.9 : Fixed-Effects (within) Regression, Dependent Variable: lnGSDP per capita										
Variables	1	2	3	4	5	6	7	8	9	10
ED	2.41									
Lag1_ED		1.00								
Lag2_ED			1.03							
Lag3_ED				1.8						
Lag4_ED					2.28**					
Lag5_ED						2.9**				
TD							5.62**			
Lag1_TD								1.14		
Autonomy									1.47*	
Lag1_Autonomy										0.31
Capex ratio	3.47**	3.65** *	3.65***	3.47**	3.35**	3.31***	3.8***	3.7***	4.19***	3.9***
Social exp ratio	0.1***	0.05** *	0.05**	0.05**	0.05**	0.04**	0.05**	-0.05**	-0.04*	-0.04**
Lib	1.47***	1.52** *	1.53***	1.54** *	1.54** *	1.57***	1.38***	1.52** *	1.52***	1.54***
Alliance	-0.11	-0.11	-0.11	-0.13	-0.13	-0.15	-0.13	-0.12	-0.11	-0.11
Admin exp	-20.9***	-21.8** **	-21.5***	-20.5** *	-20.2** *	-19.5***	-22.9***	-22.2**	-23.7**	-8.4***
constant	6.98***	10.1** *	7.85***	6.77** *	7.1***	6.8***	8.6***	8.02** *	8.9***	8.26***
Adjusted Rsquared	within = 0.78 between = 0.14 overall = 0.64	within = 0.78 between = 0.03 overall = 0.6	within = 0.77 between = 0.04 overall = 0.6	within = 0.78 between = 0.1 overall = 0.63	within = 0.79 between = 0.13 overall = 0.65	within = 0.79 between = 0.18 overall = 0.66	within = 0.89 between = 0.69 overall = 0.72	within = 0.78 between = 0.1 overall = 0.6	within = 0.78 between = 0.12 overall = 0.6	within = 0.78 between = 0.02 overall = 0.59
F statistic F(6,13)	242.73	260.05	290.1	314.98	291.3	262.74	248.87	469.05	214.92	221.86
F statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sargan-Hansen statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Modified Wald test (P-value)	0.03	0.02	0.02	0.00	0.004	0.00	0.05	0.04	0.02	0.11
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Robust clustered standard errors (No of Obs: 448 without lags) Significance Level: ***1 percent , **5 percent, *10 percent

4.4 Fiscal Decentralization and Fiscal Deficit

We now move on to analyse the impact of decentralization on fiscal deficit of states. Gross fiscal deficit of the states is the excess of total expenditure (excluding debt repayments) of the state government over its revenue receipts and non-debt capital receipts.

Fiscal Deficit = (Total expenditure both on revenue account and capital account) – (Revenue receipts + non-debt capital receipts).

Thus, it reflects the borrowing requirement of the states to finance the expenditure to be incurred during a particular financial year. There is a large literature that suggests that a lower fiscal deficit is better for the health of the economy.

We expect that ED will have a negative and significant effect on fiscal deficit as state governments will undertake expenditure more efficiently. It will avoid wasteful expenditure as it is well acquainted with the needs of the people unlike the Central government. The Central government on the other hand will plan at the macro level and thus may undertake schemes that do not suit the states leading to wasteful expenditure. Though we expect a negative impact of ED on fiscal deficit, however empirical studies discussed earlier suggest that ED can have either positive or negative impact on fiscal deficit (Jin & Zou, 2001; Schaltegger & Feld, 2009).

Similarly we expect that greater TD will lead to a decrease in fiscal deficit because governments will be encouraged to exert greater tax effort and exploit their resources to the full potential. Their incentive would be that they can retain a greater amount of the tax instead of it being retained by the Central government. Hence they will have greater amount of revenue to cover their expenditure. Even while we expect a negative and significant impact on fiscal deficit, we should remember that some empirical studies

show that greater TD has led to higher fiscal deficit possibly due to coordination failures at the sub-national government level (De Mello, 2000).

There are a few empirical studies that show the impact of autonomy on fiscal deficit. There is general agreement that maximum efficiency in a decentralized set up requires the sub-national governments to internalize all the social benefits and costs of their policy choices (Boadway & Shah, 2007). Hence we expect a negative and significant impact of autonomy on fiscal deficit as the state governments are accountable for the way the tax money is collected and spent in the state.

There are a host of factors that impact fiscal deficit. We use a small sample of control variables in this model for our analysis. We expect that fiscal deficit is influenced by decentralization, implementation of FRBM Act, inflation, population density and growth rate.

Fiscal reforms at the state level with enactment of the FRBM Act were initiated from 2002-03. This contributed to the fiscal consolidation of the state governments. All states (except Sikkim and West Bengal) enacted the FRBM Act between September 2002 (Karnataka) and May 2007 (Jharkhand). Only West Bengal and Sikkim enacted FRBM as late as 2010 (Raut, 2011). We use the date of enactment of FRBM as a dummy variable (=1 after and 0 otherwise)

Inflation is also used as a predictor variable. Inflation is caused due to factors like increasing oil prices or bad monsoons. This puts pressure on India's import bill and leads to a rise in the general price level. The governments may undertake greater expenditure to maintain welfare measures and this can lead to an increase in fiscal deficit.

Another predictor variable used is population density. High population density puts greater pressure on natural endowments and in turn can constrain the states' economic

growth and have an adverse effect on the states' finances. Hence we expect that population density will adversely affect fiscal deficit (CoI, 2001 & PC, 2005).

We also use growth in GSDP per capita as an independent variable. A state with a sustainable increase in growth rate will be able to attract investors leading to greater employment generation and thus there will be greater income in the economy. The government may have to undertake less expenditure and we expect a significant and negative impact of growth on fiscal deficit (Iamsiraroj & Doucouliagos, 2015). According to Raut (2011) robust growth of the economy along with other major reforms of fiscal consolidation were some of the main factors that helped states in improving their finances in India.

In order to study the impact a regression model is used to analyse the impact of decentralization. We use all three measures of decentralization and test the null hypothesis in sequence whether they impact fiscal deficit in a panel data model for the time period 1981-82 to 2012-13 for fourteen major Indian states.

The regression model we propose to use is:

$$FD_{it} = \beta_{0it} + \beta_1 Dec_{it} + \beta_2 X_{it} + \beta_3 FRBM_{it} + e_{it} \quad (4.5)$$

where:

The subscript “*i*” is the observation unit, State; “*t*” is the time unit

FD: Fiscal deficit as a percentage of GSDP (at current prices)

Dec= three different measures of decentralization as stated above

X= control variables as stated below

Inflation Indicator which is the state GSDP deflator measured as the ratio of GSDP current prices divided by GSDP constant prices of individual states

Growth Rate: Growth rate of GSDP per capita at current prices

Popden : population density

FRBM: The year of implementation of the FRBM Act by states (Dummy variable)

e: error term

The Breusch and Pagan Lagrangian multiplier test confirms that the random effects model is more appropriate than a pooled OLS regression. As discussed earlier we also check for the fixed effects model. The Sargan-Hansen statistic confirms that fixed effects model is more appropriate. Interestingly, TD has no significant impact on fiscal deficit but ED is significant and has a positive impact on fiscal deficit (Table 4.10). A one unit increase in ED will have an 8.5 percent increase in fiscal deficit. Autonomy has a negative and significant impact on fiscal deficit. A one unit increase in autonomy may lead to a reduction in fiscal deficit by 4 percent. Robust clustered standard errors have been used to control for heteroskedasticity and first order auto correlation. While the population density of the state has a significant and positive influence on fiscal deficit, growth and liberalization have a significant negative impact on fiscal deficit. Inflation is not significant.

Table 4.10: Fixed-Effects (within) Regression, Dependent Variable: Fiscal Deficit									
Variables	1	2	3	5	6	7	9	10	11
ED	8.51***								
Lag1_ED		2.3							
Lag2_ED			2.3						
TD				-2.2					
Lag1_TD					-4.54				
Lag2_TD						-3.5			
Autonomy							-4.1**		
Lag1_Autonomy								-1.2	
Lag2_Autonomy									-1.2
Inflation	0.3*	0.2	0.23	0.11	0.14	0.11	0.15	0.13	0.18
Popden	0.01***	0.01***	0.01***	0.01***	0.01***	0.57***	0.01***	0.01** *	0.01***
Growth rate	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***	-0.04***	-0.05***	-0.04** *
FRBM	-2.3***	-2.3***	-2.2***	-2.2***	-2.2***	-2.2***	-2.2***	-2.2***	-2.2***
constant	-2.65*	0.13	0.1	1.94	1.6*	1.6**	4.6***	7.3***	5.28***
Adjusted R-squared	within = 0.40 between = 0.03 overall = 0.11	within = 0.35 between = 0.12 overall = 0.13	within = 0.36 between = 0.77 overall = 0.4	within = 0.35 between = 0.12 overall = 0.13	within = 0.3 between = 0.1 overall = 0.1	within = 0.38 between = 0.37 overall = 0.3	within = 0.3 between = 0.2 overall = 0.2	within = 0.45 between = 0.1 overall = 0.1	within = 0.3 between = 0.1 overall = 0.1
F statistic F (5,13)	10.83	9.76	19.56	22.32	12.33	23.46	22.34	10.54	10.54
F statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sargan-Hansen statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Modified Wald Test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Robust clustered standard errors , (No of Obs without lags: 448), Significance Level: ***1 percent , **5 percent , *10 percent									

To control for endogeneity of inflation the instrumental variable model was used. The first stage regression equations are as follows :

$$inflation_{it} = \beta_{0it} + \beta_1 Dec_{it} + \beta_2 Lag1 Inflation_{it} + \beta_3 popden_{it} + \beta_4 Growth_{it} + \beta_5 FRBM_{it} + e_{it} \quad (4.6a)$$

The IV second stage least square regression equation was the predicted value of inflation (from 4.6a) as follows:

$$FD_{it} = \beta_{0it} + \beta_1 Dec_{it} + \beta_2 predict_Inflation_{it} + \beta_3 popden_{it} + \beta_4 Growth_{it} + \beta_5 FRBM_{it} + e_{it} \quad (4.6b)$$

In the first stage regression equation, lags of the endogenous variables are used as an instrument in order to get the predicted values that are used as independent variables in the second stage regression (Table 4.11). ED has a significant and positive effect on FD (Table 4.12). TD is not significant. Autonomy is highly significant and has a negative impact on FD. Inflation is not significant in all three regressions. The results confirm that the FRBM Act has had a significant and negative impact on FD. While growth rate has a significant and negative influence on FD, population density has a significant and positive influence on FD. The Kleibergen-Paap rk Wald F statistic is greater than the Stock-Yogo weak ID test critical values at 10% maximal IV size indicating that the instruments are not weakly identified. (Table 4.12)

Table 4.11: First Stage Fixed Effects Regression, Dependent Variable: Inflation			
	1	2	3
Lag1_inflation	-0.63***	.65***	0.66***
Popden	-0.0002***	-0.0003	.001
FRBM	.1***	.01***	.002
Growth rate	0.002	.001	.003
ED	-2.18***		
TD		-2.49**	
Autonomy			-.218
F test of excluded instruments	F(1, 428) = 50.30 Prob > F = 0.00	F(1, 428) = 60.10 Prob > F = 0.00	F(1, 428) = 61.25 Prob > F = 0.00
Sanderson-Windmeijer (SW) F test of weak identification	SW F(1, 428) 50.30	SW F(1, 428) 60.10	SW F(1, 428) 61.25
Weak identification test (Stock-Yogo) critical values: 10%	16.38	16.38	16.38
Sanderson-Windmeijer (SW) first-stage chi-squared test of underidentification	SW Chi-sq(1)50.89 (P-value)= 0.00	SW Chi-sq(1) 60.80 (P-value)= 0.00	SW Chi-sq(1) 61.96 (P-value)= 0.00
Robust clustered standard errors, No of obs 428, Equation exactly identified.			

Table 4.12: IV (2SLS) Estimation Dependent Variable, Fiscal Deficit			
	1	2	3
Inflation	-0.02	-0.2	-0.1
Popden	0.01***	0.01***	0.1***
FRBM	-2.3***	-2.2***	-2.1***
Growth rate	-.039***	-0.04***	-0.04***
ED	7.25***		
TD		-2.54	
Autonomy			-4.02***
Centered R Squared	0.367	0.34	0.36
F statistic: Kleibergen-Paap rk Wald	284	315.4	25
Weak identification test (Stock-Yogo) critical values: 10%	16.38	16.38	16.38
Kleibergen-Paap rk Under-identification Test (P- value)	0.00	0.00	0.00
Endogeneity test of endogenous regressors: Chi-sq(2) (P-value)	0.04	0.04	0.08
Instrumented Variables:	inflation	inflation	inflation
Excluded instruments	Lag1_Inflation	Lag1_Inflation	Lag1_Inflation
Robust clustered standard errors, No of obs 434, Equation exactly identified. Significance Level: ***1 percent , **5 percent, *10 percent			

4.5 Fiscal Decentralization and Outcomes

4.5.1 Fiscal decentralization and Infant Mortality Rate

We now look at the infant mortality rate (IMR) as a health indicator often used in literature. We examine the impact of fiscal decentralization on IMR which is defined as the number of deaths of infants to 1000 live births per year.

Health care reformists have argued that decentralization is an effective mechanism to improve the provision of public goods like health care services. Devolving more powers to local governments is expected to enhance health delivery (Arun & Ribot, 1999; Besley & Burgess, 2001; Mill, 1994; Peabody et al., 1999; Robalin et al., 2001). The causes of infant mortality may differ from state to state and hence they need to design specific programmes depending on local needs. We expect TD to have a negative

impact on IMR as TD results in the sub-national governments having greater resources to cater to local health needs. Greater autonomy also leads to a decrease in IMR because the authorities are accountable directly to the people for the outcome of the expenditure that is undertaken and thus will avoid wasteful expenditure. Besides decentralization, we expect that IMR is also influenced by economic growth rate, liberalization and socio-economic expenditure and Central schemes .

Growth rate is used as an explanatory variable because a larger income will allow people to access better health care. It will also enable them to have access to better nutrition and education which will also reduce IMR.

Medical, educational and sanitation expenditures of the government come under the heading of social expenditure. An increase in the social expenditure is expected to have a negative impact on IMR (Asfaw et. al., 2007).

Liberalization is expected to positively impact growth in income and better health technology and thereby reduce IMR.

Central schemes: There are various Centrally Sponsored schemes and Central Plan schemes in the area of health which the Centre undertakes for primary, secondary and tertiary level of India's health sector. We could not separate the expenditure under the central schemes exclusively for health and hence this variable is the aggregate expenditure for the respective states under the heading of Central schemes.

We use a regression model to analyse the impact of decentralization and test the null hypothesis whether there is any impact on IMR. We use a panel data model for the time period 1981-82 to 2012-13.

The specific model that we test is:

$$IMR_{it} = \beta_{0it} + \beta_1 Dec_{it} + \beta_2 X_{it} + \beta_3 Lib_{it} + e_{it} \quad (4.7)$$

where,

The subscript “*i*” is the observation unit, state; “*t*” is the time unit

IMR_{it}= Infant Mortality Rate

Dec_{it}= three different measures of decentralization are used (as discussed earlier).

X_{it} represents control variables as follows:

Growth rate: Growth rate of GSDP per capita at current prices.

Social expenditure (socexp) = Ratio of social expenditure divided by aggregate expenditure at current prices.

Central schemes: Centrally sponsored schemes and Central Plan schemes in per capita terms.

Lib: this is a dummy variable that takes the value 0 for 1990 and before and 1 for 1991 and afterwards.

e: error term

Again the Breusch and Pagan Lagrangian multiplier test indicated that the random effects model is more appropriate than a pooled OLS regression. Again, since we are dealing with units that are not changing over time, we test the feasibility of using the fixed effects model. The Sargan Hansen statistic confirms that the fixed effects model is preferred to a random effects model (Table 4.13). Contradictory to what we had expected all the decentralization variables are not significant. On the other hand all the control variables used that is social expenditure, central schemes, liberalization dummy and growth rate are highly significant and have a negative influence on IMR.

Table 4.13: Fixed Effects (within) Regression, Dependent Variable: IMR									
Variables	1	2	3	4	5	6	7	8	9
ED	-35.12								
Lag1_ED		14.56							
Lag2_ED			9.81						
TD				-34					
Lag1_TD					11.5				
Lag_2TD						23			
Autonomy							-11.98		
Lag1_Autonomy								0.05	
Lag2_Autonomy									13.32
Social exp ratio	-0.87** *	-0.71** *	-0.73** *	-0.76** *	-0.73** *	-0.7***	-0.71** *	-0.76** *	-0.74** **
Liberalization	31.8** *	33.4** *	-33***	31.8** *	33.3** *	29.9** *	32.9** *	-33***	-33***
Growth rate	-0.3***	0.27** *	0.28** *	0.30** *	0.27** *	-0.3***	0.27** *	0.29** *	0.28** **
Central schemes	-0.12**	0.12**	0.12**	0.12**	0.15**	-0.02*	0.12**	0.12**	0.12** *
Constant	138.9** **	109** *	112***	135** *	113** *	108** *	123** *	119** *	108** *
F statistic F(5,13)	25.65	23.53	22.89	27.75	22.7	23.9	23.89	22.9	22.78
F statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sargen Hansen Statistic(P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Modified Wald test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjusted R Squared	within = 0.63 between = 0.30 overall = 0.38	within = 0.62 between = 0.01 overall = 0.27	within = 0.62 between = 0.001 overall = 0.28	within = 0.61 between = 0.41 overall = 0.42	within = 0.62 between = 0.03 overall = 0.26	within = 0.63 between = 0.11 overall = 0.23	within = 0.62 between = 0.2 overall = 0.4	within = 0.62 between = 0.01 overall = 0.3	within = 0.63 between = 0.1 overall = 0.3
Robust clustered standard errors , No of Obs without lags: 448 Significance Level: ***1 percent , **5 percent, *10 percent									

We tested for endogeneity between IMR and decentralization indicators as well as social expenditure and found that there is no bi-directional causality between IMR and the independent variables.

4.5.2 Fiscal decentralization and Literacy Rate (LR)

Lastly, we look at the influence of decentralization on an important outcome indicator in the field of education which is the literacy rate. Decentralization has been found to improve performance on outcome indicators not only in the area of health but also in education (Lindaman & Thurmaier, 2002). Various studies conducted by the World Bank have also suggested that public goods and services should be provided by the lowest level of government in such a way that they can fully bear the costs and benefits (World Bank, 1997, 2004). Decentralization of public education has been found to increase student achievement (Falch & Fisher, 2012; Galiani & Schargrotsky, 2002). On the other hand, Merrouche (2007) found that decentralization of education expenditure in Spain did not affect the LR.

As in the case of IMR we expect that LR are influenced by decentralization, growth rate, liberalization and socio-economic expenditure.

Growth rate is used as an explanatory variable because a larger income will allow people to avail education. Besides this larger incomes will also reduce the incidence of child labour and increase the enrolment into schools in the long run (Abdullahi & Noor, 2015).

Medical, educational and sanitation expenditures of the government come under the heading of social expenditure. Just like in the area of health, outcomes in education as well are enhanced by greater social expenditure (Rubin et.al., 2016).

Central schemes: There are a number of Central sector schemes and Centrally sponsored schemes at the school as well as at the higher education level that are being implemented by the Centre in various states India. We could not separate the expenditure under the central schemes exclusively for education and hence this variable is the aggregate expenditure for the respective states under the heading of Central schemes.

As was done earlier we use a regression model to analyse the impact of decentralization. We use all three measures of decentralization and test the null hypothesis in sequence whether they impact LR. We use a panel data model for the time period 1981-82 to 2012-13.

The specific model that we test is:

$$LR_{it} = \beta_{0it} + \beta_1 Dec_{it} + \beta_2 X_{it} + \beta_3 Lib_{it} + e_{it} \quad (4.8)$$

where,

The subscript “*i*” is the observation unit, state; “*t*” is the time unit

LR_{it} = Literacy Rate

Dec_{it}= three different measures of decentralization as stated above.

X_{it} represents control variables as follows:

Growth Rate: Growth rate of GSDP per capita current prices.

Social Expenditure (socexp) = Social expenditure divided by aggregate expenditure at current prices.

Central schemes: Centrally sponsored schemes and Central Plan schemes in per capita terms.

Lib: this is a dummy variable that takes the value 0 for 1990 and before and 1 for 1991 and afterwards.

e: error term

As in the earlier regressions, Breusch and Pagan Lagrangian multiplier test and the Sargan Hansen statistic confirm that the fixed effects model is more appropriate (Table 4.14). In this model only ED has a significant and positive impact on LR only at the third and fourth lag. TD and autonomy are not significant. As expected liberalization and social expenditure ratio have a significant and positive impact on literacy rates. We used the second lag of the Centrally sponsored schemes and Central Plan schemes in

order to account for the problem of multicollinearity between the independent variables.

The Central schemes have a significant and positive influence on LR.

We tested for endogeneity between literacy rate and decentralization indicators as well as social expenditure ratio and found that there is no bi-directional causality between them.

Table 4.13: Fixed Effects (within) Regression, Dependent Variable: Literacy Rate							
Variables	1					2	3
ED	33.2						
ED_Lag1		11.03					
ED_Lag2			11.03				
ED_Lag3				24.9**			
ED_Lag4					26.03**		
TD						30.59	
Autonomy							3.3
Central schemes_Lag2	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***	0.01***
socexppc ratio	0.43**	0.35**	0.34**	0.37**	0.36**	0.32*	0.3*
Liberalization	16.01***	17.02***	16.9***	16.9***	17.1**	16.6***	17.2***
Growth rate	0.1**	0.1*	0.1**	0.1**	0.1**	0.1*	0.6*
Constant	17.57	30.9***	27.3***	23.26***	22.9***	28.5**	35.4***
Sargen Hansen Statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjusted R-Squared	within = 0.69 between = 0.37 overall = 0.46	within = 0.69 between = 0.19 overall = 0.38	within = 0.69 between = 0.26 overall = 0.4	within = 0.7 between = 0.3 overall = 0.43	within = 0.7 between = 0.26 overall = 0.42	within = 0.67 between = 0.42 overall = 0.51	within = 0.69 between = 0.1 overall = 0.37
F statistic F(5,13)	91.81	84.78	81.73	82.48	84.17	78.77	92.15
F statistic (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Modified Wald Test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Robust Cluster Standard Errors , No of Obs without lags: 447 Significance Level: ***1 percent , **5 percent , *10 percent							

4.6 Conclusion

Our findings in this chapter suggest that ED (with a lag), TD and Autonomy have a positive and significant impact on GSDP per capita. It is reasonable to anticipate that the effects of the expenditure undertaken may show results after some lag. Hence it will be growth enhancing if the states undertake more of the expenditure responsibilities and raise more own tax revenue. Sub-national governments are better aware of the local needs and thus are in a better position to match local demand with the available resources. The results also reveal that the sub-national governments should reduce their administrative expenditure as it leads to a negative impact on GSDP and they should invest their resources in capital expenditure and social expenditure. Central governments should focus more on providing those public goods and services that have economies of scale and spill-over effects across states. Thus without having to increase the total expenditure and by only shifting the expenditure responsibilities across levels of governments can lead to more efficient allocation of resources and positively contribute to the GSDP.

ED seems to cause an increase in fiscal deficit but autonomy was found to have a negative impact on fiscal deficit. Greater autonomy makes the authorities more accountable to the tax payers and hence it has a negative impact on fiscal deficit as the authorities use the money raised by them more efficiently. Hence increased ED should be accompanied by greater autonomy. ED is growth enhancing but also increases the fiscal deficit. Greater autonomy could help to keep a check on the growth of fiscal deficit.

None of decentralization indicators seem to have any impact on reducing IMR. Similarly while ED has a significant and positive impact on LR, TD and autonomy do not have a significant impact.

The three different indicators of decentralization have different impacts on the economic and development indicators. However all three of them are equally important in order to reap the full benefits of decentralization and minimize the negative impacts which may occur due to greater fiscal decentralization.

We now turn to chapter five. We try to analyse the impact of inter-governmental transfers on state tax effort and fiscal deficit as well as to find out if political lobbying affects the distribution of transfers to states in the next chapter.

Chapter 5

Inter-governmental Transfers amongst Non-Special Category

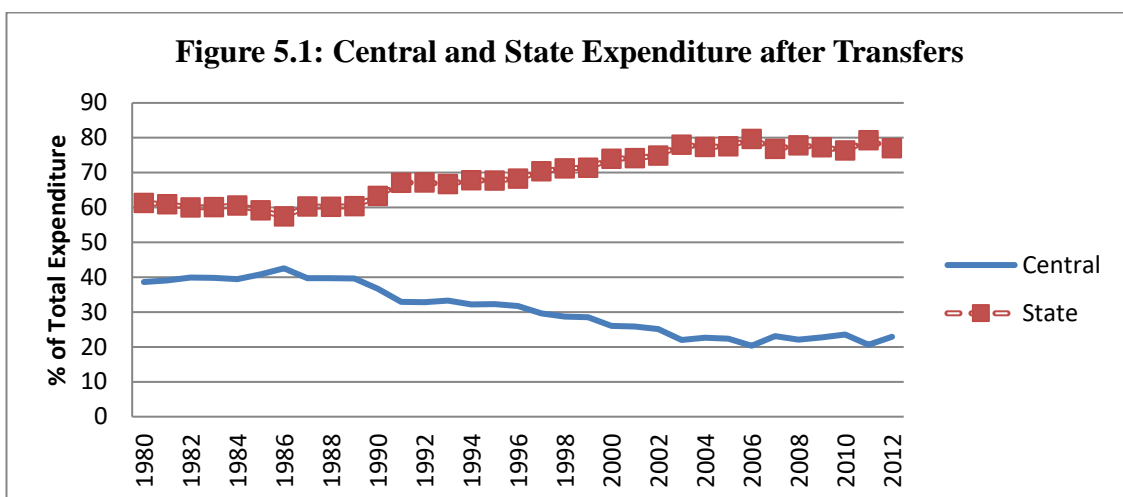
States in India

5.1 Introduction

Equalization can be seen as a natural complement to decentralization as it aims at correcting potential imbalances which arise due to revenue or expenditure decentralization. In India vertical and horizontal imbalances are inevitable due to the revenue and expenditure assignments across Central, state and local governments backed by the Constitution and due to the differing fiscal capacities and expenditure needs across states. While the Centre is given the authority to collect major part of the revenue resources, the states are assigned a greater part of the expenditures. Hence inter-governmental transfers have become an important part of India's fiscal system to narrow the gap between the expenditure and revenue responsibilities of sub-national and local governments.

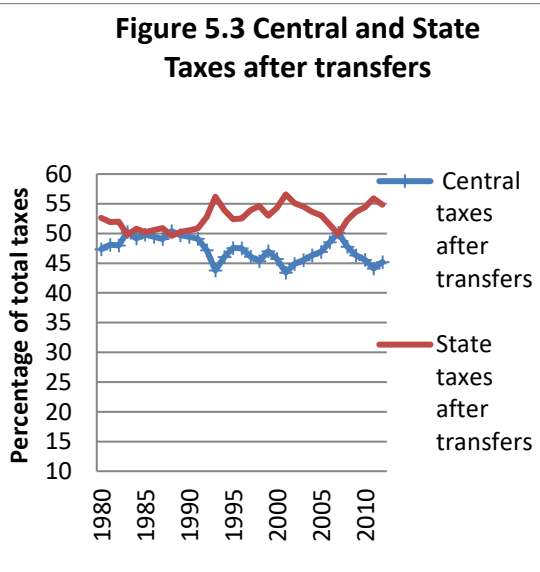
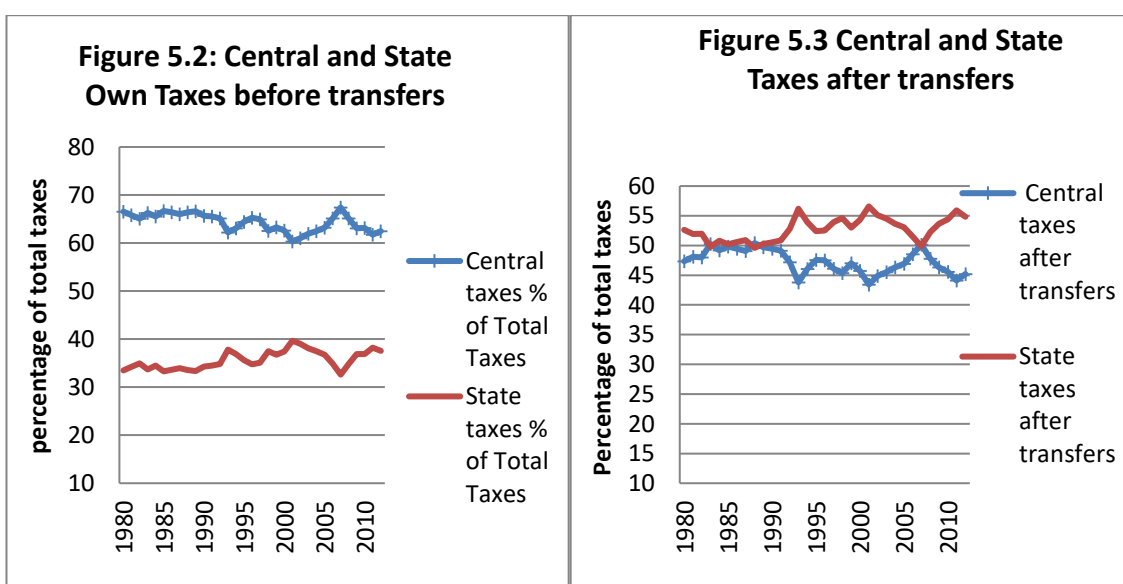
India comprises of states with varied linguistic, cultural, geographical, demographic and natural resources. Even in terms of the political scenario there are various political parties across the states each with a different programme for social and economic development. All these factors make the task of the disbursement of inter-governmental transfers to states even more intricate.

In this chapter we try to find out whether inter-governmental transfers have had an equalizing impact on state expenditure. We also try to find out whether there is a trade-off between inter-governmental transfers and fiscal deficit and whether these transfers have been subject to political bargaining. Finally, we examine the impact of inter-governmental transfers on tax effort of states.



Source: (GoI, 2013)

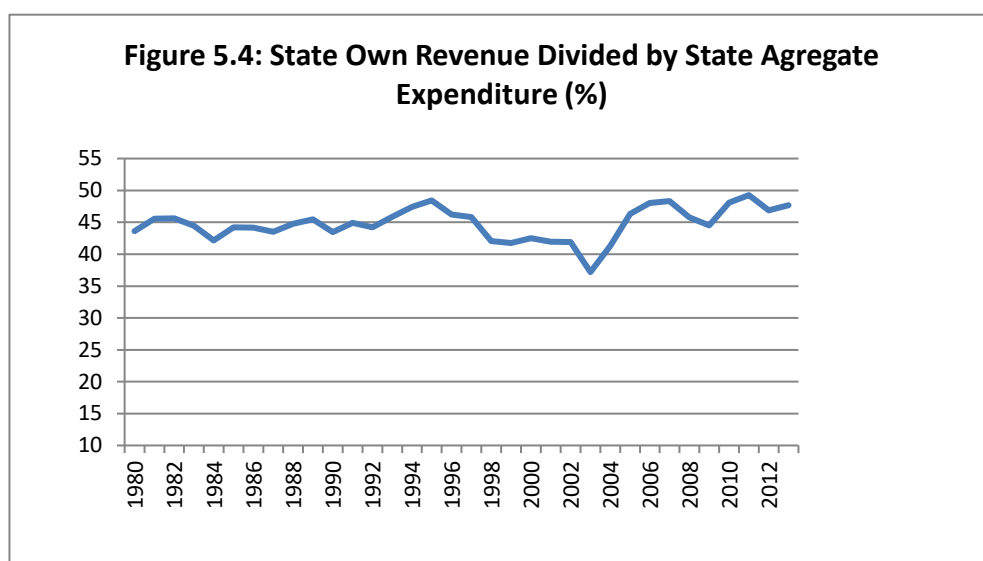
As can be seen from Figure 5.1, state governments incurred major part of the total expenditure (69 percent) on average from 1980-81 to 2012-13 while the Centre incurred a smaller proportion (31 percent). The expenditure responsibilities for the states have continued to increase since the mid 1980's.



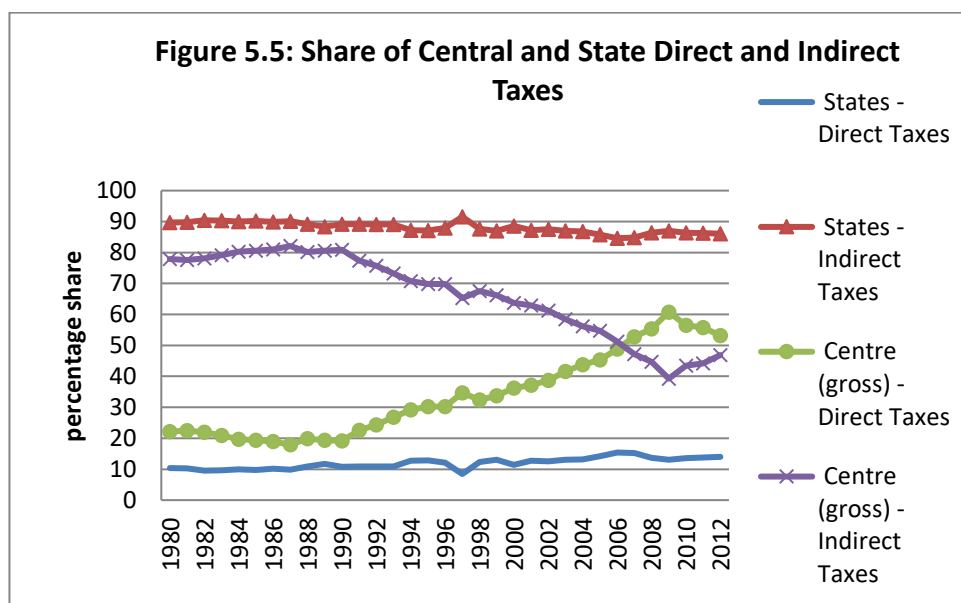
Source: (RBI, 2014)

In spite of the ever increasing expenditure responsibilities being devolved to the states there is very little tax decentralization being undertaken in India. States collect on an average around 36 percent of the total taxes and Centre collects around 64 percent on an average. The situation did not change much even after liberalization in 1991(Figure 5.2).

After the transfer of the share in Central taxes to the states by the Centre, the states had around 54 percent of the total tax revenues and the Centre around 46 percent on average (Figure 5.3). In fact in India, states are able to cover only close to 50 percent of their expenditure through state own tax and non-tax revenue resources (Figure 5.4). Hence states still are highly dependent on transfers and borrowings from the Central government and market.



Source: EPWRF (Various Years)



Source: (RBI, 2014)

The direct taxes over took the indirect taxes as the major component of tax revenue of the Centre in 2006-07 (Figure 5.5). For the states the share of direct taxes is less than 20

percent in their own total taxes. There has been a marginal increase in this over the years.

We now discuss the concept of tax buoyancy in the context of tax revenue in India. Buoyancy measures the responsiveness (elasticity) of the tax due to the change in the tax base. It is measured by the OLS coefficients estimated using a log/log model with natural log tax treated as a function of natural log GDP/GSDP (for the central as well as state government). As is done in literature GDP/GSDP is taken as a proxy for tax base. If “T” represents a time-series of tax collections and “X” is the tax base, then regressions takes the form $\ln T = \beta_0 + \beta_1 \ln B + e$ where “e” is the error term. We estimate β_1 , which is the tax buoyancy. It is the average percentage change in tax revenue (T) for a one percent change in the tax base (X) (GoI, 2004). Our results suggest that the buoyancy of both state and Central tax revenues has decreased in the 1990’s and 2000s’ as compared to 1980s’ (pre-liberalization) (see table 5.1).

Table 5.1: Buoyancy of Central and State Tax Revenue				
1981-82 to 1990-91				
	lnState Taxes		lnCentral Taxes	
	Coefficient	R Square	Coefficient	R Square
lnGSDP at factor cost, current prices	1.13***	0.99	1.14***	0.99
No. of observations:10				
1991-92 to 2000-01				
lnGSDP at factor cost, current prices	0.95***	0.99	0.86***	0.98
No. of observations:10				
2001-0 to 2012-13				
lnGSDP at factor cost, current prices	1.06***	0.99	1.10***	0.96
No. of observations :12				
Source: Author’s compilations from RBI (2014)				

The buoyancy of state tax revenue was 1.13 in the 1980's which declined to 0.95 in 1990's and then increased to 1.06 in 2000s' but still remained below the level in the 1980s'. The buoyancy of the Central tax revenue was 1.14 in 1980s' decreased to 0.98 in the 1990's and then increased to 1.10. The decrease in the buoyancy of Central taxes in the 1990's occurred despite a significant increase in the growth rate of direct taxes, as during this period the importance of two major indirect taxes that is Customs and Union excises decreased to a great extent (FC, 2000).

Tax reform undertaken in 1991, brought some rationality in the tax structure. However, it had a negative impact on the Centre's revenue, as the growth of direct taxes could not fully make-up for the decrease in customs and union excise revenues. On the other hand, during the 1990's the decrease in state own tax buoyancy occurred as revenue from sales tax, which is the main component of states' own tax sources witnessed a declining growth trend due to tax competition among the states. There was a competitive lowering of sales tax and other concessions to attract trade and industry by the states. Further, there was also tax exportation. This meant that taxation by a state had its actual incidence on citizens of other states, for example through tax on inter-state sales (FC, 2000).

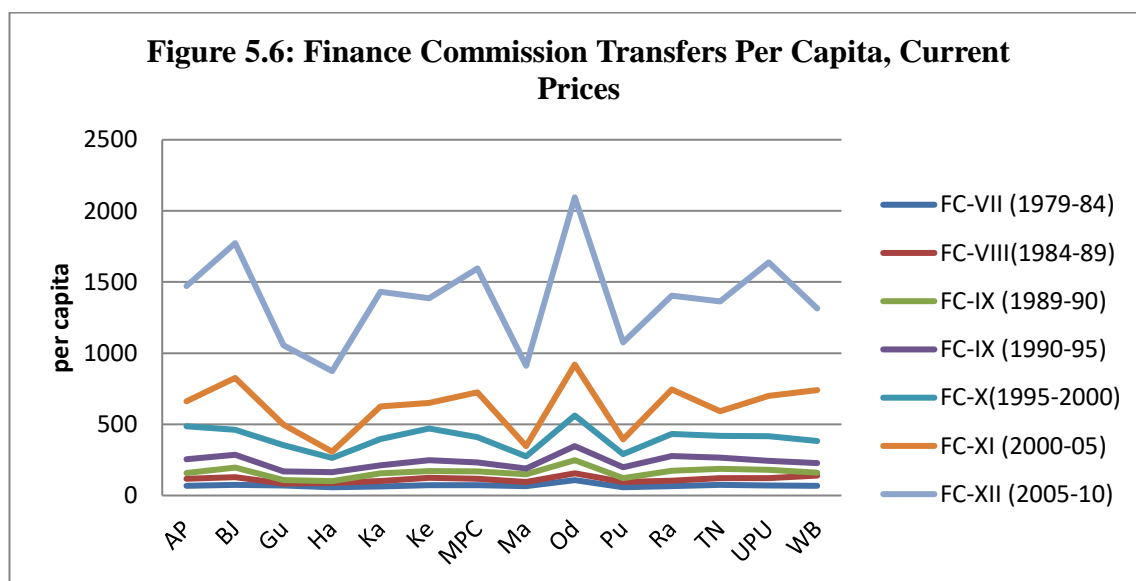
Since transfers comprise of a major part of the state revenue we look at the trends in transfers below.

Table 5.2: Central Transfers to States: Growth and Share				
Year (Average)	Total transfers from the Centre (Rs. Crore)	PC transfers as a percent of the total transfers	FC transfers as a percent of total transfers	Total central loans as a percent of total transfers
1981-82 to 1990-91	15418	34	58	34
1991-92 to 2000-01	55851	29	63	29
2001-02 to 2012-13	249317	30	60	8
Total transfers = Finance Commission + State Plan schemes + Central Plan schemes + Centrally sponsored schemes + other discretionary transfers.				
Source: (EPWRF, Various Years)				

Evidently, FC transfers comprised of the major portion of the Central transfers to the states (Table 5.2). The PC transfers comprised around 30 percent of the total transfers which was also a sizeable amount. The amount of loans as a percentage of the total transfers decreased drastically from 34 percent in 1980's to 8 percent in 2000's indicating that states are increasingly market-dependent for loans at higher interest rates. The decline in the Central loans are a consequence of the recommendations of the Twelfth FC, which suggested that the Central government should not intermediate borrowings of state governments from 2005-06 onwards. This resulted in a sharp decline in the flow of loans from the Centre thereafter. Hence from 2007-08 onwards, state governments have increasingly resorted to market borrowings in the form of State Development Loans. In fact, loans from the National Small Savings Fund (NSSF) formed a sizeable portion of funding between 2003-04 and 2006-07 for states, declining greatly after that (Ghosh et al., 2012).

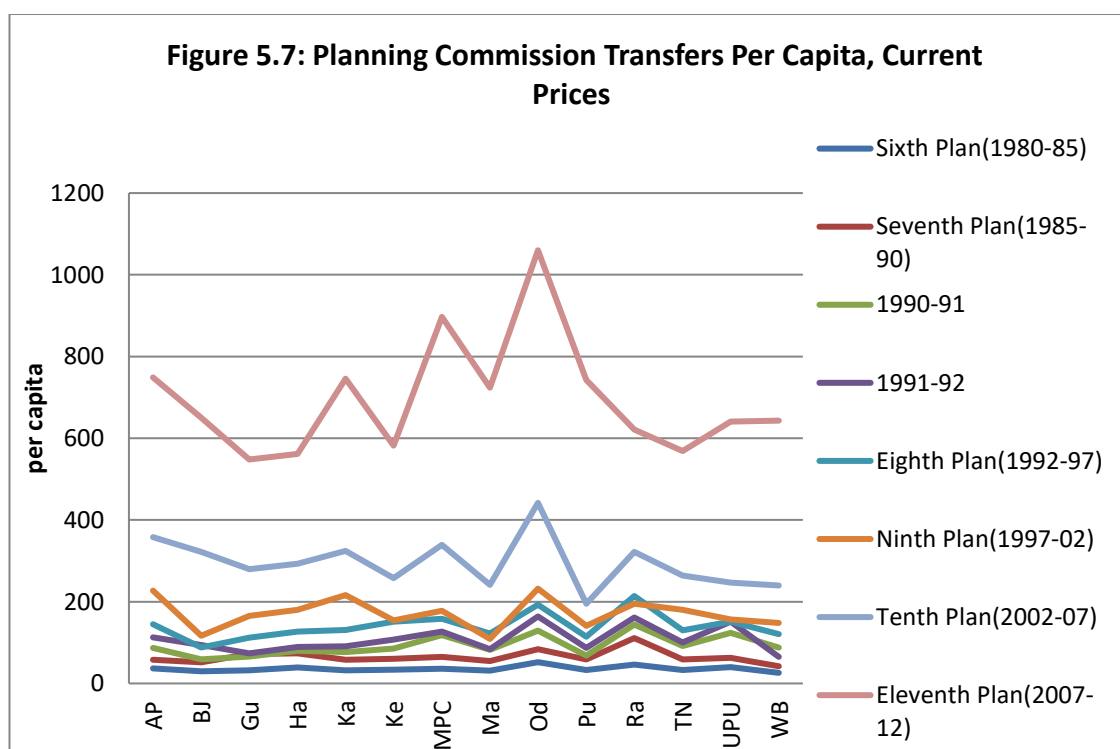
The devolution of total transfers to the 14 non-special category states from the FC and PC in per capita terms are presented in Figure 5.6 and Figure 5.7. Since this study covers the time period from 1981-82 to 2012-13, the five year plans that fall within this time period have been considered for the analysis. The FC transfers comprise of the statutory transfers of states' share in Central taxes as well as statutory non plan grants to states. The PC transfers on the other hand comprise of state and Central plan schemes, Schemes sponsored by the Centre and other discretionary transfers. The transfers that are determined through formulas to the states are the state's share in Central taxes and state plan schemes. The states included in the study are Andhra Pradesh (AP), Bihar and Jharkhand together (BJ), Gujarat (Gu), Haryana (Ha), Karnataka (Ka) Kerala (Ke), Madhya Pradesh and Chattisgarh (MPC), Maharashtra (Ma), Odisha (Od), Punjab (Pu),

Rajasthan (Ra), Tamil Nadu (TN), Uttar Pradesh and Uttarakhand (UPU) and West Bengal (WB).



Source: Author's compilation from EPWRF (Various Years)

Odisha received the highest amount of transfers from the FC over the years during the period of the study covered (that is from the Seventh Plan onwards). Up to the Twelfth FC, Haryana received the least amount of transfers in per capita terms from the FC.



Source: Author's compilation from EPWRF (Various Years)

Evidently, the situation has been different with respect to the PC transfers. In the Sixth Plan, Odisha got the highest transfers and West Bengal got the least. Bihar received lower transfers than Gujarat, Haryana and Maharashtra. In the Seventh Plan, West Bengal received the lowest transfers and Rajasthan received the highest. In the Eight Five year Plan, Rajasthan again topped the list while Bihar received the least transfers. In the Ninth, Tenth and Eleventh Plan, Odisha received the highest transfers. The states which received the lowest transfers were Maharashtra, West Bengal and Gujarat respectively. Hence the distribution of transfers from the PC vary more than that of the FC. For the PC sometimes the states which received the least transfers per capita were also states that had the lowest per capita income. On the other hand the states which received the least transfers from the FC were also the states with high per capita income. When the author combined all transfers (PC+ FC) and measured the total transfers, the states which received the highest transfers in the 1980's were Odisha, Rajasthan , UPU and Kerala and the states which received the least transfers were Gujarat, Punjab , Haryana and Maharashtra. In the 1990's the states which received the highest transfers were Odisha, Rajasthan, Andhra Pradesh and Kerala and the states which received the least transfers were Maharashtra, Punjab , Haryana and Gujarat. In the 2000's, Odisha received the highest per capita followed by BJ, MPC and UPU (Table 5.3). The state with least total per capita transfers was Maharashtra followed Haryana, Gujarat and Punjab. Hence in totality the transfers seem to be equalizing in terms of distribution of transfers to states. As the states with the lowest per capita income receive more transfers and the states with the highest per capita incomes receive lowest amount of total transfers from the Centre.

Table 5.3 : Average Total Transfers (PC+ FC) Per Capita (Rupees), Current Prices						
Ran k	States	1981- 82 to 1990-91	States	1991-92 to 2000-01	States	2001-02 to 2012-13
1	Od	242	Od	714	Od	2846
2	Ra	202	Ra	610	BJ	2309
3	UPU	180	AP	569	MPC	2289
4	Ke	176	Ke	534	UPU	2112
5	MPC	175	MPC	534	AP	2066
6	TN	175	TN	518	Ka	1996
7	BJ	173	UPU	512	Ra	1951
8	AP	170	BJ	508	WB	1891
9	WB	166	Ka	495	Ke	1786
10	Ka	151	WB	489	TN	1721
11	Ma	146	Gu	425	Pu	1527
12	Ha	145	Pu	399	Gu	1450
13	Pu	142	Ha	368	Ha	1390
14	Gu	137	Ma	363	Ma	1372

Source: (EPWRF, Various Years)

We wish to examine if the transfers have actually had an equalizing effect. We start by plotting the Intotal transfers (FC+PC) against Inpercapita income (GSDP) for each decade (Figures 5.8, 5.9 and 5.10). This is a commonly used method to understand whether the transfers are equalizing in terms of distribution (GoI, 2014; Rao, 2000; Rao & Singh, 2001). We find that the line of best fit is downward sloping in all three periods. In order to confirm that the slope coefficient is significant we run a two variable OLS regression of total transfers per capita against per capita income. The results suggest that the natural log of income has a significant and negative coefficient with respect to transfers. This implies that total transfers have been devolved in an equitable manner across the states. High income states received lower transfers and the low income states received higher transfers. Over the years this relationship has just been strengthened as the absolute value of coefficient has increased over time.

Figure 5.8: Relation between ln Total Transfers pc and ln GSDP pc, 1981-82 to 1990-91

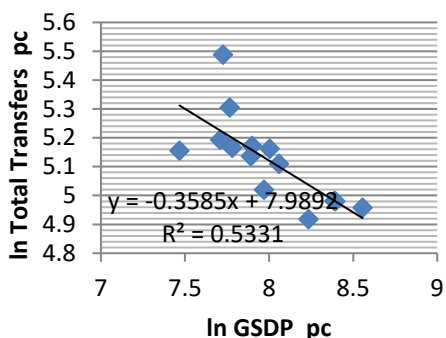


Figure 5.9 Relation between ln Total Transfers pc and ln GSDP pc, 1991-92 to 2000-01

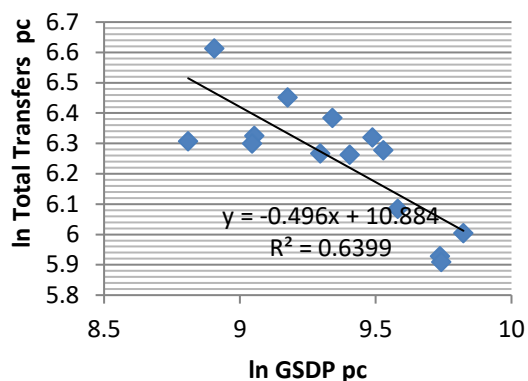
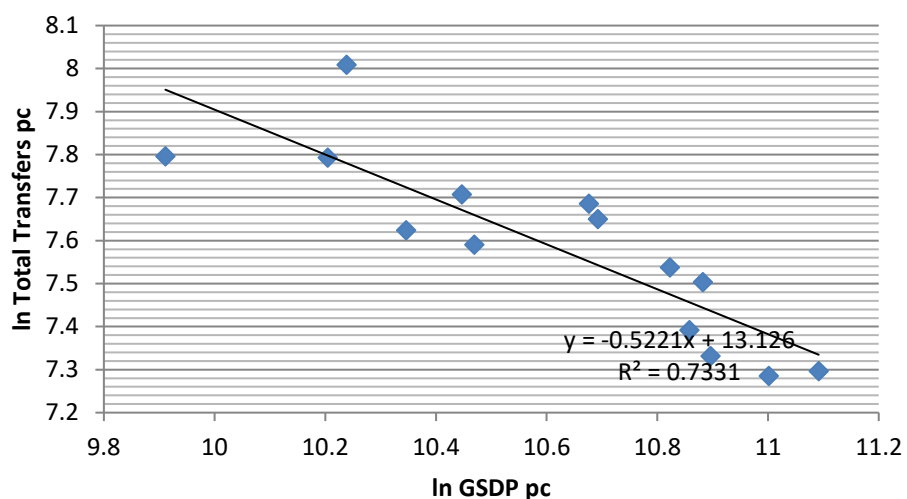


Fig 5.10: Relation between ln Total Transfers pc and ln GSDP pc, 2001-02 to 2012-13



In order to understand the equalizing impact of transfers from the FC and PC separately, we ran individual regressions for each plan period (Table 5.4 and Table 5.5). The natural log of GSDP per capita was regressed on natural log of FC transfers per capita and PC transfers per capita respectively. FC transfers are found to have an equalizing effect as the coefficient of natural log of GSDP is negative and significant. The Eleventh FC seems to be most effective since a one percent decrease in GSDP of a state leads to a 0.79 percent increase in transfers for the state (Table 5.4).

Table 5.4: Relation between FC transfers and GSDP, Dependent variable: lnFC Transfers Per Capita				
	Independent Variable: ln GSDP per capita			
FC (Average years)	Coefficient	R-square	F (P-value)	No. of observations
FC-VII (1979-84)	-0.26**	0.23	0.00	14
FC-VIII(1984-89)	-0.39**	0.38	0.01	14
FC-IX (1989-90)	-0.55***	0.55	0.00	14
FC-IX (1990-95)	-0.49***	0.6	0.00	14
FC-X(1995-00)	-0.48***	0.5	0.00	14
FC-XI (2000-05)	-0.79***	0.66	0.00	14
FC-XII (2005-10)	-0.48***	0.6	0.00	14
FC –XIII (2010-13)	-0.02***	0.72	0.00	14
Source : (EPWRF, Various Years; MOSPI, Various Years)				

In terms of PC transfers even though lnGSDP per capita has a negative sign, however it is not significant (Table 5.5). These findings are similar to Sato (1992) who found that transfers distributed through the FC proved to be significantly redistributive but the plan transfers showed poor redistributive effect. In some years, the plan transfers were greater to high-income states rather than low-income states which defeats the equalizing objective of these transfers.

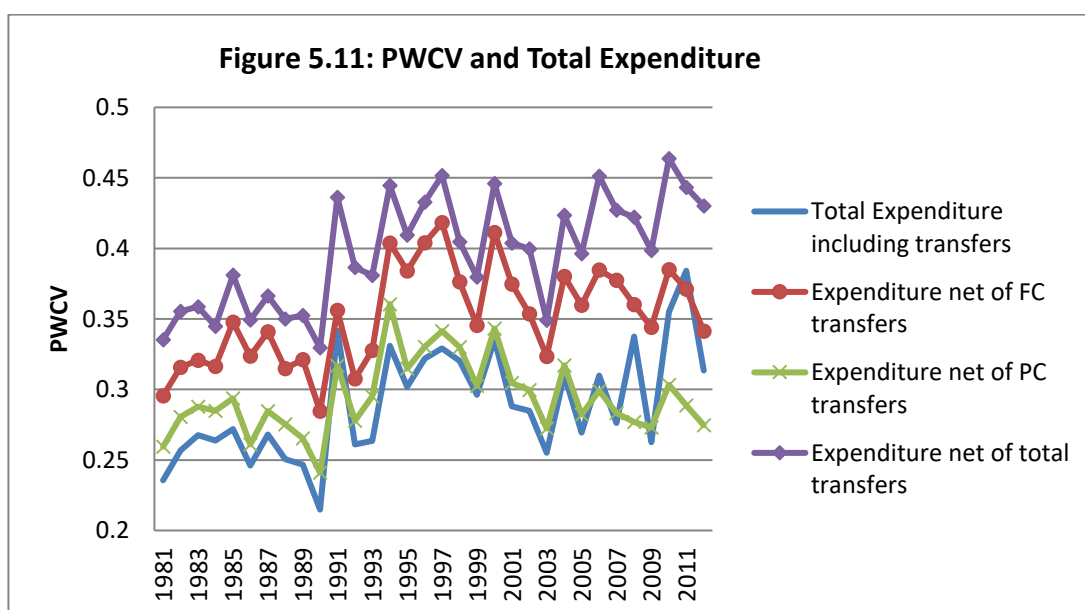
Table 5.5: Relation between PC Transfers and GSDP, Dependent Variable: lnPC Transfers Per Capita				
	Independent Variable: lnGSDP per capita			
PC (Average years)	Coefficient	R squared	F (P-value)	No. of observations
Sixth Plan(1980-85)	-0.17	0.01	0.31	14
Seventh Plan(1985-90)	-0.11	0.02	0.11	14
Eighth Plan(1992-97)	-0.14	0.05	0.98	14
Ninth Plan(1997-02)	-0.12	0.03	0.54	14
Tenth Plan(2002-07)	-0.24	0.2	0.12	14
Eleventh Plan(2007-12)	-0.16	0.13	0.34	14
Source: EPWRF, Various Years & MOSPI, Various Years				

5.2 Measurement of Expenditure Disparities across States

In this section, we investigate whether the inter-governmental transfers have fulfilled their fundamental objective of expenditure equalization across the 14 major non-special category states in India by testing whether the expenditure disparities have decreased or not. In order to do this we need to select a measure to calculate regional inequality. Such a measure should fulfil the Pigou-Dalton transfer principle which states that the arithmetical transfer from the richer citizens to the poorer citizens reduces inequality (Cowell, 1995; Song, 2013). The coefficient of variation is a commonly used indicator to measure inequality and it also satisfies the Pigou-Dalton transfer criteria (Akai & Sakata, 2005; Ezcurra, Roberto, & Pascual, 2008; Hoshino, 2011; Lessmann, 2009; Lyons, 1991; Song, 2013). Kalirajan & Otsuka(2012) and Kalirajan & Takahiro (1998) have made use of the population weighted coefficient of variation (PWCV) to measure inter-regional inequalities across states in India and is suitable for our study as the population varies considerably across the 14 major states.

The PWCV values range between zero which means complete equality and one which means maximum inequality. The PWCV has been used for four different components of expenditures in order to understand which component of expenditure has the greatest disparity (Figure 5.11). One measure is for the aggregate expenditure of states including all types of transfers wherein the PWCV is found to be the least amongst states. The second type was for aggregate expenditure net of PC transfers and the disparity is slightly higher than the one which includes all the transfers. Thus PC really does not contribute substantially in alleviating the disparities in expenditure across the 14 states. According to Bagchi (1998) although the use of the transparent Gadgil formula to determine share of states by PC brought about some degree of objectivity in their distribution, however the plan grants did little to decrease the disparities. Further, the increase of the Centrally sponsored schemes weakened the effect of Gadgil formula.

Following this the PWCV was constructed for aggregate expenditure net of FC transfers and there is a huge increase in the disparities in expenditure. Lastly PWCV was constructed for aggregate expenditure net of both PC and FC transfers and of course the disparity is the highest in such a case. Hence it can be safely concluded that spending disparities (per capita) would be greater if there were no transfers altogether. The FC transfers are more equalizing than PC transfers in reducing aggregate expenditure disparities across these states.



Source: Author's compilations from (EPWRF, Various Years)

Year (Average)	PWCV: Total expenditure including transfers	PWCV: Expenditure net of FC transfers	PWCV: Expenditure net of PC transfers	PWCV: Expenditure net of total transfers
1980-81 to 1990-91	0.25	0.32	0.27	0.35
1991-92 to 2000-01	0.3	0.37	0.32	0.42
2001-02 to 2012-13	0.3	0.36	0.29	0.42

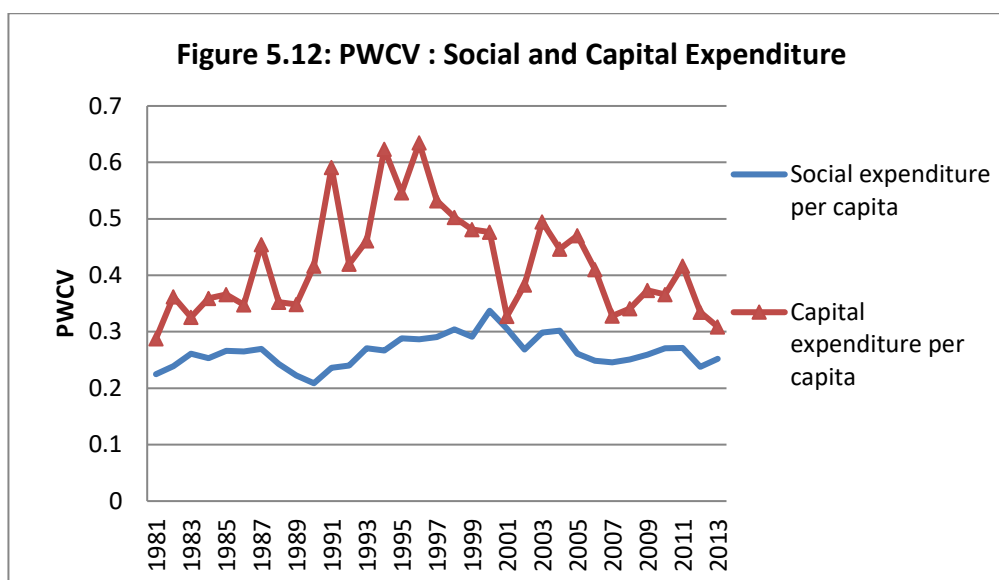
Source: Author's compilations from (EPWRF, Various Years)

It is very clear that the extent of inequalities increased after the liberalization of the Indian economy in 1990's (Table 5.6). In this period there was an increase in income growth, however it was accompanied by increase in expenditure disparities across states.

A simple regression was undertaken to understand the relationship between the inequality index and income. We regressed the PWCV on lnGSDP and found that a one unit increase in lnGSDP leads to a 1.9 unit increase in the PWCV of aggregate expenditure of states (Table 5.7).

Table 5.7 Dependent Variable: PWCV in Aggregate Expenditure of the 14 Non-Special Category States (1980-81 to 2012-13)				
Independent Variable	Coefficient	R-squared	F (P-value)	No. of Observations
lnGSDP	1.9***	0.35	0	33
Source: (EPWRF, Various Years; MOSPI, Various Years)				

Two important areas for expenditure by the government are in areas of social expenditure and capital investment. In fact the size and spread of physical and social infrastructure that is made available through government spending actually determines the private business environment for the state (Rao, 2002). Hence it is important to know if equalization has been achieved in terms of social and capital expenditure across the states included in the study. The PWCV for social expenditure and capital expenditure for the 14 non-special category states helps in understanding the extent of fiscal equalization undertaken in the country in these expenditures (Figure 5.12). These expenditures are inclusive of transfers.



Source: Author's compilations from (EPWRF, Various Years)

Year (Average)	PWCV: Social expenditure per capita	PWCV: Capital expenditure per capita
1981-82 to 1990-91	0.24	0.36
1991-92 to 2000-01	0.28	0.53
2001-02 to 2012-13	0.27	0.40

Source: Author's compilations from (EPWRF, Various Years)

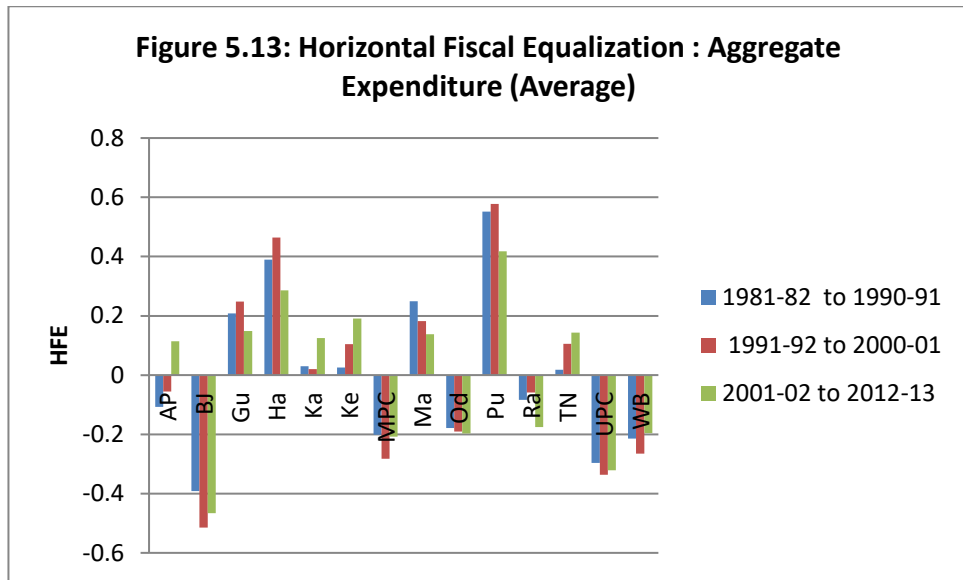
The disparities in social and capital expenditure were low prior to liberalization, increased in the decade after liberalization and declined during the period 2001-02 to 2012-13 (Table 5.8). However though the disparities decreased they are higher than the pre-liberalization period. The disparities in capital expenditure are much higher than the disparities in social expenditure in per capita terms. Even though the disparities in capital expenditure came down in the last decade, the amount of capital expenditure by all these states is still comparatively small.

Another method to understand the extent of fiscal disparities of states is by constructing a horizontal fiscal equalization index. This index helps us examine the individual performance of states regarding various components of expenditure and is based on the

index constructed by Qiao et al.(2008) (see equation 5.1). Horizontal Fiscal Equalization index (HFE) is measured taking the aggregate expenditure per capita in state “i” minus the average for all the 14 non-special category states and then dividing the value with the average in order to normalize the values. This is done for every state and for each year covered under the period of study. The aggregate expenditure includes transfers from the Centre. Here states with expenditure below average will have a negative sign and states above average will have a positive sign. A movement closer to zero will mean greater equalization being undertaken.

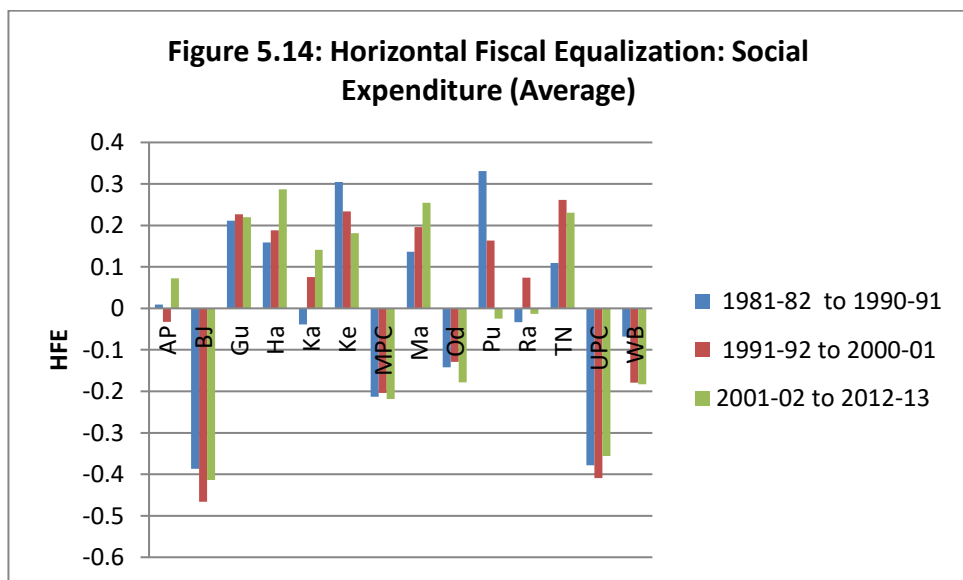
$$HFE = \frac{\text{Expenditure of state } i - \text{Average expenditure of 14 states}}{\text{Average expenditure of 14 states}} \quad (5.1)$$

We notice that there are two clear groups – one that has always been below average (BJ, MPC, Odisha , Rajasthan , UPU and West Bengal) and another group that is above average (Maharashtra, Haryana , Kerala, Gujarat, Punjab and Tamil Nadu) (Figure 5.13). The only state which has moved from below average to above average has been Andhra Pradesh. A movement towards zero means the disparities are decreasing between states. While the period 1991-92 to 2000-01 witnessed a movement away from the mean (greater disparity), the period 2001-02 to 2012-13 witnessed a slight decline in disparities as states like BJ, MPC, UPU and West Bengal (which have expenditures below the mean) saw a slight movement towards the mean (Figure 5.13). However BJ, MPC, UPU, West Bengal and Rajasthan are still away from the mean by a big distance. Odisha despite being the state that received the highest total Central transfers for all three decades covered in the study, moved further below the mean in 1990’s and 2000’s



Source: Author's Compilations from EPWRF (Various Years)

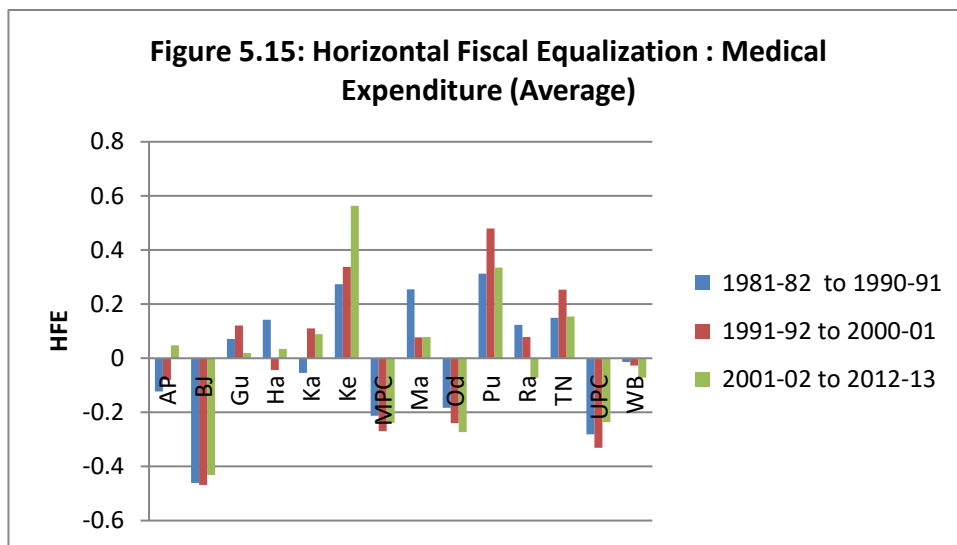
Figure 5.14 captures the extent of equalization achieved amongst states in terms of social expenditure. Here again the states performing below average are BJ, MPC, UPU, West Bengal and Odisha. What is surprising is that Punjab which is a high income state has per capita social expenditure that is below the average during the period 2001-02 to 2012-13. Rajasthan which was performing above average in the 1990's slipped below average in 2000's. Andhra Pradesh once again has shown improvement.



Source: Author's Compilations from EPWRF (Various Years)

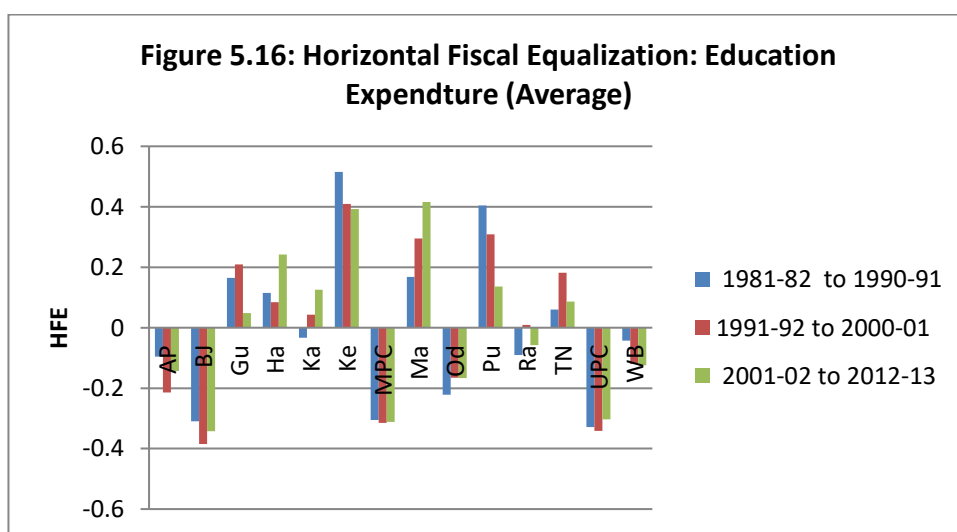
The two most important components of social expenditure are medical and education expenditure. Hence it is important to know what has been the performance of states and

the extent of disparity in these two important categories. In terms of medical expenditure again BJ, MPC, UPU and Odisha performed far below average. Andhra Pradesh once again has shown improvement by moving from below average to above average category in 2001-02 to 2012-13 (Figure 5.15). Rajasthan performed above average in the 1980's and 1990's but in the 2000's it slipped below average category. West Bengal is slightly below the mean in medical expenditure per capita.



Source: Author's Compilations from EPWRF (Various Years)

We find similar outcomes in education expenditure except for a couple of states (Figure 5.16). Andhra Pradesh remained below average for educational expenditure per capita throughout the period of study.



Source: Author's Compilations from EPWRF (Various Years)

Central transfers have helped to reduce disparities in terms of aggregate expenditure but a group of states like BJ, Odisha, MPC, UPU and Rajasthan continue to perform below average by a huge margin. Odisha had received the highest amount of total transfers from the Centre in the 1980's 1990's and 2000's and still it has not been able to move to above average category in any of the expenditure components discussed above.

5.3 Drawbacks in the Transfer System

One of the most serious defects in the system of federal transfers in India is the multiple channels through which the Centre's transfers are distributed to states. The devolution of Centre's divisible taxes and statutory grants is done through the FC. Transfers through the PC include state plan schemes, transfers to undertake Centrally sponsored schemes and the Central sector plan transfers. The statutory transfers themselves also have several components which include tax devolution, revenue deficit grants, grants for up-gradation and special problems and grants meant for local bodies and calamity relief. According to Rao & Singh (2001) these multiple channels through which transfers are disbursed without any coordinated approach cannot attain common economic objectives. Besides, the time period of the FC does not correspond with the time period of the PC's five year plans and thus proper coordination between the two institutions cannot take place while planning devolution to the states (Figure 5.6 and Figure 5.7). This disconnect in the workings of the PC and FC has hampered a proper holistic view of the states' fiscal needs and available resources (Rao & Nirvikar, 2001). Initially, the plan grants were designed to help the states in undertaking their plans by supplementing the states own resources and FC transfers. The system of providing plan grants, in addition to loans given by the PC was started because development plans mainly meant for investment, could also require additional revenue expenditures during the plan period to sustain the assets created by the plan. Such a system was expected to have no negative effects as long as the total revenue needs of the states were considered

by the FC, inclusive of the likely revenue requirements of the plans. Such a system was followed by the First and Second FCs that took into consideration the plan revenue requirements as well. This system was discontinued thereafter as FCs were directed to assess only the non-plan revenue needs of states. Grants for plan revenue expenditure would be analysed independently by the PC (FC, 2000). However economists felt that revenue balance could still be maintained if the PC considered the likely overall scenario of revenue and expenditure requirements of states. However, this became a problem when plans were undertaken without taking into account the revenue needs, letting plan revenue expenditure to be determined after the plan was implemented. This resulted in a situation where a considerable part comprised of revenue expenditure and the plan grants could cover only a part of it. This is because under the Gadgil formula for non-special category states, only 30 percent of the transfers for the state plans schemes were given as grants and the rest were given as loan (FC, 2000).

It was subsequently realized that plan grants were not able to fund the entire plan revenue expenditure in any state and a considerable part of it would have to be financed by borrowing. With increasing thrust being put on the social sector investment, borrowing was permitted for financing revenue expenditure requirements of states as well. Hence, this created extra debt-servicing burden that was passed on to the non-plan revenue account beyond what it could finance. Thus borrowing was undertaken to finance non-plan revenue deficits as well in many states. The non-plan revenue account of the states was used for maintaining the assets created during the earlier plans. These liabilities had to be considered by successive FCs as committed expenditure while assessing the needs of the states. Thus the main reason for increase in non-plan revenue expenditure is not due to the rise in non-developmental expenditure alone but also due to state plans in which revenue expenditures are largely financed by borrowings and the consequent debt burden is passed on to the non-plan account (FC, 2000).

The mixing of revenue and capital expenditure in plan outlay and financing a sizeable part of plan revenue expenditure by borrowing was regarded as a major factor contributing to the country's fiscal imbalance. Besides the state plans, the Central sector plans and Centrally sponsored schemes had become an important source of resources to the states from the PC. The main aim was to undertake projects of national relevance. The details of the schemes were determined by the Centre and their implementation and funds were allocated to the state governments who had no authority to modify these schemes or channelize funds to areas of local priority. The state budgets consequently were burdened with additional revenue liability upon the completion of these schemes and their maintenance expenditure is transferred to their non-plan account. It has also been pointed out that excessive focus on plan expenditure has led to neglect of maintenance of assets which are termed as non-plan (FC, 2000). Various bodies, including the FC had recommended the doing away of the plan and non-plan distinction of expenditure in the budget (Bagchi, 1998). With a change in government the PC itself was closed in August 2014.

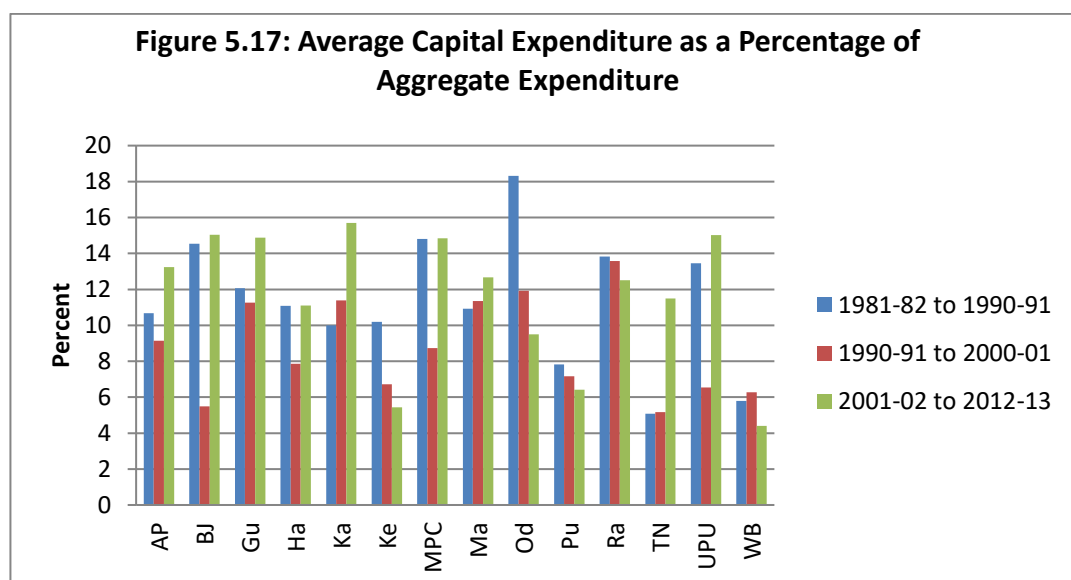
5.4 Capital Expenditure

The amount of Central capital expenditure as a percentage of consumption expenditure (net of transfers) has come down from 40 percent in the 1980's to 29 percent in the 2000's (Table 5.9). The percentage of state capital expenditure compared to revenue expenditure was 18 percent in 1980's declined to 13 percent in 1990's and again reached 18 percent in 2000's. Even in terms of Central transfers to states, only 15 % of the transfers were used for undertaking capital expenditures during the 1990's and 2000's.

Table 5.9: Central and State Government Capital Expenditure as a Percentage of Consumption Expenditure			
Year (Average)	Central government capital expenditure as a percentage of its consumption expenditure	Central government capital transfers as a percentage of current transfers	State capital expenditure as a percentage of its revenue expenditure
1981-82 to 1990-91	40	19	18
1991-92 to 2000-01	36	15	13
2001-02 to 2012-13	29	15	18

Source:(GoI, 2013)
Note: State expenditure comprises of expenditure of all the states and Union Territories.

We now briefly examine the extent of capital expenditure undertaken by states.

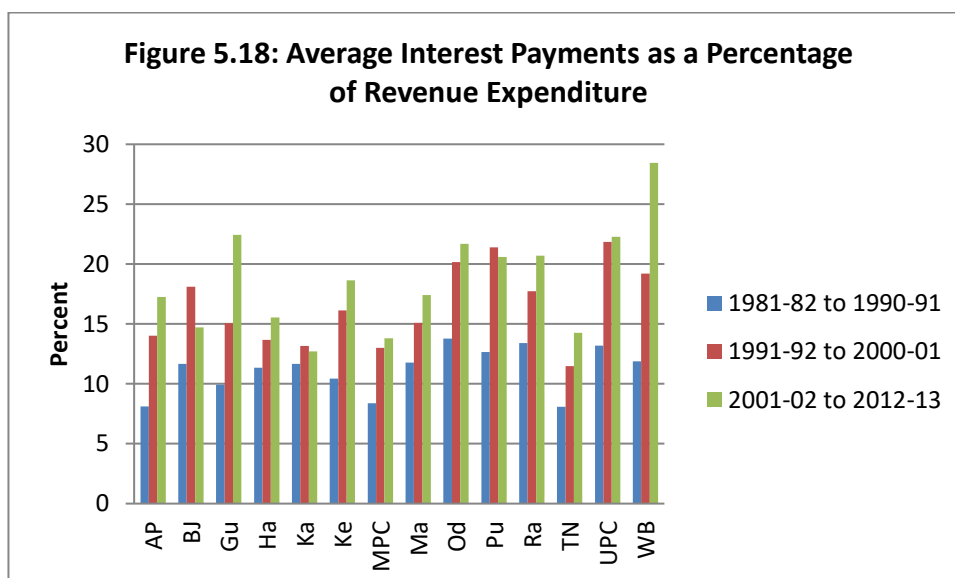


Source: Author's compilations from EPWRF (Various Years)

In the 1980's Odisha had the highest percentage of capital expenditure (18 percent) (Figure 5.17). However in the 1990's it dropped sharply to 12 percent and in 2000's it further dropped to 9 percent even though it received the highest amount of Central transfers over the years. In 1980's besides Odisha, the other states which had high capital expenditure were MPC and BJ at 15 percent followed by Rajasthan (14 percent) and UPU (13 percent). In 2000's, the states which had the highest share of capital expenditure were Karnataka (16 percent) followed by Gujarat, UPU, BJ and MPC (15 percent). The state which spent the least share in capital expenditure was West Bengal

(4 percent) followed by Kerala (5 percent) and Punjab (6 percent). Interestingly though some of the low income states spend higher percentage on capital expenditure. The amount spent on capital expenditure is still low. In order to increase the productive capacity of the states they need to increase their share of capital expenditure. One of the important reasons for the decline in capital expenditure by states is the increase in expenditure on salaries, pensions, interest payments and subsidies has crowded out investment on physical infrastructure (Rao, 2002).

One of the major components that has led to an increase in the revenue expenditure is the growth in Interest Payments (IP). This has steadily increased for most of the states during 2000's as compared to the average of 1990's and 1980's (Figure 5.18).

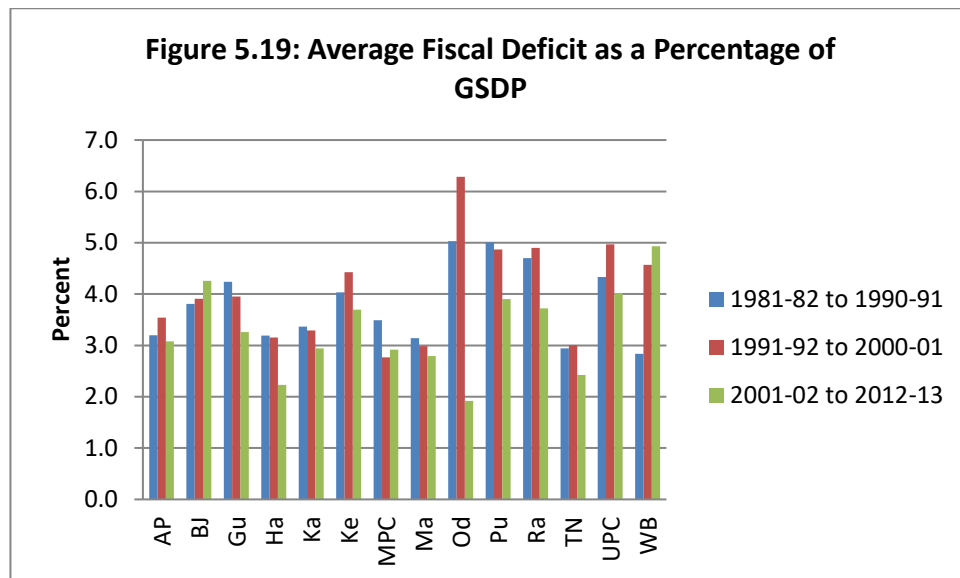


Source: Author's compilations from EPWRF (Various Years)

West Bengal topped the list with 28% of its revenue expenditure spent on interest payments in 2001-02 to 2012-13. It was followed by Gujarat, UPU , Odisha (22 percent), Punjab and Rajasthan (20 percent). The state that spent the least on interest payments as percentage of the revenue expenditure was Karnataka (13 percent) followed by MPC and Tamil Nadu (14 percent) and BJ (15 percent).

5.5 Transfers and Fiscal Deficit

In this section we examine the impact of transfers on fiscal deficit.



Source: Author's compilations from EPWRF (Various Years)

The fiscal deficit of most states declined in 2000's as compared to the 1990's. In fact in Odisha the fiscal deficit declined dramatically from 6.3 percent in 1990's to 1.9 percent in 2000's, the lowest amongst states during this period (Figure 5.19). In the 2000's the state with the highest fiscal deficit was West Bengal (4.9) followed by BJ (4.3) and UPU (4.0). Odisha (1.9) and MPC (2.9) performed better than Punjab (3.9) and Gujarat (3.3).

There is a view that transfers can lead to fiscal profligacy specially if proper accountability measures are not put in place (Eyraud & Lusinyan, 2013; Schaltegger & Feld, 2009). However, fiscal transfers have also been found to improve the fiscal positions in some countries (De Mello, 2000). Bhatt & Scaramozzino (2013) examined the relationship between federal transfers and fiscal deficits in India from 1990 to 2010 using a panel dataset and they found that there exists a bi-directional causality between fiscal deficit and FC transfers.

We will now examine if transfers have had any impact on fiscal deficit. We anticipate that fiscal deficit is impacted by transfers from the FC and the PC as discussed above. We also expect that the state's own revenue earning potential, inflation rate and growth rate would influence fiscal deficit. The FRBM Act is also expected to influence the

level of fiscal deficit. The period post FRBM should see a lowering of fiscal deficit. The use of growth rate and FRBM act as control variables with fiscal deficit as the dependent variables has been discussed in Chapter 4. State own revenue - GSDP ratio has been used as a control variable as one of the reasons for the increase in fiscal deficit has been the decline in state own revenues or inadequate collection of taxes by state governments (FC, various years).

For our analysis the transfers have been disaggregated into the following categories, as indicated below:

- i) FC transfers which includes states' share in Central taxes and non-plan grants
- ii) PC transfers which comprises of Centrally sponsored schemes, Central plan schemes and state plan Schemes.
- iii) Discretionary transfers which comprise of Centrally sponsored schemes and Central plan Schemes.
- iv) Formula based transfers which include states' share in Central taxes and state plan schemes
- v) Total transfers which includes PC and FC transfers

The econometric model we use to test the impact of transfers on FD is as follows:

$$FD_{it} = \beta_0 + \beta_1 \ln Transfers_{it} + \beta_2 Orr_{it} + \beta_3 Growthrate_{it} + \beta_4 FRBM_{it} + e_{it} \quad (5.2)$$

Where "i" stands for state and "t" stands for time

FD: Fiscal Deficit is measured as a percentage of GSDP at current prices

Intransfers: natural log of transfers from Centre to states expressed in per capita terms at current prices

Growth rate: growth rate in GSDP per capita at current prices

FRBM Act: dummy variable for the year in which the act was implemented in the state.

Orr: State's own revenue divided by GSDP at current prices

e: error term

Hence five different regressions are undertaken to understand the impact of transfers as classified above on FD for the time period 1981-82 to 2012-13 for 14 major Indian states

As in the earlier regression, the Breusch Pagan Lagrangian Multiplier test and Sargan Hansen statistic confirmed that the fixed effects model is preferred to the random effects model (Table 5.9). We find that the total transfers have a significant and positive impact on FD. A one percent increase in transfers leads to a 0.53 percent increase in FD. FC transfers seem to have a greater impact on FD as compared to PC transfers.

Variables	1	2	3	4	5
FRBM Act	-2.26***	-2.29	-1.9***	-.2.18***	-.2.00***
Growth rate	-0.04***	-0.04***	-0.05***	-.0.043***	-.0.046***
Orr	-5.7	-9.05	-0.1509	-4.57	-0.365
In Total transfers	.53***				
InFC		.57***			
In PC			0.4***		
In Formula based transfers				0.473***	
In Discretionary transfers					0.39***
Constant	6.81	5.17***	5.15***	6.22	3.41
Adjusted R-squared	within = 0.3 between = 0.14 overall = 0.27	within = 0.34 between = 0.14 overall = 0.27	within = 0.29 between = 0.12 overall = 0.26	within = 0.29 between = 0.15 overall = 0.7	within = 0.2942 between = 0.0082 overall = 0.2471
F statistic F(4,13)	20.20	23.4	15.17	18.24	14.82
F statistic (P-value)	0.00	0.00	0.00	0.00	0.00
Sargan-Hansen statistic (P-value)	0.00	0.00	0.00	0.00	0.00
Modified Wald test (P-value)	0.00	0.00	0.00	0.00	0.00
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00
Robust clustered standard errors, No. of obs 448					

While transfers can impact fiscal deficit, states with higher fiscal deficits may also attract greater transfers. This is the problem of endogeneity and has to be accounted for. As discussed in chapter three, one way to account for this is by using a 2SLS regression (instrumental variable) methodology as specified in equations 5.3 and 5.4. The first lag of the transfers were used as instruments to generate the predicted values of the endogenous variables (Table 5.10).

The IV first stage regression equation is as follows:

$$\ln Transfers_{it} = \beta_0 + \beta_1 Lag1_ln Transfers_{it} + \beta_2 Orr_{it} + \beta_3 Growthrate_{it} + \beta_4 FRBM_{it} + e_{it} \quad (5.3)$$

The IV second stage least square regression equation is as follows:

$$FD_{it} = \beta_0 + \beta_1 Predicted_ln Transfers_{it} + \beta_2 Orr_{it} + \beta_3 Growthrate_{it} + \beta_4 FRBM_{it} + e_{it} \quad (5.4)$$

	LN Total transfers	LNFC	LN PC	LN Formula	LN Discretionary
FRBMAct	0.13***	0.18***	0.24***	0.12***	0.53***
Growthrate	-.001	-.001	0.001	0.001	0.002
Sorr	4.61**	4.62***	-.3.48***	0.48	2.44
Lag1_In Total transfers	0.81***				
Lag1_InFC		0.872***			
Lag1_Inplan			0.95***		
Lag1_In Formula				0.95***	
Lag1_In Discretionary					0.65***
F test of excluded instruments	F(1, 13) = 1079.1 Prob > F = 0.000	F(1,13) = 1089.1 Prob > F = 0.000	F(1, 3) = 4040.07 Prob > F = 0.000	F(1, 13) = 6696.42 Prob > F = 0.000	F(1, 13) = 49.32 Prob > F = 0.000
Sanderson-Windmeijer (SW) F test of weak identification	SWF(1,13) 3368.48	SW F (1,13) 1089.10	SWF (1,13) 4040.1	SW F (1,13) 6696.42	SW F (1,13) 49.32
Weak indentification test (Stock-Yogo) critical values: 10%	16.38	16.38	16.38	16.38	16.38
Sanderson-Windmeijer (SW) first-stage chi-squared test of under-identification	SW Chi-sq(1) 3652.9 (P-value)= 0.000	SW Chi-sq(1) 1181.06 (P-value)= 0.000	SW Chi-sq(1) 4381 (P-value) =0.000	SW Chi-sq(1) 7261.84 (P-value) =0.000	SW Chi-sq(1) 53.49 (P-value)= 0.00
No. of observations 434					

Table 5.11 IV (2SLS) Estimation Fixed Effects Estimation, Dependent Variable: FD					
Dependent Variables	1	2	3	4	5
FRBM Act	-.227***	2.33***	-.212***	-.223***	-.197***
Growth rate	-.045***	.045***	-.046***	0.045***	-.047***
Orr	-.5.81	-.9.74	0.2692	-5.19	-0.24
ln Total transfers	.52***				
ln FC		.595***			
lnPC			.391**		
ln Formula transfers				0.498**	
lnDiscretionary					0.358***
Centered R2	0.3	0.3	0.3	0.3	0.3
F statistic: Kleibergen-Paap rk Wald weak identification	3368.48	1089.101	4040.068	6696.42	49.32
Critical values: Stock-Yogo weak ID test: 10% maximal IV size	16.38	16	16.38	16	16
Kleibergen-Paap rk Underidentification Test (P value)	0	0	0	0	0
Endogeneity test of endogenous regressors: Chi-sq(1) (P-value)	0.048	0.00	0.74	0.014	0.9477
Instrumented Variable:	lnTotal transfers	lnFC	ln PC	ln Formula	ln Discretionary
Excluded instruments:	Lag1_InTotal transfers	Lag1_In FC	Llag1_In PC	Lag1_In Formula	Lag1_In Discretionary
Robust clustered standard error, No. of observations 434					

The FC and formula based transfers were found to be endogenous, however the PC and discretionary transfers were not endogenous. This means that an increase in fiscal deficit also leads to an increase in FC and formula based transfers to those states. While transfers were found to impact fiscal deficit positively, however FC and formula based transfers seemed to have a greater impact on FD (Table 5.11).

5.6 Impact of Political factors on the Devolution of Inter-governmental Transfers

Some of the empirical studies reveal that the devolution of inter-governmental transfers to sub-national governments are not determined solely by the traditional objectives of

equity and efficiency, and that political factors that reflect electoral incentives of public authorities play a significant role as well (Grossman, 1994; Porto & Sanguinetti, 2001; Worthington & Dollery, 1998).

In this section we examine the hypothesis whether political factors influence the amount of transfers received by states in India. There are multiple channels by which transfers are devolved to states based on different institutional arrangements. We try to find out whether these institutions are affected by political factors while disbursing transfers to states.

Rao & Singh (2001) considered Centre-state inter-governmental transfers to reflect the complex relationship between the Central and state governments in India. According to them transfers to states are determined by an intricate mix of Constitutional acts, institutional guidance, discretionary decisions and negotiation between governments. Even though transparent formulas are used to determine a part of the transfers, there is considerable discretion in allocating other transfers. Using a panel data analysis they found evidence regarding the bargaining view of federalism during 1983-84 to 1992-93. States with greater bargaining power at the Centre received greater per capita transfers. They used a political variable (dummy variable) for political affiliation that took the value one for the year when the party at the Centre and the state was the same and zero otherwise. Another political variable that is the share of each states' parliamentary representation in the Union government was also used by the authors.

In another panel data study of 15 major states of India, over the period 1972-73 to 1995-96 Khemani, (2003) found that the discretionary transfers were influenced by political agents whose objective was to maximize partisan representation in the Union government. The political variables used in this study comprise of proportion of seats in the state that were controlled by the national ruling party in the Union government and political affiliation (dummy variable). An important feature of the study is that the

transfers were disaggregated into discretionary and other institutional transfers. Similarly larger lobbying power with the Central government permitted states to receive larger per-capita transfers (Singh & Vashishtha, 2004). The bargaining capacity of each state was measured by dividing the number of Members of Parliament (MPs) of each state that are a part of the ruling party at the Centre to the total MPs from that state. A similar result was found when lobbying capacity was measured from the state representation in the Central Council of Ministers (Biswas & Marjit, 2014). Garg et al. (2014) examined whether lobbying could also be decided by the heterogeneity of political parties. They found that states with greater number of effective parties received fewer transfers.

In keeping with this literature we try to understand if the disaggregated transfers are amenable to political lobbying given that some of the transfers are rule based and some are discretionary.

As has been discussed earlier in section 5.1 while states with lower per capita income receive higher transfers from the FC however many of the high income states like Punjab and Haryana have received higher transfers than Bihar specially in the 1980's and 1990's from the PC. Even in 2000's Bihar and Uttar Pradesh received less PC transfers than Punjab (Table 5.12). We extend our analysis to check whether political factors influence transfers using an econometric model following the lines of earlier literature.

Table 5.12 : Transfers per capita and GSDP per capita at Current Prices									
	1981-82 to 1990-91			1991-92 to 2000-01			2001-02 to 2012-13		
State	FC	PC	GSDP	FC	PC	GSDP	FC	PC	GSDP
AP	118	53	3047	407	162	12068	1470	597	42137
BJ	129	44	2040	413	95	5529	1751	558	15270
Gu	82	55	4394	301	123	16366	992	458	51868
Ha	85	61	5028	222	145	17841	918	473	63852
Ka	102	49	3308	341	153	12890	1363	633	41893
Ke	124	53	3133	392	142	13877	1313	473	49974
MPC	116	59	2763	371	162	9518	1629	660	25353
Ma	98	48	4926	253	110	18600	862	510	58233
Od	166	76	2518	510	203	8063	2043	803	27119
Pu	93	49	5908	278	121	19688	976	550	53030
Ra	113	88	2736	408	202	10462	1471	480	30329
TN	123	52	3440	372	145	14726	1299	422	49187
UPU	120	60	2531	367	146	8167	1633	478	21105
WB	126	40	3484	366	124	11327	1398	493	33814
Source: Author's compilations from EPWRF (Various Years) ; MOSPI(Various Years)									

The transfers have been disaggregated into the following categories, as indicated below:

- vi) FC transfers which includes states share in Central taxes and non-plan grants
- vii) PC transfers which comprises of Centrally sponsored schemes, Central plan schemes and state plan Schemes.
- viii) Discretionary transfers which comprise of Centrally sponsored schemes and Central plan Schemes.
- ix) Formula based transfers which include states share in Central taxes and state plan schemes
- x) Total transfers which includes PC and FC transfers

All transfers are expressed as a ratio of GSDP at current prices.

Each of these transfers is separately evaluated using our econometric model. Hence five different regressions are undertaken to test the impact of political variable on different types of transfers as classified above.

The political variables included in the model are:

- i) **Alliance:** is a dummy variable which takes the value one when the government at the Centre and the state are the same or is a part of the coalition government at the Centre and zero otherwise. This variable has previously been used by Rao & Singh (2001) and Khemani (2003)
- ii) **ENP:** Effective number of Political parties (ENP) was first used by Laakso and Taagepera (1979). ENP measures the number of political parties in a state which is weighted depending on the vote share of the respective parties.

Effective number of political parties (ENP) is calculated as follows:

$$ENP = \frac{1}{\sum_{i=1}^n X_i^2} \quad (5.5)$$

Where X_i is the proportion of the votes received by party i . n is the number of political parties with at least a minimum of one seat.

In order to create the ENP variable, we have collected data on results from the state elections from 1981-82 to 2012-13. In the next step we calculated the proportion of votes received by each party by taking the ratio of the number of seats won by each political party to the total number of seats. This proportion thus calculated was then squared for each party. Then the reciprocal of the sum of squares is calculated to derive value of ENP. If one party gets all the votes, then ENP takes value 1 and is similar to the number of parties contesting the election when each party secures equal number of votes.

As discussed earlier, a part of the transfers from the Centre to the states in India are formula-based. Two state level variables, population and income have played an important role in the formulas used to determine transfers by the FC and PC. Successive FCs have applied different weights on the criteria of population, inverse of per capita income and other measures including relative poverty, infrastructure or “backwardness” and area of states. These summed together resulted in 80-90 percent of the weightage,

while the tax contribution and fiscal discipline contributed to the remaining 10-20 percent. For non-plan grants, successive FCs have used discretion in deciding the relative needs of states with the main objective of giving more assistance to states with fiscal disabilities. PC has used modified versions of the Gadgil formula since 1969. Here too around 80 percent of the weightage was given to population and the inverse of income. Thus income, population, and state fixed effects could explain a sizeable amount of change in these Central transfers across states (Khemani, 2003). Keeping these factors in mind, we use an econometric model with the following control variables:

Lag1_LNGSDP: Natural log of Gross State Domestic Product per capita at current prices (lagged by a year). The lag was used in order to avoid the problem of probable endogeneity between income and transfers.

Poverty: Ratio of total number of poor in state to the total number of poor in the country. Since both the PC and FC transfers are meant to be equalizing, poverty as a variable can be used to represent backwardness, need as well as cost disabilities of states.

FRBM Act = Dummy variable for the year of implementation of the FRBM act in the state. According to Medium Term fiscal restructuring programme, states would receive additional Central grants according to their fiscal performance. Only those states that implemented the FRBM Act could avail of the benefits of this debt restructuring programme (Rao, 2004).

e: error term

In this section we examine whether transfers from Centre to the 14 non- special category states are subject to political bargaining using a panel data regression (see equation 5.6). Data used in the study is for the period 1981-82 to 2012-13. All the variables used have been expressed in current prices.

$$Transfers_{it} = \beta_0 + \beta_1 Lag1_LNGSDP_{it} + \beta_2 Alliance_{it} + \beta_3 ENP_{it} + \beta_4 Poverty_{it} + \beta_5 FRBM_{it} + e_{it} \quad (5.6)$$

where “i” refers to State and “t” refers to time

The Breusch and Pagan Lagrangian multiplier test and the Sargan Hansen statistic confirmed that the fixed effects model is more appropriate than the random effects model. Results from all five definitions of transfers are presented in Table 5.13. None of the political variables are significant in this model, except for political alliance in the case of FC transfers. Political alliance variable is significant and negative that means in the years the Centre and state have an alliance, there are less FC transfers to those states. According to Khemani (2003) it is very much possible that FC transfers help to offset political influence in disbursement of Central transfers. The main responsibility of the FC is to distribute transfers to states in order to decrease fiscal disparities, with greater resources allocated to disadvantaged states. If politically non-affiliated states receive less transfers either through Central transfers or overall national investments, then it is possible that they would receive greater transfers from the FC as they fall in the category of resource-poor states.

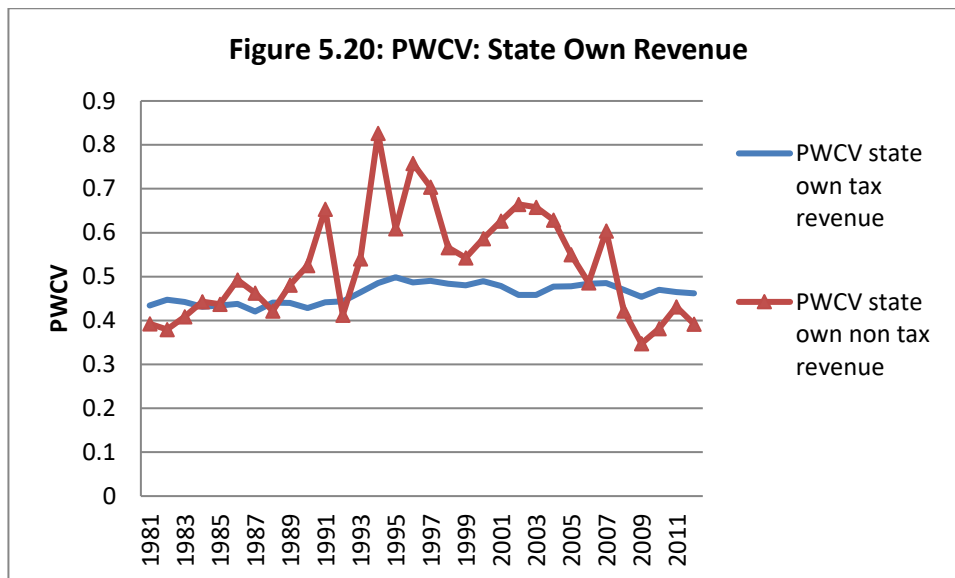
As expected, income is negative and significant which confirms that transfers are indeed equalizing. FRBM act is significant and positive for all five measures of transfers which as explained earlier is expected as states that implemented the FRBM Act were entitled to receive greater Central grants. Poverty variable is significant only in the case of formula based transfers.

Table 5.13 Fixed-Effects (within) Regression, Dependent Variable: Transfers divided by GSDP					
Variables	Total Transfers	FC	PC	Formula based	Discretionary
Lag1_LNGSDP	-0.01***	-0.003***	-0.004***	-0.002*	-0.002***
Alliance	-0.002	-0.002**	0.00001	-0.003	0.00001
ENP	0.001	0.001	-0.001	0.002	-0.001
Poverty	0.002	0.001	0.0002	0.002**	0.0003
FRBM	0.13***	0.01***	0.005***	0.012***	0.002**
Constant	0.12***	0.07***	0.05***	0.38***	0.24***
Adjusted R squared	within = 0.25 between = 0.38 overall = 0.35	within = 0.19 between = 0.37 overall = 0.34	within = 0.24 between = 0.39 overall = 0.3	within = 0.27 between = 0.51 overall = 0.46	within = 0.23 between = 0.35 overall = 0.27
F statistic (5,13)	21.3	11.68	33.77	5.06	9.14
F statistic (5,13) (P-value)	0.005	0.002	0.01	0.0062	0.0062
Sargan-Hansen statistic (P-value)	0.00	0.00	0.00	0.00	0.00
Modified Wald test (P-value)	0.00	0.00	0.00	0.00	0.00
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00
Robust clustered standard errors, No of obs 448					

5.7 Transfers and State Tax Effort

Transfers can be considered as cash flows to states wherein states many a times do not have any direct burden in their collection and this may adversely affect the state's own revenue collection. In this section, we try to find out whether transfers have had an adverse effect on state government's effort to raise own tax revenue.

We begin by analysing the extent of disparities in state own revenue receipts. The disparities and variations in own non-tax revenue are much higher than that of own tax revenue. Since 2009-10 the disparities in own non-tax revenue decreased considerably even below the disparities in the own tax revenue (Figure 5.20).



Author's calculations from MOSPI (Various years)

On an average the disparities seemed to have increased marginally in the 1990's as compared to the 1980's and remained higher in 2000's (Table 5. 14).

Table 5.14: Population Weighted Coefficient of Variation: State Revenue		
Year (Average)	PWCV: State own tax revenue	PWCV: State own non tax revenue
1981-82 to 1990-91	0.44	0.44
1991-92 to 2000-01	0.48	0.62
2001-02 to 2012-13	0.47	0.51
Author's calculations from MOSPI (Various years)		

In the literature GSDP per capita has been used as a proxy for the tax base. Hence in this chapter too we study the performance of states in terms of their GSDP per capita at current prices.

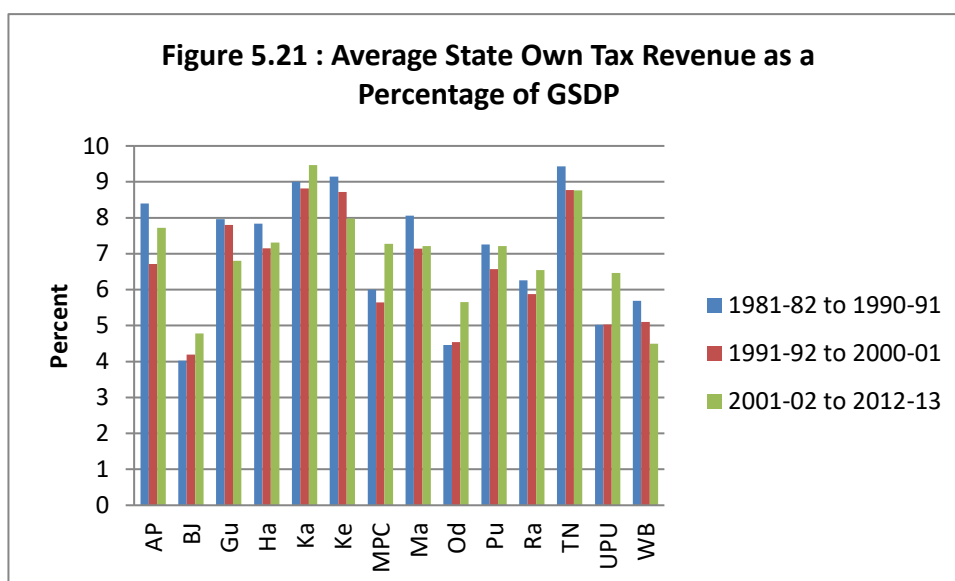
Rank	State	1981-82 to 1990-91	State	1991-92 to 2000-01	State	2001-02 to 2012-13
1	Pu	5908	Pu	19688	Ha	63852
2	Ha	5028	Ma	18600	Ma	58233
3	Ma	4926	Ha	17841	Pu	53030
4	Gu	4394	Gu	16366	Gu	51868
5	WB	3484	TN	14726	Ke	49974
6	TN	3440	Ke	13877	TN	49187
7	Ka	3308	Ka	12890	AP	42137
8	Ke	3133	AP	12068	Ka	41893
9	AP	3047	WB	11327	WB	33814
10	MPC	2763	Ra	10462	Ra	30329
11	Ra	2736	MPC	9518	Od	27119
12	UPU	2531	UPU	8167	MPC	25353
13	Od	2518	Od	8063	UPU	21105
14	BJ	2040	BJ	5529	BJ	15270

Source: (MOSPI, Various Years)

In 1980's and 1990's Punjab was the state with the highest GSDP per capita, however in 2000's it slipped to third position (Table 5.15). During 2000-01 to 2012-13, the states with highest GSDP per capita were Haryana, followed by Maharashtra, Punjab, Gujarat and Kerala. The state which has consistently been lowest is BJ. Odisha which receives the highest amount of transfers was second last in terms of GSDP per capita in 1980's and 1990's and then moved to the fourth last position in 2000's. MPC was the fifth highest state to receive total transfers in 1980's was fourth in 1990's and third in 2000's. But in terms of GSDP per capita it was the fifth lowest state in 1980's and slipped to fourth lowest state in 1990's and third lowest state in 2000's.

The actual tax to GSDP ratio is usually treated as a measure of tax effort and widely used in studies undertaking cross country tax comparison (Raychaudhuri & Roy, 2013). In terms of state own tax revenue as a percentage of GSDP, the best performing state was Karnataka (9.5) followed by Tamil Nadu (8.8) and Kerala (8) during 2001-02 to 2012-13 (Figure 5.21). What is encouraging is that MPC (7.3) and Andhra Pradesh (7.7)

are performing better than higher income states like Maharashtra (7.2), Punjab (7.2) and Gujarat (6.8). The state with the least share of tax revenue as a percentage of GSDP was West Bengal (4.5) followed by BJ (4.8) and Odisha (5.6).



Author's compilations from EPWRF (Various years); MOSPI (Various years)

In this section we examine whether inter-governmental transfers promote or adversely affect state tax effort. Many international studies have found a negative impact of Central transfers on local tax effort (Buettner & Wildasin, 2006; Courchene, 1994; Dahlby & Warren, 2003; Snoddon, 2003; Zhuravskaya, 2000). There are a few empirical studies that have tried to find out the relation between Central transfers and tax revenue of states in India. Some have found a negative effect of Central transfers on the state revenue-income ratio in India (Naganathan & Sivagnanam, 2000). Per-capita transfers received by respective states also have a negative effect on per-capita own tax revenue (Panda, 2009). A panel data study on 14 major Indian states for the time period 1992 to 2010 found that inter-governmental transfers have a negative impact on tax efficiency of states (Garg et al., 2014). If transfers are divided into conditional and unconditional transfers then tax collection is negatively associated with unconditional transfers (Dash & Raj, 2013). Direct tax collection was found to be more sensitive to these transfers.

In light of this discussion we wish to test the hypothesis that transfers have no significant impact on state tax effort. Besides transfers we expect that state tax effort is also influenced by the Literacy rates, implementation of FRBM Act and population density.

Increase in literacy rates leads to improvement in human capital. An increase in literacy rates also leads to better employment opportunities for the country's labour force and improvement in their socio-economic status (Desai, 2012). Hence an improvement in literacy rates is expected to have a positive influence on state tax effort.

Implementation of FRBMA has had a positive impact on state finances. This Act has encouraged state governments to increase their revenue and reduce their expenditure. Garg et al. (2014) in their panel data analysis from 1992-2010 for 14 major Indian states found a negative relation between FRBM act and tax inefficiency.

Higher population densities could enable higher intensity of economic activities by promoting agglomeration economies and thus could enable greater revenue generation. However, population density could also have negative effects depending upon factors like sufficient amount of resources in the state, dependency ratio, etc. Hence population density could also have a negative impact on state tax resources as there is increased pressure on scarce state resources (Liu & Yamauchi, 2014) .

For our analysis transfers have been disaggregated as follows

- i) FC transfers which includes states share in Central taxes and Non Plan Grants
- ii) PC transfers which comprises of Centrally sponsored schemes, Central plan Schemes and state plan schemes.
- iii) Discretionary transfers which comprise of Centrally sponsored schemes and Central plan schemes.

- iv) Formula based transfers which comprise of states share in Central taxes and state plan schemes
- v) Total Transfers = PC and FC transfers

All transfers are expressed as a ratio of GSDP at current prices

In order to understand the impact of transfers on state tax effort we used a panel regression model for 14 major states for the time period 1981-82 to 2012-13

The linear regression model takes the form:

$$SOTR_{it} = \beta_1 it + \beta_2 agri_{it} + \beta_3 transfers_{it} + \beta_4 Popden_{it} + \beta_5 FRBMA_{it} + e_{it} \quad (5.7)$$

where,

“i” refers to State and “t” refers to time

SOTR: State own tax revenue divided by GSDP at current prices

AGRI : share of agricultural GSDP divided by GSDP at current prices.

Transfers : defined as transfers divided by GSDP and disaggregated according to classifications specified above.

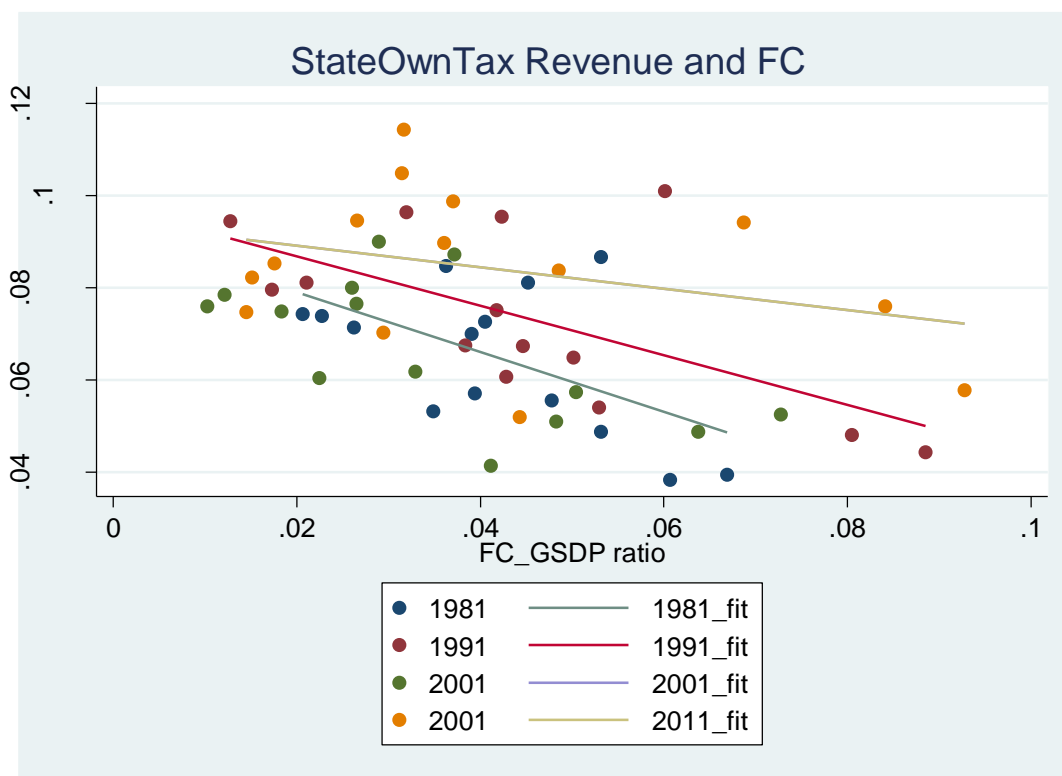
Popden stands for population density.

FRBM is the dummy variable which takes the value one for the year of implementation of the FRBM in the state and zero otherwise.

e: error term

A simple scatter plot between transfers and state tax effort shows a negative trend between FC transfers and state tax effort (Figure 5.22).

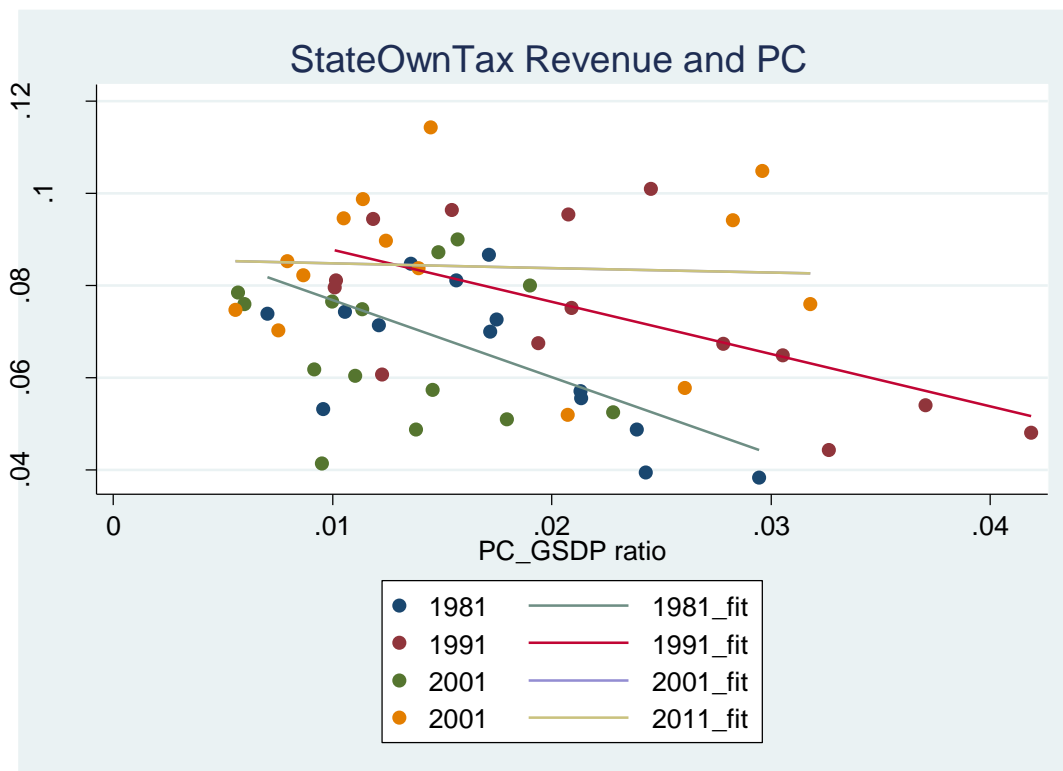
Figure 5.22: Relation between State Own Tax Revenue and FC Transfers across 14 States.



Source: Author's compilations from EPWRF (Various Years); MOSPI (Various Years)

Note: State own tax revenue and FC transfers have been expressed as a ratio of GSDP at current prices

Figure 5.23: Relation between State Own Tax Revenue and PC Transfers across 14 States.



Source: Author's compilations from EPWRF(Various Years); MOSPI (Various Years)

Note: State own tax revenue and PC transfers have been expressed as a ratio of GSDP at current prices.

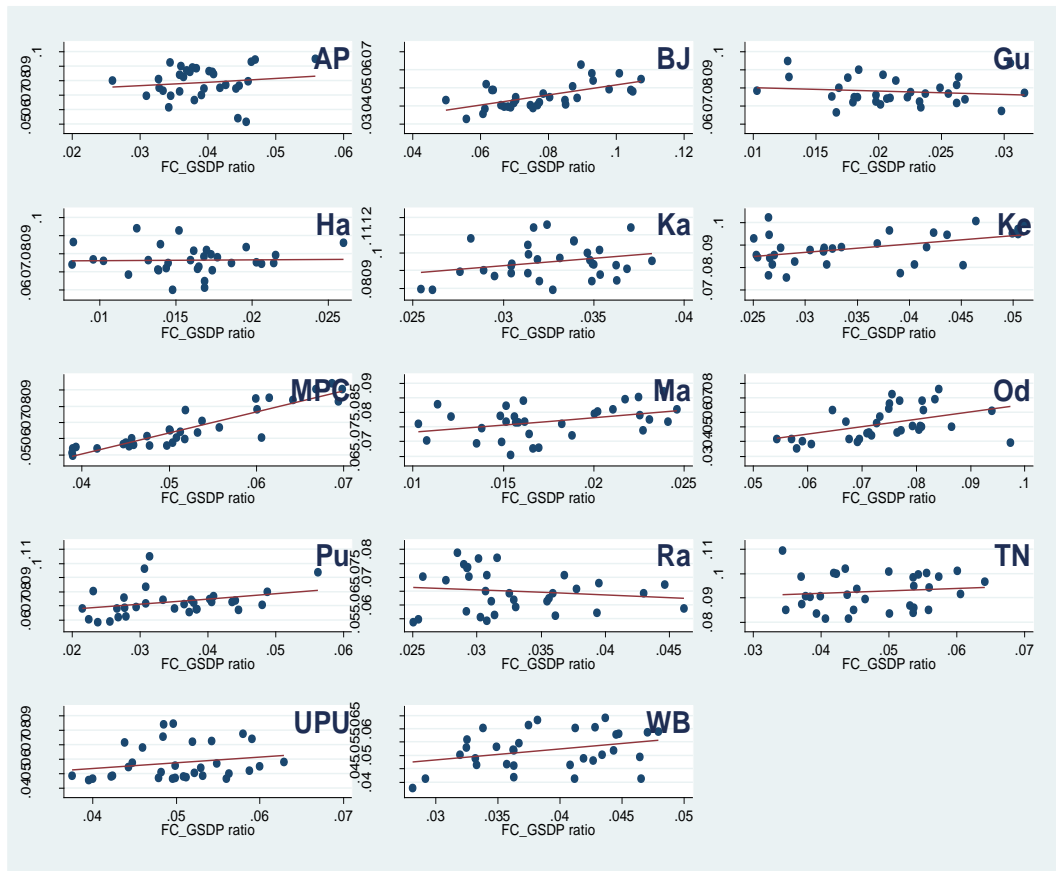
In conformity with the results of the earlier studies, our results of a pooled OLS regression model also finds a negative relation between FC transfers and state tax effort. PC transfers do not have a significant effect on state tax effort (Table 5.16).

Table 5.16: Pooled OLS regression, Dependent Variable: Ratio of state Own Tax Revenue Divided by GSDP					
Variables	1	2	3	4	5
Total Transfers	-0.1***				
FC transfers		-0.2***			
PC transfers			-0.1		
Formula based				-.21***	
Discretionary transfers					-0.01
Literacy rate	0.001***	0.001***	0.001**	.0001***	.07***
FRBM	0.01***	0.01***	0.01***	.012***	.003*
Popden	-0.00002***	-0.00001***	-0.00001***	-.00002***	-.00001***
Constant	0.10***	0.09***	.10***	.10***	.085***
Rsquared	0.41	0.43	0.39	0.41	0.28
F Statistic(4, 443)	79.66	111.5	75.8	93.4	93.4
F Statistic (4, 443)(P-value)	0.00	0.00	0.00	0.00	0.00
Breusch and Pagan Lagrangian multiplier test for random effects (P-value)	0.00	0.00	0.00	0.00	0.00
Robust standard errors No. of Obs 448					

However when we undertake scatter plots for individual states over time there seems to be a positive relation between Central transfers and state tax effort for most of the states (Figure 5.24 and 5.25). In the case of FC transfers states like Andhra Pradesh, Bihar, Karnataka, Kerala, Madhya Pradesh, Odisha and West Bengal seem to clearly have a positive relation with state tax effort (Figure 5.24). In terms of PC transfers states like Bihar, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Punjab and West Bengal seem to have a positive relation with state tax effort (Figure 5.25).

In order to econometrically test this we undertake a FE panel model. This allows us to examine the within variation.

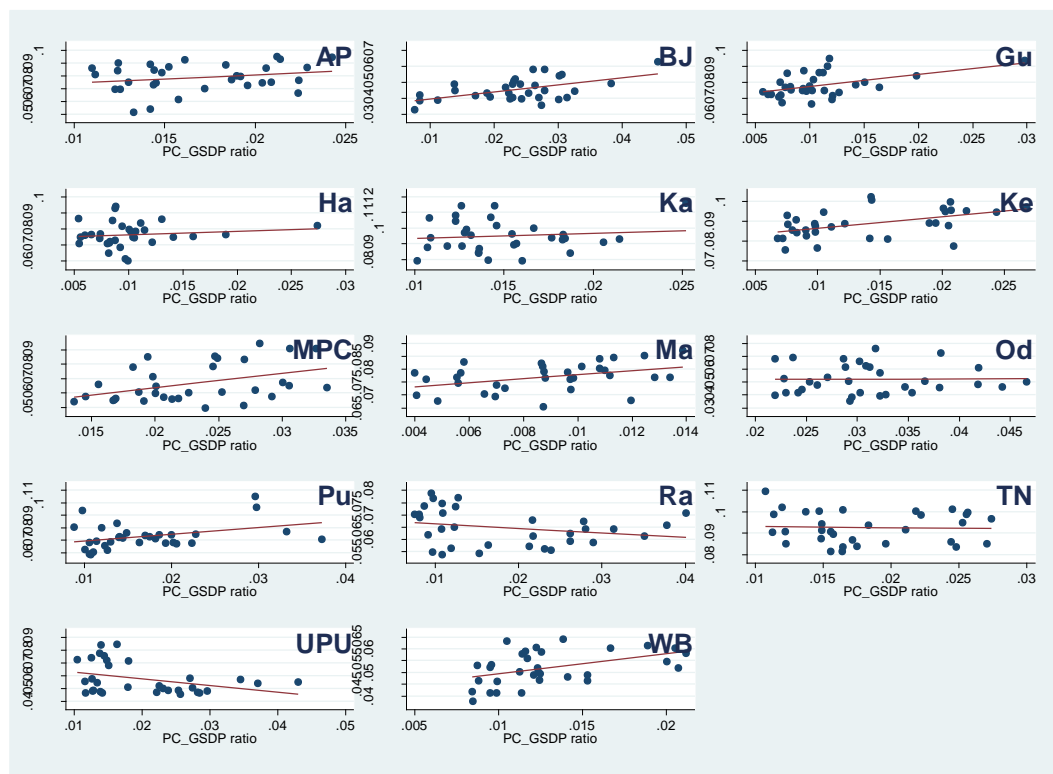
Figure 5.24: Relation between State Own Tax Revenue FC Transfers of 14 Major States, 1981-82 to 2012-13



Source: Author’s compilations from EPWRF(Various Years); MOSPI (Various Years)

Note: State own tax revenue and FC transfers have been expressed as a ratio of GSDP at current prices

Figure 5.25: Relation between State Own Tax Revenue and PC Transfers of 14 Major States, 1981-82 to 2012-13



Source: Author's compilations from EPWRF (Various Years); MOSPI (Various Years)

Note: State own tax revenue and PC transfers have been expressed as a ratio of GSDP at current prices.

The Breusch and Pagan Lagrangian Multiplier Test and Sargan Hansen statistic further confirm that the fixed effects model is a more appropriate one. The results of the model confirm that when we look at states individually over time there is a positive relation between transfers and state tax effort (Table 5.17).

Table 5.17 Fixed-Effects (within) Regression, Dependent Variable: Ratio of State Own Tax Revenue Divided by GSDP					
	1	2	3	4	5
FC transfers	0.38***				
PC transfers		0.47***			
Formula transfers			0.43***		
Discretionary transfers				0.8***	
Total transfers					0.3***
Literacy rate	0.0003** *	0.0004** *	0.0004**	.0003** *	.0004** *
FRBMAct	0.01***	0.01***	0.01***	.01***	.011***
Popden	-0.0003	-0.0001	- 0.0005** *	-0.0001	-0.0005
Constant	0.05***	0.05***	0.05***	.05***	.05***
R-squared	within = 0.41 between = 0.01 overall = 0.01	within = 0.39 between = 0.1 overall = 0.2	within = 0.51 between = 0.03 overall = 0.004	within = 0.38 between = 0.1 overall = 0.2	within = 0.43 between = 0.0001 overall = 0.03
F Statistic (4, 13)	14.34	19.72	47.29	23.59	16.1
F Statistic (P-value)	0.00	0.00	0.00	0.00	0.00
Sargan-Hansen statistic (P- value)	0.00	0.00	0.00	0.00	0.00
Modified Wald test (P- value)	0.00	0.00	0.00	0.00	0.00
Wooldridge Test (P-value)	0.00	0.00	0.00	0.00	0.00
Robust clustered standard errors, No. of Observations 448					

5.8 Conclusion

Transfers are an integral part of the federal relations in India and are a deliberate result of the Constitutional assignment of revenue and expenditure responsibilities between Central and state governments. In terms of devolution of transfers amongst states, total transfers were found to have an equalizing effect as the relation between transfers and income per capita was negative which meant that the low income states received greater transfers than the high income states. However the PC transfers did not have a

significant relationship with income per capita which means that in terms of distribution they might have not been truly equalizing. In terms of equalization of aggregate expenditure (which is the main objective of the transfers), the transfers have definitely helped in reducing disparities amongst the 14 non-special category states in India. However, as expected, FC transfers are found to have a more equalizing effect than PC in terms of smoothening out inter-state differences in per capita expenditure.

In totality though transfers have helped to reduce the disparities across these 14 states, the discouraging fact is that the same group of states (BJ, MPC, UPU, West Bengal and Odisha) have performed consistently below average for three decades in terms of aggregate expenditure and in terms of its important components. Odisha received the highest amount of transfers for three decades but it did not move to the above average category even once.

The Central transfers (PC and FC) transfers have also been found to have an adverse impact on fiscal deficit of the states. One of the reasons that was cited for this was the lack of coordination by the institutional bodies while determining the transfers to states. FC transfers were not only found to adversely affect fiscal deficit but an increase in fiscal deficit was also found to increase FC transfers to the states which confirms their gap-filling nature. This is because FC transfers were found to be endogenous in the regression with fiscal deficit as the dependent variable. Interestingly FC transfers were found to have a negative and significant relationship with political affiliation. The year in which there was the same party in the state and Centre there were lower FC transfers disbursed to those states. Statutory transfers have therefore played a role in offsetting political party affiliation in influencing the disbursement of transfers to the states. In contrast to earlier studies that have found transfers to negatively affect state tax effort, we found that there is a positive relation between transfers and state tax effort. Hence transfers do incentivise states to increase their revenue.

We now discuss issues pertaining to fiscal decentralization at the local level with special reference to Goa. Local government bodies are the closest to the people and are expected to better match the resources with the needs of the people. With Constitutional recognition granted to the local bodies they were expected to undertake greater responsibilities. Hence it is important to know the impact of decentralization at the local level on state income. This is specially important for Goa, being a small state with strong village level institutions and high income.

Chapter 6

Fiscal decentralization at the Third Tier Level of Governance with Special Reference to Goa

6.1 Introduction

This chapter analyses the impact of fiscal decentralization at the third tier level of governance with special reference to Goa. We begin with examining the impact of decentralization on state GSDP using panel level data for the third tier level of governance for the 14 non-special category states. In the second part of this chapter we examine the case of Goa in detail along with a taluka-wise analysis. This we believe would be the first such attempt for Goa. It has a high per capita income and is also ranked high on development and socio-economic indicators. We examine if the level of decentralization undertaken at the third tier level of governance has influenced Goa's GSDP. The disparities in per capita expenditure and per capita revenue across talukas in Goa are also analysed.

The 73rd and 74th Constitutional amendments for rural and urban areas respectively in 1992 granted Constitutional status to local bodies in India. It was compulsory for state governments to pass necessary legislation, as local governance is a state subject. Although the states amended their respective Panchayat and Municipality Acts by the deadline of April 1994, the extent of power and responsibilities to be passed on to local bodies was left entirely to the state governments who were expected to confer the local bodies with the requisite powers, responsibilities and authority. Schedule XI and Schedule XII list 29 and 18 subjects to be devolved to Panchayats and Urban Local Bodies respectively which is meant to incentivize states to empower local bodies. Among the powers that are mentioned in the schedules, health and education top the list. Hence through these Constitutional changes it was expected that the local bodies would stop being agents of the state governments and would be involved directly in

planning and implementing their own programmes of economic development and social justice (Asfaw et al., 2007).

6.2 State-wise Analysis of Expenditure and Revenue Components

In order to understand the extent of expenditure undertaken and revenue raised by the state local bodies, certain indicators have been constructed for the 14 non-special category states and Goa. Though it is difficult to draw out the qualitative features of decentralization using quantitative measures, however the share in raising revenue and undertaking expenditures provide valuable information about the Indian federal system (Rao, 2000).

The revenue and expenditure of the Urban Local Bodies (ULBs) and the Panchayat Raj Institutions (PRIs) taken together are presented in Table 6.1

States	Own tax	Own revenue	Total other revenue - assignment, devolution , grants in aid	Aggregate revenue	Capital expenditure	Aggregate expenditure
Andhra Pradesh	47.18	104.63	513.53	618.16	213.94	704.98
Bihar +Jharkhand	5.79	6.89	11.81	18.69	12.98	26.79
Goa	107.20	204.10	125.17	329.27	0.00	304.86
Gujarat	226.34	270.24	800.42	1070.66	117.30	1025.90
Haryana	34.05	94.84	123.89	210.20	5.49	215.68
Karnataka	85.60	97.64	900.08	997.71	162.71	934.52
Kerala	76.94	133.85	255.53	389.38	287.55	676.92
Madhya Pradesh +Chhattisgarh	75.92	108.85	162.78	271.63	53.38	313.89
Maharashtra	172.83	235.68	519.54	755.21	185.11	730.34
Odisha	6.42	14.78	67.28	82.05	12.70	81.76
Punjab	186.59	288.73	40.98	329.70	63.88	308.31
Rajasthan	7.87	32.67	389.32	421.99	157.84	395.28
Tamil Nadu	84.46	142.47	220.82	363.29	120.17	364.28
Uttar Pradesh +Uttarakhand	8.59	19.10	64.20	83.31	31.76	92.71
West Bengal	32.86	55.25	115.52	170.77	12.40	157.94
India (all states)	59.65	90.23	258.28	348.51	93.30	364.55
Author's compilation from Indiatats (Various Years)						

The data has been computed in the form of averages for the short time period of 1998-99 to 2002-03 due to lack of availability of comparable time series data for the third tier level of government for longer periods. Gujarat ranked the highest in own tax revenue per capita (Rs.226), followed by Punjab (Rs.187) and Maharashtra (Rs.173). Haryana which ranked high in terms of tax decentralization at the sub-national level performed poorly in terms of per capita own tax revenue of local bodies (Rs.34). The state with the least per capita tax revenue was BJ (Rs.6).

In terms of own revenue per capita Punjab ranked the highest (Rs.288) followed by Gujarat (Rs.270) and Maharashtra (Rs.236). Once again the state with the least own revenue per capita was BJ (Rs.7). In terms of grants and other transfers, the state that received highest transfers per capita was Karnataka (Rs.900), followed by Gujarat (Rs.800) and Maharashtra (Rs.520). The state with the least transfers was BJ at Rs.12 per capita. Though Punjab performs well in per capita own revenue collection it does not score very high on aggregate revenue per capita due to very small transfers. The top five states with the highest aggregate revenue per capita were Gujarat (Rs.1071) followed by Karnataka (Rs.900), Maharashtra (Rs.755), Andhra Pradesh (Rs.618) and Rajasthan (Rs.421). Karnataka does not top states in terms of own revenue collection but it is the state with high aggregate revenue per capita due to high amounts of transfers.

In terms of capital expenditure per capita, Kerala (Rs.288) was highest, followed by Andhra Pradesh (Rs.214) Maharashtra (Rs.185), Karnataka (Rs.163) and Rajasthan (Rs.158). Goa with nil capital expenditure was the lowest followed by BJ (Rs.27). The states with the highest aggregate per capita expenditure were Gujarat (Rs. 1026) followed by Karnataka (Rs. 935), Maharashtra (Rs. 730), Andhra Pradesh (Rs. 704) and Kerala (Rs.677).

The states which suffered a deficit during this period were Andhra Pradesh, BJ, Haryana, UPU, Kerala and MPC. This goes against the rule for efficient implementation of a decentralized system of government that requires functional assignments to be backed by adequate finances (Bahl, 2002; Shah, 1994). Assigning requisite revenue powers and ensuring their effective use, therefore, is essential to ensure efficiency and accountability in the provision of local services (Rao et al., 2011). Table 6.2 provides details of the expenditure and revenue components of the local bodies.

States	Total transfers as (%) of aggregate revenue	Own revenue as a (%) of aggregate revenue	Capital expenditure as a (%) of aggregate expenditure
Andhra Pradesh	83	17	31
Bihar +Jharkhand	54	46	35
Goa	35	65	0
Gujarat	75	25	11
Haryana	58	47	3
Karnataka	90	10	18
Kerala	66	34	42
Madhya Pradesh +Chhattisgarh	60	40	17
Maharashtra	69	31	25
Odisha	82	18	15
Punjab	12	88	20
Rajasthan	92	8	40
Tamil Nadu	60	40	33
Uttar Pradesh +Uttarakhand	76	24	34
West Bengal	66	34	8
India (all states)	74	26	26
Author's compilation from Indiatats (Various Years)			

Dependency on transfers as a percentage of total revenue was very high for most of the states (Table 6.2). The state with the highest dependency on transfers was Rajasthan (92 percent) followed by Karnataka (90 percent), Andhra Pradesh (83 percent), Odisha (82 percent) and Gujarat (75 percent). Punjab receives only 12 percent of its revenue in the

form of transfers. This suggests that though Constitutional reforms have been undertaken and greater responsibilities have been transferred to the local bodies however the local authorities do not have the powers to generate greater revenue or do not exploit their revenue base to the fullest.

In terms of capital expenditure the high income states like Gujarat, Haryana and Punjab spend a comparatively smaller percentage of their expenditure for capital investments as compared to states like UPU and BJ which are low income states but rank relatively higher in terms of spending a greater portion of expenditure as capital investments. In the next section we focus on Rural Local Bodies.

6.2.1 Panchayat Raj Institutions (PRIs)

The average own tax revenue and own revenue for PRI's of the 14 large states and Goa was Rs.18 and Rs.33 per capita which is higher than the all India average but is still extremely low. This suggests that Panchayats do not really have any autonomy to raise their own revenue (Table 6.3). Most of the revenue of Panchayats was through transfers, and grants from the state and Central government. On an average the per capita transfers to PRI's of these 15 states was Rs.343. The average aggregate revenue of local bodies for these states was Rs.376 and the average aggregate expenditure was Rs.380 which suggests that on average PRIs of these states spend more than the revenue they have. The revenue and expenditure components of the Panchayats of BJ were extremely low. Its aggregate revenue per capita was Rs.10 and aggregate expenditure per capita was Rs.14. The states which exhibited a deficit were Andhra Pradesh, BJ, Kerala and MPC.

States	Own tax	Own revenue	Total other revenue	Aggregate revenue	Capital expenditure	Aggregate expenditure
Andhra Pradesh	13	27	644	672	251	770
Bihar+Jharkhand	0	1	9	10	8	14
Goa	80	109	133	242	0	242
Gujarat	21	24	1138	1162	27	1038
Haryana	5	46	136	182	0	182
Karnataka	17	17	1204	1221	156	1160
Kerala	45	87	288	374	300	674
Madhya Pradesh +Chhattisgarh	22	33	103	136	33	170
Maharashtra	42	62	751	812	147	700
Odisha	0	3	51	54	14	53
Punjab	1	49	34	83	0	83
Rajasthan	1	8	390	398	168	370
Tamil Nadu	13	17	167	184	43	145
Uttar Pradesh +Uttarakhand	1	5	43	48	36	45
West Bengal	5	9	54	64	0	60
India (all states)	10	19	279	298	80	306
Author's compilations from India Stats (Various Years)						

The PRIs are heavily dependent on grants and transfers from Central and state governments (Table 6.4). 99 percent of revenue of PRIs in Karnataka comprise of transfers, this is followed by Rajasthan and Gujarat at 98 percent, Andhra Pradesh at 96 percent and the all-India average was 94 percent. Punjab and Goa receive comparatively lower amount of transfers. With respect to capital expenditure, four states do not spend any amount on capital development at the Panchayat level. These four states are Goa, Haryana, Punjab and West Bengal. UPU spends the highest percentage (78 percent) of its total expenditure on capital, followed by Rajasthan (46 percent), Kerala (44 percent) and Andhra Pradesh (33 percent). The all-India average of capital expenditure undertaken by local bodies was 26 percent only.

States	Own revenue as (%) of aggregate revenue	Grants as (%) of aggregate revenue	Capital expenditure as (%) of aggregate expenditure
Andhra Pradesh	4	96	33
Bihar +Jharkhand	25	75	26
Goa	52	48	0
Gujarat	2	98	2
Haryana	28	72	0
Karnataka	1	99	14
Kerala	23	77	44
Madhya Pradesh +Chhattisgarh	24	76	20
Maharashtra	8	92	21
Odisha	5	95	22
Punjab	60	40	0
Rajasthan	2	98	46
Tamil Nadu	10	90	30
Uttar Pradesh+Uttarakhand	10	90	78
West Bengal	18	82	0
India (all states)	7	94	26

Source: Author's compilations from India Stats (Various Years)

States	2003	2004	2005	2006	2007
Andhra Pradesh	50	57	62	66	83
Bihar +Jharkhand	0.03	0.03	0.04	0.67	0.97
Gujarat	21	38	26	31	42
Haryana	70	127	163	174	166
Karnataka	33	23	35	44	84
Kerala	92	104	122	126	106
Madhya Pradesh +Chhattisgarh	12	12	14	11	12
Maharashtra	124	105	92	98	107
Odisha	3	3	3.02	3.08	3.15
Punjab	69	93	92	107	28
Rajasthan	3	3	3	3	3
Tamil Nadu	56	68	73	83	80
Uttar Pradesh +Uttarakhand	5	6	6	6	6
West Bengal	9	11	12	16	0

Source: (Rao et al., 2011)

During 2003-07 we do not observe much improvement in the own revenue per capita of the PRIs (Table 6.5). States like UPU, BJ, Rajasthan, West Bengal and MPC raise very

little own revenue through PRIs. Kerala, Maharashtra and Haryana seem to be performing relatively better in terms of own revenue collection.

States	2003	2004	2005	2006	2007
Andhra Pradesh	254	281	335	320	430
Bihar +Jharkhand	15	3	42	48	36
Gujarat	1344	1512	1724	2015	2064
Haryana	146	213	383	418	566
Karnataka	1385	1449	2095	2442	2988
Kerala	778	883	1015	1109	1202
Madhya Pradesh +Chhattisgarh	136	243	374	696	955
Maharashtra	1594	1682	1892	2032	2212
Odisha	288	282	313	541	544
Punjab	199	271	393	685	138
Rajasthan	49	76	83	76	67
Tamil Nadu	733	859	880	1041	1325
Uttar Pradesh +Uttarakhand	135	150	209	155	180
West Bengal	152	193	328	338	508
Source: (Rao et al., 2011)					

A comparison of total revenue per capita (Table 6.6) and own revenue per capita (Table 6.5) of states shows that PRIs are still heavily dependent on transfers. In the next section we focus on ULB's.

6.2.2 Urban Local Bodies (ULBs)

	Own tax revenue	Own revenue	Other revenue	Aggregate revenue	Capital expenditure	Aggregate expenditure
Andhra Pradesh	140	316	154	470	110	524
Bihar+Jharkhand	44	48	29	78	49	116
Goa	135	302	116	418	0	367
Gujarat	583	698	221	918	274	1009
Haryana	109	221	95	316	19	306
Karnataka	224	260	300	560	177	492
Kerala	179	282	149	431	251	681
Madhya Pradesh +Chhattisgarh	242	342	348	691	116	759
Maharashtra	352	474	200	674	236	770
Odisha	43	85	160	245	5	245
Punjab	553	760	55	815	190	752
Rajasthan	31	113	387	500	122	479
Tamil Nadu	178	306	293	600	222	653
Uttar Pradesh +Uttarakhand	38	74	157	231	22	285
West Bengal	104	185	276	461	45	416
India (all states)	190	279	205	484	129	521
Author's compilations from Indiastats (Various Years)						

ULBs have exhibited greater ability to raise resources compared to PRIs (Table 6.7). On an average ULBs of these states included in our study had own tax revenue per capita at Rs.197 and own revenue per capita at Rs.297 which is much higher than that of the PRI's. However these states received comparatively lesser grants as compared to PRI's on an average at Rs.196. The average aggregate revenue per capita of ULB's of the 15 states (including Goa) was Rs.494 and the average aggregate expenditure per capita was Rs.523. Goa was the only state that did not undertake any capital expenditure at the ULB level. But other states too undertook very small expenditures on the capital account. The states which exhibited a deficit were Andhra Pradesh, BJ, Gujarat, MPC, Maharashtra, Kerala, UPU and West Bengal.

Table 6.8 provides a better understanding of the revenue and expenditure components of ULB's

Table 6.8: Components of Revenue and Expenditure of ULBs Average 1998-99 to 2002-03 (%)			
States	Own revenue as (%) of aggregate revenue	Other revenue as (%) of aggregate revenue	Capital expenditure as (%) of aggregate expenditure
Andhra Pradesh	67	33	21
Bihar+Jharkhand	63	37	36
Goa	73	27	0
Gujarat	76	24	27
Haryana	72	28	6
Karnataka	48	52	36
Kerala	66	34	36
Madhya Pradesh+Chhattisgar h	50	50	15
Maharashtra	69	31	30
Odisha	38	62	3
Punjab	93	7	25
Rajasthan	22	78	25
Tamil Nadu	51	49	34
Uttar Pradesh+Uttarakhand	38	62	8
West Bengal	41	59	11
India (all states)	58	42	25
Author's compilations from Indiastats (Various Years)			

Clearly ULB's of most states raise more than 50 percent of their own revenues (Table 6.8). Punjab raises 93 percent of its own revenue. The only states that raise less than 50 percent of own revenue were Odisha, Rajasthan, UPU and West Bengal. The ULB's spend a lower proportion of their total expenditure on capital as compared to PRIs. Though the states spent a smaller proportion on capital expenditure however in per capita terms they spent higher amounts on capital expenditure than the PRI's. States that undertook the highest percentage of capital expenditure were BJ, Karnataka and Kerala (36 percent) followed by Tamil Nadu (34 percent) and Maharashtra (30 percent).

6.3 Decentralization at the Local Level of Governance

We attempt to understand the extent of tax and expenditure decentralization that has been attained at the third tier level of governance by the 14 non-special category states in India. The impact of decentralization for Goa has been analysed separately in section 6.7 due to the availability of data for more recent years.

We start by defining the different terms widely used in this context. The following formulas have been used to measure various aspects of decentralization:

(a) Expenditure decentralization (ED) is defined as local aggregate expenditure per capita divided by the sum total of local aggregate expenditure per capita, state aggregate expenditure per capita and Central expenditure per capita (Equation 6.1). The state aggregate expenditure per capita is net of loans and advances of states to lower levels of government and transfers from the Central government to states. Here the local ED measure includes grants from the sub-national and Central government (as the local bodies are heavily dependent on the transfers from the higher level of governments). The formula used is as below:

$$ED = \frac{\text{Local bodies expenditure pc}}{\text{Local Bodies expenditure pc} + \text{State expenditure pc} + \text{Central expenditure pc}} \quad (6.1)$$

This formula draws on Qiao et al. (2008) but extends it to the three tier form of government.

(b) Tax Decentralization (TD) is measured as the ratio of the own tax revenue (OTR) of the local bodies per capita and the sum total of own tax revenue of local bodies per capita plus state and Central own tax revenue per capita. The tax decentralization measure too extends the measure of Qiao et al. (2008) to the three tier form of government. The formula used is as below:

$$TD = \frac{\text{Own tax revenue of local Bodies pc}}{\text{State Own Tax Revenue pc} + \text{Own tax revenue of Local Bodies pc} + \text{Central tax revenue pc}} \quad (6.2)$$

(c) Autonomy is defined as the ratio of local tax decentralization to local expenditure decentralization. This is based on the measure of Oommen (2006).

$$Autonomy = \frac{TD \text{ of Local Bodies}}{ED \text{ of Local bodies}} \quad (6.3)$$

A state expenditure decentralization (SED) indicator has also been constructed to compare the level decentralization at the sub-national level with local level. This measure differs from the decentralization measure constructed in chapter four as it considers decentralization at the third tier level of governance. Here the state expenditure per capita is net of compensation and assignments to local bodies as well as transfers from the Central government to the states. The formula for state ED is as follows:

$$SED = \frac{\text{State expenditure pc}}{\text{Local bodies expenditure pc} + \text{state expenditure pc} + \text{Central expenditure pc}} \quad (6.4)$$

The various decentralization indicators for the 14 non-special category states have been compiled in Table 6.9.

Table 6.9: Decentralization indicators at the Third Tier Level of Governance (Average 1998-99 to 2002-03)				
	Local ED	State ED	Local TD	Local Autonomy
Andhra Pradesh	0.102	0.484	0.014	0.141
Bihar+Jharkhand	0.006	0.362	0.003	0.607
Gujarat	0.123	0.537	0.061	0.490
Haryana	0.029	0.589	0.009	0.333
Karnataka	0.132	0.473	0.024	0.187
Kerala	0.092	0.529	0.021	0.231
Madhya Pradesh +Chhattisgarh	0.059	0.412	0.029	0.487
Maharashtra	0.097	0.529	0.044	0.454
Odisha	0.015	0.473	0.003	0.194
Punjab	0.036	0.637	0.049	1.368
Rajasthan	0.065	0.469	0.003	0.048
Tamil Nadu	0.054	0.525	0.022	0.408
Uttar Pradesh+ Uttarakhand	0.019	0.405	0.004	0.189
West Bengal	0.028	0.480	0.013	0.481
Source: Author's compilations from Indiatats (Various Years)				

Similar to the decentralization at the state level, the degree of decentralization varies

greatly at the third tier level of governance. The degree of decentralization at the local level depends entirely on the state government as the devolution of responsibilities to the local government is a state matter. The states with the highest level of ED were Karnataka (0.13) followed by Gujarat (0.12), Andhra Pradesh (0.10), Maharashtra (0.097) and Kerala (0.092). However Local Bodies in all these states receive 65 percent and more of their revenue from transfers by state and central government. This process has been termed as de-concentration rather than decentralization (Rao, 2001). Not surprisingly BJ (0.01), Odisha and UPU (0.02) are the states with the least ED. High income states like Haryana (0.03) and Punjab (0.04) perform badly in ED at the local level.

Local governments definitely enjoy greater ED as compared to TD. The highest TD is observed in Gujarat (0.06) followed by Punjab (0.05), Maharashtra (0.04) and MPC (0.03). The state with the highest autonomy was BJ (0.6), Gujarat and MPC (0.49) and West Bengal (0.48). Even though these states rank high in autonomy they rank low in terms of their per capita expenditure and per capita revenue. On the other hand states which rank comparatively high in terms of ED are also states which receive larger part of their funds in the form of transfers. The states with the highest SED for the time period 1998-99 to 2002-03 were Punjab (0.64), Haryana (0.59) and Gujarat (0.54). Punjab and Haryana have high SED but perform poorly in terms of ED indicators at local level. The question we turn to now is whether decentralization has any impact on growth.

6.4 Empirical Evidence

There is evidence to suggest that decentralization would affect economic growth. Kalirajan & Otsuka (2012) used a panel data regression analysis to study the impact of rural decentralization on agricultural GSDP for 25 States in India for the time period 1993-94 to 1999-00. They found that decentralization of rural local bodies has a

positive impact on agricultural GSDP. Apart from this study there isn't much literature that has empirically tested the link between decentralization and growth in India. Besides decentralization, we have included some other control variables that are expected to influence GSDP. We expect that GSDP is affected by decentralization, capital expenditure, Central transfers, Medical expenditure and education expenditure. The use of medical and education expenditure that come under the purview of social expenditure as well as capital expenditure, as predictors of GSDP has already been explained in Chapter 4.

Central transfers have been used as predictor variable. Transfers are meant to equalize state incomes and to compensate states with less revenue capacity or greater expenditure needs. The transfers are therefore expected to provide a minimum level of merit goods having strong externalities. Hence we expect that transfers will have a positive influence on state GSDP (Rao, 2015).

We therefore test the impact of rural and urban decentralization on lnGSDP and add to this literature.

We start by examining the correlation between the various explanatory variables to be used in the regression analysis.

Table 6.10: Correlation Matrix									
	Local ED	State ED	Local TD	Local Autonomy	lnCentral grants	ln Central total transfers	ln State Med	lnState edu	lnState Cap exp
Local ED	1								
State ED	0.21	1.00							
Local TD	0.57*	0.53*	1.00						
Local Autonomy	-0.24	0.39*	0.53*	1.00					
lnCentral grants	0.1	0.15	-0.15	-0.28	1				
lnCentral Total transfers	-0.14	-0.45*	-0.47*	-0.42*	0.69*	1			
ln State med	0.47*	0.82*	0.54*	-0.26	0.28	-0.19	1		
lnState edu	0.42*	0.82*	0.5*	-0.16	0.15	-0.32*	0.86*	1	
lnstate Capital exp	0.44*	0.52*	0.38*	-0.04	0.27	-0.17	0.37*	0.46	1

*Correlation at one percent level of significance

There is a high correlation between TD and ED at the local level (0.57) (Table 6.10). Similarly there is a high correlation between TD and local autonomy (0.53) and hence the author has undertaken separate regressions using all the above mentioned variables as they cover different aspects of decentralization. Besides the decentralization variables there is multicollinearity between some of the independent variables mentioned above and hence separate regressions have been undertaken as these variables are considered to be important predictors of GSDP.

Panel data regressions have been undertaken using equations 6.5 to 6.7 for 14 non special category states for the time period 1998-99 to-2002-03.

$$\ln GSDP_{it} = \beta_0 + \beta_1 \text{Local ED}_{it} + \beta_2 \text{State ED}_{it} + \beta_3 \text{Local Autonomy}_{it} + \beta_4 \ln \text{Central transfers}_{it} + e_{it} \quad (6.5)$$

$$\ln GSDP_{it} = \beta_0 + \beta_1 \text{Local ED}_{it} + \beta_2 \text{Local Autonomy}_{it} + \beta_3 \ln \text{Central transfers}_{it} + \beta_4 \text{State Med exp}_{it} + \beta_5 \ln \text{State cap exp}_{it} + e_{it} \quad (6.6)$$

$$\ln GSDP_{it} = \beta_0 + \beta_1 \text{Local ED}_{it} + \beta_2 \ln \text{State cap exp}_{it} + \beta_3 \ln \text{Central grants}_{it} + \beta_4 \text{State Edu exp}_{it} + e_{it} \quad (6.7)$$

$$\ln GSDP_{it} = \beta_0 + \beta_1 Local\ TD_{it} + \beta_2 \ln State\ cap\ exp_{it} + \beta_3 \ln Central\ grants_{it} + \beta_4 \ln State\ Edu\ exp_{it} + e_{it} \quad (6.8)$$

where “i” stands for state and “t” stands for time

lnGSDP: Natural log of Gross State Domestic Product per capita

Local ED : Expenditure decentralization at the third tier level of governance.

State ED: Expenditure decentralization at the state level

Local TD: Tax decentralization at the third tier level of governance

Local Autonomy: Autonomy at the third tier level of governance

lnState Cap exp : Natural log of the State capital expenditure per capita

lnCentral grants : Natural log of the aggregate Central grants to States per capita

lnCentral transfers: Natural log of the aggregate Central transfers to states.

lnState edu: Natural log of state educational expenditure per capita

lnState med: Natural log of the state medical expenditure per capita.

e:error term

All the above variables have been expressed in current prices.

The results are presented in Table 6.11. The Breusch Pagan Multiplier test indicated that a random effects model is preferred to a pooled regression model. Since robust standard errors were used the Sargan Hansen test was used instead of the Hausman test to choose between fixed effects and random effects model. The Sargan Hansen statistic shows that the fixed effects model was more appropriate compared to the random effects model.

Table 6.11:Fixed-effects (within) regression) Dependent Variable: lnGSDPpc (1998-99-2002-03)			
Independent Variable	1	2	3
Local ED	-2.9**	-3.31***	- 3.01***
State ED	0.67		
lnCentral transfers	0.35***	0.15***	0.14***
Local Autonomy	-1.12	-0.06	
lnState Cap exp		-0.5	-0.22
lnMed expenditure		0.52***	
lnedu expenditure			0.4***
Constant	7.45***	6.9***	6.8***
Adjusted R-squared	within = 0.57 between = 0.35 overall = 0.16	within = 0.64 between = 0.2 overall = 0.22	within = 0.62 between = 0.1 overall = 0.1
F statistic	16.1	45.77	22.19
F(P-value)	0	0	0
Sargan-Hansen statistic 18.91 Chi-sq(3) (P-value)	0.0003	0.00	0.00
Robust standard errors, Significance level *** (1percent) ** (5 percent) *(10 percent). No. of observations (75)			

The results indicate that local ED for the time period 1998-99 to 2002-03 had a negative impact on state economic growth. The coefficient suggests that a one unit increase in decentralization at the local level leads to a 3 percent decrease in lnGSDP per capita. This finding is contrary to the expectations of some economists that ED at the local level has a positive impact on income due to proximity of the authorities to the local people. However if managers in the local administration do not have proper training then it may have adverse effects (World Bank, 2000a). Besides, the local governments in most states have very limited spending powers. Most state governments have handed over only a few of the functions stated in the eleventh and twelfth schedule of the Constitution. Many authors have argued that since state governments have not really devolved the functions, a proper impact analysis of local governments is not feasible (Rao et al., 2011). In some cases the services provided by the municipal bodies were of

poor standard. The state governments as a consequence created a number of independent agencies like housing boards, water supply authorities, and various improvement trusts to provide minimum services to the local people (Rao, 2000). Our results show that state ED is not significant and this is probably because SED has an impact of GSDP with a lag (fourth and fifth lag). The local autonomy indicator is negative but not significant. By devolving the functions in form of schemes, Panchayats lack the autonomy and flexibility essential to undertake expenditure programs effectively. Rao et al., (2004) found that from the total transfers to rural local governments in Karnataka in 2000-01, they had proper autonomy and flexibility in spending for only 3.2 percent of the funds. A healthy system of fiscal decentralization can be established only when there is a clear linkage between expenditure and revenue functions (Rao et al., 2011). Central transfers, medical and education expenditure were found to have significant and positive impact on GSDP. Capital expenditure was not significant for this time period.

The results of the panel regression using equation 6.8 are presented in Table 6.12. The FE model was chosen over RE and pooled regression since the Breusch Pagan Lagrange Multiplier and the Sargan- Hansen statistic suggested this (Table 6.12).

Table 6.12: Fixed-effects (within) Regression, Dependent Variable: ln GSDPpc 1998-99 to 2002 -03	
Independent Variable	Coefficient
Local TD	-3.52
lnCentral grants	0.16***
Instate capital exp	-0.02
Inedu exp	0.38***
Constant	9.48***
Adjusted R-squared	within = 0.58 between = 0.24 overall = 0.25
F (P-value)	0.00
Sargan-Hansen statistic 33.392 Chi-sq(3) (P-value)	0.00
Robust standard errors, Significance level *** (1 percent) ** (5 percent) * (10 percent)	
No. of observations (75)	

Local TD though negative had no significant impact on income. The World Bank (2000a) study also found that the tax base was too small to generate sufficient revenue. Another problem is the lack of willingness by the local authorities to collect taxes. A study by the World Bank (2000a) on rural decentralization found that the problem common to some states including Andhra Pradesh, Karnataka, MPC and Rajasthan was that many panchayats did not impose and collect taxes even though they were given the authority as it was unpopular with their constituents.

Another problem faced by PRIs was the inadequate administrative machinery and lack of trained staff for tax collection World Bank (2000a). This reiterates the fact that the decentralization at the local level requires greater training of the manpower and greater accountability measures in place.

A panel data study of 17 major states in India for the years 1999 and 2000 found that the proportion of tax bases devolved to states increases Central block grants significantly. This may be because those state governments that devolve more tax bases are also devolving more block grants. Such a move could also hamper incentives to raise taxes. This implies that it is not the lack of tax bases that reduces revenue, but lack of willingness to impose taxes (Jha et al., 2015). In order to check the link between grants and tax we used a panel fixed effects regression model using equation 6.9 for 14 major states from 1998-99 to 2002-03. Grants are expected to depend on TD and autonomy.

$$Grants_{it} = \beta_0 + \beta_1 TD_{it} + \beta_2 Autonomy_{it} + e_{it} \quad (6.9)$$

The results are presented in Table 6.13. The FE model was chosen over RE and pooled regression since the Breusch Pagan Lagrange Multiplier and the Sargan- Hansen statistic suggested this. We find that TD coefficient has a positive sign but is insignificant in terms of its impact on grants per capita at the local level. However,

unlike the study mentioned above, we have not separated the grants into block, conditional or tied grants. Autonomy as expected is found to have a significant negative influence on grants per capita (see Table 6.13).

Table 6.13: Fixed-Effects (within) Regression, Dependent Variable: LN Grants Per Capita 1998-99 to 2002-03	
Independent Variable	Coefficient
Local TD	7.4
Local Autonomy	-2.1***
Constant	5.8 ***
Adjusted R-squared	within = 0.5 between = 0.34 overall = 0.35
F (P-value)	0.00
Sargan-Hansen statistic 14.353 Chi-sq(2) (P-value)	0.001
Robust standard errors Significance level ***(1percent) **(5 percent) *(10 percent) . No. of observations (75)	

We now turn to a discussion about Goa's local government bodies. Goa is the richest state in the country in terms of per capita income. It is also a small state with a long history of local governance.

6.5 Analysis of Decentralization in Goa at Third Tier Level of

Governance

6.5.1 Urban Local Bodies

Goa's urban areas are under the administration of the Municipal Corporation of the City of Panaji (CCP) and 13 Municipal Councils (MCs). The Goa Municipalities Act, 1968 governs the functioning of the municipalities in the state and was amended in 1994 due to the 74th Constitutional amendment. The only Corporation (CCP) in Goa is governed by the City of Panaji Corporation Act, 2002 (CAG, 2010).

Although the Twelfth Schedule (Article 243W) of the Constitution envisioned handing over of 18 functions to the Urban Local Bodies (ULBs) by Indian states however, the Goa Municipalities amendment Act (1993) released only 11 functions to the Municipal

councils (Table 6.14). Besides this, functions like Urban Poverty Alleviation and Solid Waste Management under Public Health and Sanitation that were not mentioned in the Goa Municipalities Act have also been given to ULBs. Of the 11 functions that were planned to be devolved to ULBs, only eight functions and one activity in one function have actually been transferred as of March 2011 (Table 6.14)

Table 6.14: Devolution of Functions as per the Goa Municipalities Act, 1968			
Sr. No	Function listed to be devolved as per the 74th Amendment	Functions decided to be devolved : Goa Municipalities Act, 1968	Functions actually devolved
1	Urban and town planning	Yes	No
2	Solid waste management and sanitation, Public health, conservancy	No	Only management of solid waste
3	Social and economic planning for development purposes	No	No
4	Registration of births and deaths and Maintaining records of other vital statistics	Yes	Yes
5	Supply of water for commercial, industrial and domestic use	No	No
6	Improvement and upgrading of Slums	Yes	Yes
7	Fire Service	No	No
8	slaughter house and tanneries regulation	Yes	Yes
9	Protection the weaker and disadvantaged sections of society.	No	No
10	Protection of animals against cruelty and maintenance of cattle pounds and	Yes	Yes
11	Provision of public urban facilities like parks and playgrounds.	Yes	Yes
12	Bridges and Roads	Yes	Municipal councils maintain only internal roads
13	Electric crematorium, burial and cremation grounds	Yes	Yes
14	Poverty alleviation in urban areas	No	Yes
15	Protection of environment and forests and promotion of ecological issues.	Yes	No
16	Public facilities like public conveniences and street lights	Yes	Yes
17	Regulation regarding construction of Buildings and land use	Yes	No
18	Catering to education and cultural needs and other aesthetic matters.	No	No
Source: (CAG, 2010)			

Prior to the constitutional amendment ULBS in Goa had been traditionally looking after the construction of internal roads, burial grounds, registration of births and deaths, street lighting etc. Hence the functions transferred under the 74th amendment to the ULBs are of very little importance. Planning which is an essential function has not been devolved to the ULBs. This defeats the main objective of decentralized planning. In order to have a better understanding of the spending activities of the ULBs, its expenditure components have been compiled in Table 6.15

Table 6.15: Expenditure Components of ULB's Goa , 2008-2012 (Rs. Lakh)						
Sr. No	Components	2008-09	2009-10	2010-11	2011-12	2012-13
1	General administration	1742 (32)	2321(33)	2899 (34)	2222 (25)	5857 (53)
2	Public safety	326(6)	240 (3)	153(2)	93 (1)	91 (1)
3	Public Health Conveniences and Instructions (i to v)	2834 (53)	3636(52)	4435 (52)	5601(63)	3947 (36)
4	i)water safety	61	34.5	8	10	19
5	ii)drainage, Conservancy and sanitary	879(16)	1173 (17)	1467(17)	2142(24)	845(8)
6	iii)public garden	38	144.5	251	172	12
7	iv)public works	1843(34)	2275 (33)	2706(32)	3257(36)	2967(27)
8	v)public instruction	13	8	3	21	104
10	Miscellaneous(i to ii)	462	745	1028	1024	1079
11	i)repayments of loans and interest	34	22	10	2	330
12	ii)others	428	722.5	1017	1023	749
14	Total Expenditure	5364	6939.5	8515	8954	10974
Source: (GOG, Various Years) Note1: figures in parenthesis signify percentage to total expenditure.						

From 2008-09 to 2011-12 the expenditure on public health conveniences and instructions was the highest component of expenditure (over 50%) of the ULB's (Table 6.15). The second highest component of expenditure was undertaken on general administration (between 25 to 35%). However in 2012-13 there was a sudden increase

in the administration expenditure which now is about 53% and there was a drastic decline in the expenditure on public health conveniences and instructions to 36%. ULB's large expenditure on administration is a cause for concern and the ULB's need to undertake more productive and developmental expenditures.

6.5.2 Revenue Sources and Components of ULB's

The sources of revenue accruing to the municipalities can be classified into three categories that is own tax revenue, non-tax revenue and revenue from miscellaneous sources as stated in Table 6.16

Table 6.16: Tax and Non-Tax Revenue Sources of Municipalities in Goa		
Own tax revenue	Non tax revenue	Miscellaneous
Tax on vehicles and animals, octroi, special water tax, general sanitary tax, lighting and pilgrim tax, toll, property tax; sewage and drainage, tax; signboards, posters and hoarding tax; general water tax.	Land and building rent, cases on lands within municipal limits, income from tax transfer of house, revenue from secondary, technical, industrial education and medical institutions; sopo (income from market), revenue from lease of municipal blocks & shops, stables, veterinary dispensary, lease on lands, pay-parking within municipality area municipal hall, slaughter house, garden; fees from trade license and construction license; receipts under special acts comprising of cattle pound charges, crematorium and cemeteries fees, sanitation charges.	Copying and comparing fees, NOC's and certified copies etc., interest on delayed payment, income from sale of municipal vehicle, residence certificate, revenue from sale of tender forms, sale proceeds of old store, fines; revenue from municipal library, hearse van, night soil tanker, registrations of birth and death income under right to information act, provident from subscription, interest on municipal investments, receipts of security, deposits and few others
Source: (Mukhopadhyay & Chattopadhyay, 2014)		

Besides the above, ULBs receive grants from Central and respective state governments. However the Government of Goa has not laid down any criteria based on which funds are to be distributed to the ULBs (CAG, 2006). This may give room for political bargaining by the ULB's for greater grants.

We have compiled the various revenue sources that are available for Goa's ULBs (Table 6.17). Municipal rates and taxes comprise around 30 percent of the total revenue. Up to 2011-12 most of the revenue came from octroi and taxes on house and land. However in 2011-12 there was a huge drop in octroi collections and in 2012-13 contributions from sources other than octroi and taxes on houses and rent formed a major part of the revenue under the revenue component titled Municipal rates and taxes. Receipts from rents and fees have contributed on an average around 22% of total revenue for the time period 2008-09 to 2012-13.

Table 6.17: Component-wise break up of Revenue of ULB's, 2008-2012 (Rs. Lakh)						
Sr. No	Municipal rates and Taxes	2008-09	2009-10	2010-11	2011-12	2012-13
I	Total Municipal rates and Taxes(1+2+3)	1267 (33)	1988 (29)	3205 (30)	2613 (20)	4558 (33)
1	Octroi	320	533	1321	745	2536
2	Taxes on House and Land	804	1182	1353	1498	1653
3	Others	142	273	531	370	369
II	Total Receipts from(4+5+6+7+8)	906(24)	1391 (20)	1816 (17)	3102 (24)	3631 (26)
4	Realisation under special acts	8	13	24	33	129
5	Markets	151	197	286	329	324
6	Slaughter houses	3	1	2	3	2
7	Rent for houses and lands	257	353	465	417	472
8	Other fees & revenue	487	827	1039	2321	2704
III	Revenue from Other source(9+10+11+12+13) :	1634	3438	5835	7262	5748
9	Government grants	905	2879	4130	5368	3851
10	Interest on receipts	171	205	402	403	924
11	Miscellaneous	558	354	785	500	453
12	Security deposit/EMD/loans & advances	0	0	518	990	520
13	Total revenue	3806	6818	10856	12977	13937

Source: (GoG, Various Years) Note: figures in Parenthesis signify percentage to total revenue.

Since 1999-00 there has been a continuous increase in per capita expenditure and per capita revenue of ULB's (Table 6.18). The municipalities have experienced a surplus of funds throughout the period. From 2007-08 onwards the surplus has been continuously increasing. Either it means that funds are being under-utilized or there is no proper distribution of resources and funds to ULBs in Goa according to their needs and expenditure requirements. In the latter case it would result in rich Municipal Councils collecting excess resources and the poorer Municipalities suffering from lack of funds.

Table 6.18: Aggregate Revenue and Expenditure Per Capita of ULB's in Goa, 1998-99 to 2012-13 (Rs)			
Year	Expenditure per capita	Revenue per capita	Deficit(-)/Surplus(+)
1998 - 1999	240	308	68
1999 - 2000	335	361	26
2000 - 2001	379	407	28
2001 - 2002	413	498	85
2002 - 2003	457	499	42
2003 - 2004	418	836	418
2004 - 2005	465	485	20
2005 - 2006	497	518	21
2006 - 2007	526	614	88
2007 - 2008	555	580	25
2008 - 2009	642	816	174
2009 - 2010	747	997	250
2010 - 2011	964	1229	265
2011 - 2012	988	1431	443
2012 - 2013	1179	1498	319
Source:(GoG, Various Years)			

Own revenue forms a greater part of the share of revenue receipts of ULB's. On an average from 1998-99 to 2012-13, own revenue comprised about 69 percent and grants comprised around 30 percent of total revenue of ULBs in Goa (Table 6.19). While it's a positive achievement that ULB's are able to raise a major part of their own resources, however care should be taken in spending the resources more efficiently as there is a gap between the revenue per capita generated by ULB's and the expenditure per capita undertaken.

Year	Grants per capita	Grants as % of total revenue	Own revenue per capita	Own revenue % total revenue
1998 - 1999	65	21	243	79
1999 - 2000	74	21	287	80
2000 - 2001	87	22	319	78
2001 - 2002	194	39	304	61
2002 - 2003	155	31	344	69
2003 - 2004	152	18	685	82
2004 - 2005	125	26	360	74
2005 - 2006	118	23	399	77
2006 - 2007	249	41	365	59
2007 - 2008	252	43	328	57
2008 - 2009	344	42	471	58
2009 - 2010	329	33	669	67
2010 - 2011	468	38	762	62
2011 - 2012	592	41	839	59
2012 - 2013	414	28	1084	72

Source: (GoG, Various Years)

6.6 Panchayati Raj Institutions in Goa

The Rural local bodies in Goa are governed by the Goa, Daman & Diu Village Panchayat Regulation, 1962 under Article 240 of the Constitution of India. This was amended in 1994 to incorporate provisions of the 73rd Constitutional Amendment Act, 1992. This led to the establishment of a two tier Panchayat system of rural governance that is Village Panchayats (VPs) at the village level and Zilla Panchayats (ZPs) at the district level (CAG, 2006). The XIth Schedule of the Constitution of India listed 29 functions and responsibilities to be devolved to PRIs. The Schedules I and II of the Goa Panchayati Raj Act, 1994 listed 28 and 25 functions to be transferred to VPs and ZPs respectively. However, only the following 12 functions each have been devolved partly to the VPs and ZPs (Table 6.20).

Table 6.20: Devolution of Functions to Village Panchayats and Zilla Parishads		
Sr. No	Functions of VPs	Functions of ZPs
1	Agriculture including agricultural extension	Agriculture including agricultural extension
2	Development of Children and Women	Fisheries
3	Animal Husbandry, Dairy and Poultry	Watershed Management and Minor irrigation
4	Health and sanitation	Education (primary and secondary)
5	Drinking water	Cultural activities
6	Poverty Alleviation	Small scale industries
7	Education (primary and secondary)	Drinking water
8	Cultural activities	Poverty Alleviation
9	Maintenance of community assets	Women and Child development
10	Fisheries	Animal Husbandry, Dairy and Poultry
11	Social welfare	Health and sanitation
12	Preparation of annual plans and budget, maintenance of vital statistics, relief for natural calamities, dealing with encroachment, mobilizing voluntary labour, and community works	Social welfare
Source: (CAG, 2010)		

When we compare the revenue and expenditure of Zilla Parishads and VPs from 2003-04 to 2009-10, we find that the expenditure and revenue of the Zilla Parishads is minimal as compared to that of VPs (see Table 6.21).

Year	ZPs (Rs crore)				VPs (Rs crore)			
	Own Revenue	Grants in aid	Total Revenue	Exp	Own Revenue	Grants in aid	Total Revenue	Exp
2003-04	0.13	3.86	3.99	3.02	9.87	14.69	24.56	26.39
2004-05	0.46	6.37	6.83	1.48	9.01	18.11	27.12	27.81
2005-06	0.11	6.93	7.04	10.7	11.48	29.53	41.01	32.84
2006-07	0.12	7.4	7.52	8.1	16.61	32.46	49.07	55.23
2007-08	0.04	6.27	6.31	9.82	20.99	27.2	48.19	47.63
2008-09	0.1	9.88	9.98	9.33	24.78	34.18	58.96	47.45
2009-10	0.55	9.62	10.17	9.76	45.96	19.71	65.67	59.57

Source: (CAG, 2010)

Zilla Parishads have been excluded from the analysis as time series data for the same was not available. Even though some data on Zilla Parishads and VPs is provided by CAG (2010), there are discrepancies between the figures of the Directorate of Panchayats and CAG. Hence for this study the data provided by the Directorate of Panchayats was used as it is available for a larger time period. Henceforth all reference in this study to PRI's of Goa will be referring solely to VPs.

Sr. No	Components	2009-10	2010-11	2011-12	2012-13
1	Administration	1027(18)	1594(24)	1581(21)	1819(29)
2	Sanitation and Public Health	379(7)	336(5)	344(5)	425(7)
3	Public works	3042(55)	3621(54)	4244(57)	3107(49)
4	Planning and Development	46(1)	104(2)	75(1)	51(1)
5	Education & culture	75(1)	108(2)	171(2)	112(2)
6	Social Welfare	73(1)	79(1)	102(1)	101(2)
7	Miscellaneous	793(14)	874(13)	911(12)	768(12)
8	Total expenditure	5577	6720	7427	6382

Source: (GoG, Various Years) Figures in parenthesis refer to percentages to the total expenditure.

Expenditure on important areas like sanitation and public health, planning and development, education and culture and social welfare get a very small percentage in the total expenditure of VPs (Table 6.22). Expenditure on administration and miscellaneous expenditure is higher than all the areas mentioned above. However an encouraging fact is that PRIs spend close to 50 percent of their expenditure on public works. Their second highest expenditure was on administration.

Comparing the achievements with the functions assigned to VPs, it was found that some of the meaningful work was left out and which was under the jurisdiction of VPs (Table 6.23).

Table 6.23: Achievements of VPs, 2009-10 to 2012-13					
Sr. No	Components	2009-10	2010-11	2011-12	2012-13
1	Construction of village paths and roads in Kms/mts	52	229	247	88
2	Repair of village paths and roads in Kms/mts	35	24	51	25
3	Construction of motorable roads	21	82	48	35
4	Compost pit dug	170	15	39789	7
5	Trees Planted in (nos)	37948	4265	2940	1308
6	Repairs of school building	16	8	5	13
7	Drinking water wells constructed	34	22	17	38
8	Drinking water wells repaired	300	258	227	64
9	Construction of culverts	28	61	49	23
10	Construction of panchayat ghars	9	4	7	2
11	Foot bridges constructed	22	12	6	8
12	Construction of school building	4	0	1	0
13	Construction of gutter (mts)		300	300	0
14	Crematorium Constructed		1		0
15	Construction of steps (mts)		300		0
16	Toilets constructed		2		0
17	Dressing room		1		
18	Construction of drains/retention wall				11
Source:(GoG, Various Years)					

Functions and responsibilities transferred to VPs include agriculture, fisheries, social welfare, poverty alleviation programmes, women and child development etc. However

none of these relevant works have been undertaken by the VPs. We present the revenue sources to which Village Panchayats have access to (Table 6.24).

Table 6.24: Sources of Revenue of VPs	
Tax revenue	Non-tax revenue
House tax, lighting tax, bicycle tax, trade profession calling and employment tax, advertisement/hoarding tax, entertainment tax, tax on land not subject to agricultural assessment , drainage/ garbage tax, tax for supply of water for drinking and other purposes.	Fees for construction licenses, sale of goods in markets, melas, fairs and festivals, registration of birth and death, certified copies, octroi, registration of cattle brought for sale, grazing cattle on grazing grounds, extraction of sand, laterite stones and others, various certificates issued by Panchayat, sale of premises for transfer of house tax, licensing for hotels, shops etc. Construction permission of factories and installation of machinery, cattle pound, buses and taxis and autostands provided adequate facilities are provided for travelers, pilgrims of persons attending jatras and festivals provided necessary arrangements for water supply, health and sanitation are made, garbage collection, occupation of public landing places. Rent and Sale proceeds are obtained from sale of tender forms, number plates, garden produce, auction sale proceeds of stray cattle, rent for lease of premise shops , community hall, rent for hiring village \Panchayat goods vehicle.
Source: (Mukhopadhyay & Chattopadhyay, 2014)	

Besides the above mentioned sources, VPs also receive funds in the form of grants mainly from the state and Central governments. Grants are of various types as stated below (CAG, 2010):

- a) Matching grants linked to tax collection of previous year
- b) Grants in lieu of octroi
- c) Specific purpose grants
 - i) Salary grants/ establishment grants
 - ii) Grants for weaker Panchayats to establish
- d) Development Purpose Grants
 - i) From District Rural Development Agency

ii) Finance Commission grants and Loans from Government and banks.

Unlike the ULBs certain criteria had been laid down by the Government of Goa in November 1997 for sanctioning grants to Village Panchayats (VPs). This is in accordance to sub section (1) of section 160 of the Goa Panchayati Raj Act, 1994. According to the criteria based on the income of the VPs, grants would be sanctioned for undertaking of such works whose estimated cost does not surpass Rs.5 lakh. The eligibility criteria for devolution of grants to VPs was revised in August 2007 as stated below:

Table 6.25: Criteria for Devolution of Grants to VPs				
Sr. No	As per Notification , November 1997		As per Notification, August 2007	
1	Panchayats whose annual income is up to Rs. One lakh.	100 percent of the project cost	Panchayats whose annual income does not exceed Rs. Five lakh	100 percent of the project cost
2	Panchayats whose annual income is above Rs. One lakh but not exceeding Rs. Two lakh	75 percent of the project cost	Panchayats whose annual income is above Rs. five lakh but not exceeding Rs. seven lakh	75 percent of the project cost
3	Panchayats whose annual income is above Rs. Two lakh but not exceeding Rs. Five lakh	50 percent of the project cost	Panchayats whose annual income is above Rs. seven but not exceeding Rs. Ten lakh	50 percent of the project cost
4	Panchayats whose annual income is above Rs. Five lakh	No grants	Panchayats whose annual income is above Rs. ten lakh	No grants
Source: (CAG, 2010)				

We present the revenue and expenditure of VPs in per capita terms in Table 6.26

Year	Expenditure per capita	Revenue per capita	Deficit (-)/ Surplus (+)
1998 - 1999	150	150	0
1999 - 2000	158	158	0
2000 - 2001	198	198	0
2001 - 2002	309	309	0
2002 - 2003	425	447	22
2003 - 2004	405	440	35
2004 - 2005	435	485	51
2005 - 2006	463	523	61
2006 - 2007	899	914	15
2007 - 2008	791	801	9
2008 - 2009	800	953	153
2009 - 2010	967	1201	235
2010 - 2011	1191	1378	187
2011 - 2012	1346	1655	309
2012 - 2013	1184	1338	155

Source: (GoG, Various Years)

For most years there has been a surplus which has been continuously increasing since 2007-08, similar to that of ULB's (Table 6.27). This may be indicating underutilization of funds by VPs due to cash-flow problems.

Per Capita Grants to VP	Grants as (%) of revenue of VP	VP own revenue Per capita	VP own revenue as (%) of total revenue
43	29	107	71
51	32	107	68
85	43	113	57
198	64	110	36
327	73	121	27
288	66	152	34
345	71	141	29
231	44	121	23
471	51	444	49
452	56	349	44
491	51	462	49
611	51	592	49
732	53	647	47
1018	62	637	38
691	52	648	48

Source: (GoG, Various Years)

On an average grants comprise around 53 percent of total revenue of VPs and own revenue on an average comprises of 45 percent of the total revenue during the period 1998-99 to 2012 -13 (Table 6.27). Hence unlike the ULB's for VPs the grants form more than 50 percent of their total revenue.

6.7 Decentralization of Local Bodies in Goa

Two indicators of decentralization were constructed, the first indicator was constructed following equation 6.1. In the compilation of the decentralization values of local bodies, the expenditure and revenue of the Zilla Parishads were left out due to lack of time series data. The second indicator was a Revenue Decentralization (RD) variable which was constructed using equation 6.10

$$RD = \frac{\text{Own Revenue per capita of local bodies}}{\text{Own revenue per capita of States} + \text{Own revenue per capita of local bodies} + \text{Central revenue per capita}} \quad (6.10)$$

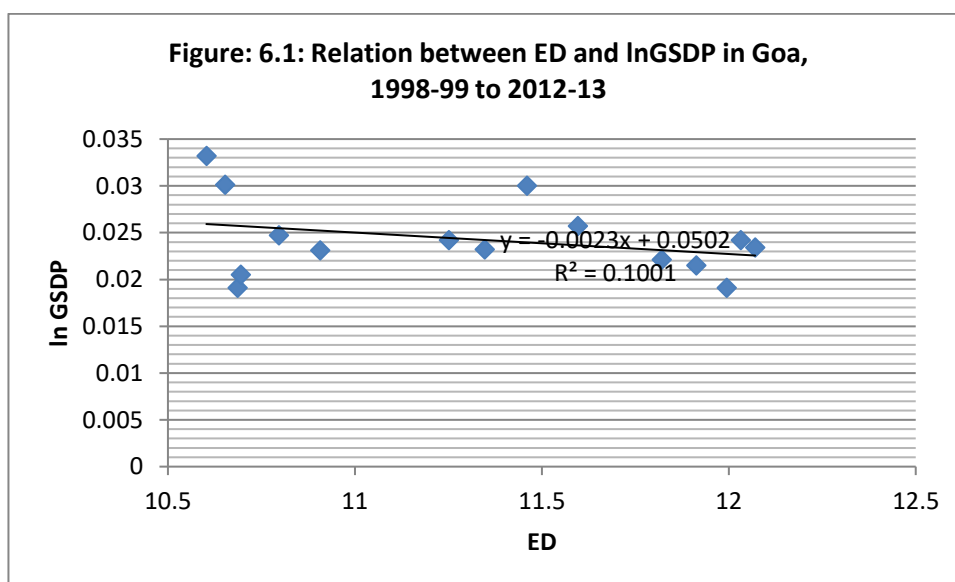
Year	Expenditure	Revenue
1998 - 1999	0.014	0.022
1999 - 2000	0.017	0.023
2000 - 2001	0.017	0.021
2001 - 2002	0.018	0.016
2002 - 2003	0.021	0.019
2003 - 2004	0.019	0.039
2004 - 2005	0.021	0.022
2005 - 2006	0.020	0.02
2006 - 2007	0.026	0.0248
2007 - 2008	0.022	0.02
2008 - 2009	0.019	0.022
2009 - 2010	0.019	0.026
2010 - 2011	0.022	0.023
2011 - 2012	0.020	0.022
2012 - 2013	0.017	0.025

Source: Author's compilations from GoG (Various Years)

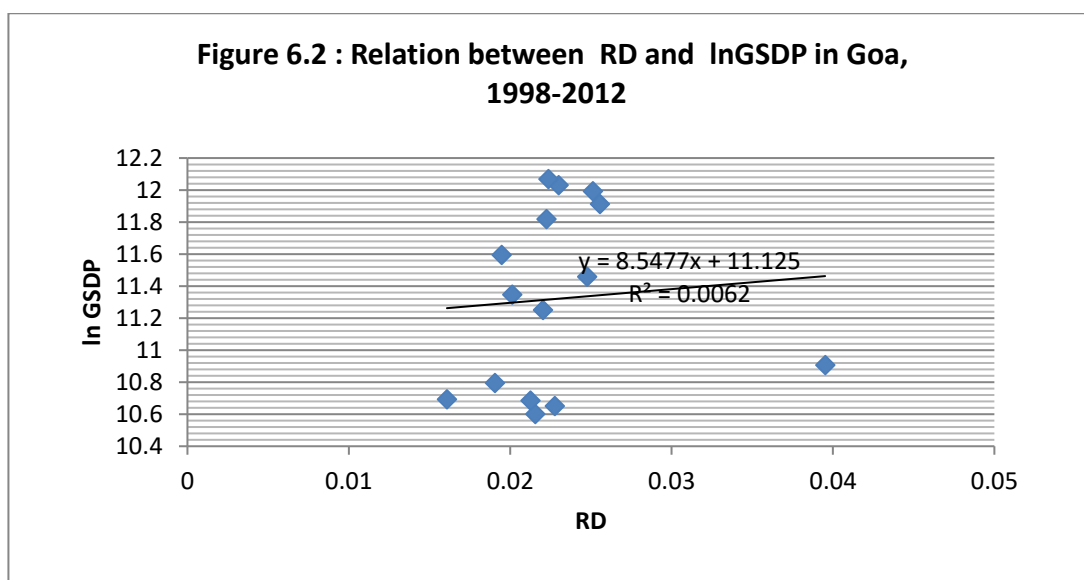
The extent of expenditure decentralization and revenue decentralization at local level in Goa seems to be more or less the same and is extremely low. In fact in 2012-13 it had reached a value of 0.017 which was slightly lower than the revenue decentralization value (0.025) (Table 6.28). Hence despite Goa achieving high per capita income there is very little decentralization taking place at the third tier level of government.

Two regressions using equation (6.11) below were undertaken for the time period 1998-99 to 2012-13 to understand the impact of decentralization (at the third tier level of governance) on state GSDP. The results show no significant impact of decentralization at the third tier of governance in Goa on GSDP (Figures 6.1 and 6.2).

$$\ln\text{GSDP}_t = \beta_0 + \beta_1\text{Decentralization}_t + e_t \quad (6.11)$$



Source: Author's compilations from GoG (Various Years) and MOSPI (Various Years)



Source: Author's compilations from GoG (Various Years) and MOSPI (Various Years)

Table 6.29: Per Capita Expenditure of Goa's State and Local Governments (Rs)

Year	Per capita state	Total per capita	Expenditure of Local
1998 - 1999	11209	192	1.72
1999 - 2000	12236	244	1.99
2000 - 2001	14664	286	1.95
2001 - 2002	17259	361	2.09
2002 - 2003	17427	442	2.53
2003 - 2004	17416	412	2.36
2004 - 2005	18169	451	2.48
2005 - 2006	20292	481	2.37
2006 - 2007	22283	690	3.09
2007 - 2008	24822	655	2.64
2008 - 2009	31278	707	2.26
2009 - 2010	38046	835	2.20
2010 - 2011	42458	1052	2.48
2011 - 2012	46889	1123	2.40
2012 - 2013	60637	1181	1.95

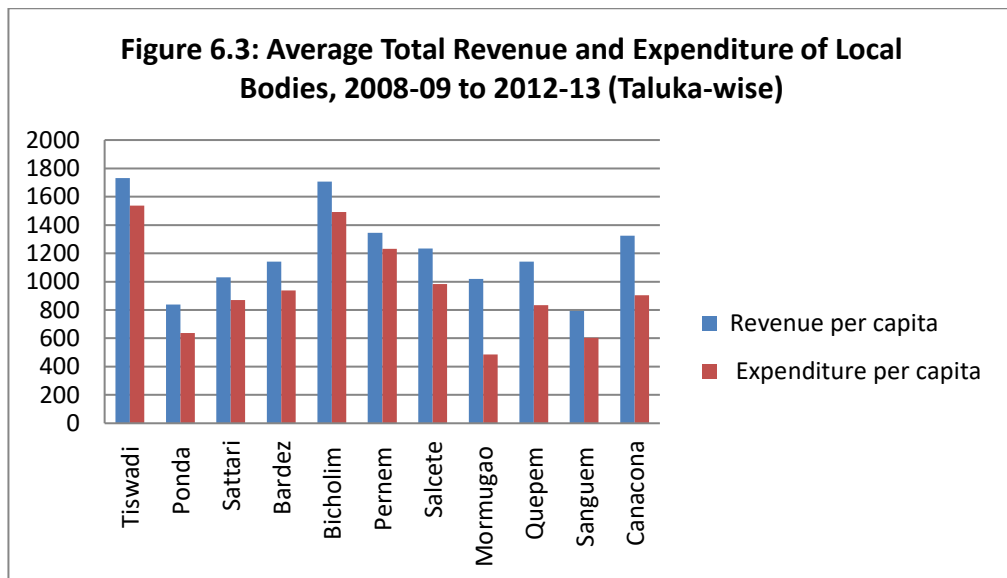
Source: Compiled by author from GoG, (Various Years)

Table 6.29: Per Capita Expenditure of Goa's State and Local Governments (Rs)			
Year	Per capita state expenditure minus grants to Local Bodies	Total per capita expenditure of Local bodies	Expenditure of Local Bodies as (%) of state expenditure
1998 - 1999	11209	385	3.43
1999 - 2000	12236	379	3.10
2000 - 2001	14664	286	1.95
2001 - 2002	17259	361	2.09
2002 - 2003	17427	441	2.53
2003 - 2004	17416	411	2.36
2004 - 2005	18169	451	2.48
2005 - 2006	20292	481	2.37
2006 - 2007	22283	689	3.09
2007 - 2008	24822	655	2.64
2008 - 2009	31278	707	2.26
2009 - 2010	38046	835	2.19
2010 - 2011	42458	1052	2.48
2011 - 2012	46889	1123	2.40
2012 - 2013	60637	1181	1.95
Source: Compiled by author from GoG, (Various Years)			

On an average for the time period 1998-99 to 2012-13, per capita expenditure of state net of loans and grants it disburses to local governments was Rs 26339 (Table 6.29). As compared to this the average per capita expenditure of the local bodies during the same time period is Rs. 629. The local bodies expenditure per capita includes expenditure funded by grants from the state and Centre. On an average total local expenditure has been around 2 percent of the state expenditure net of loans and advances to local bodies.

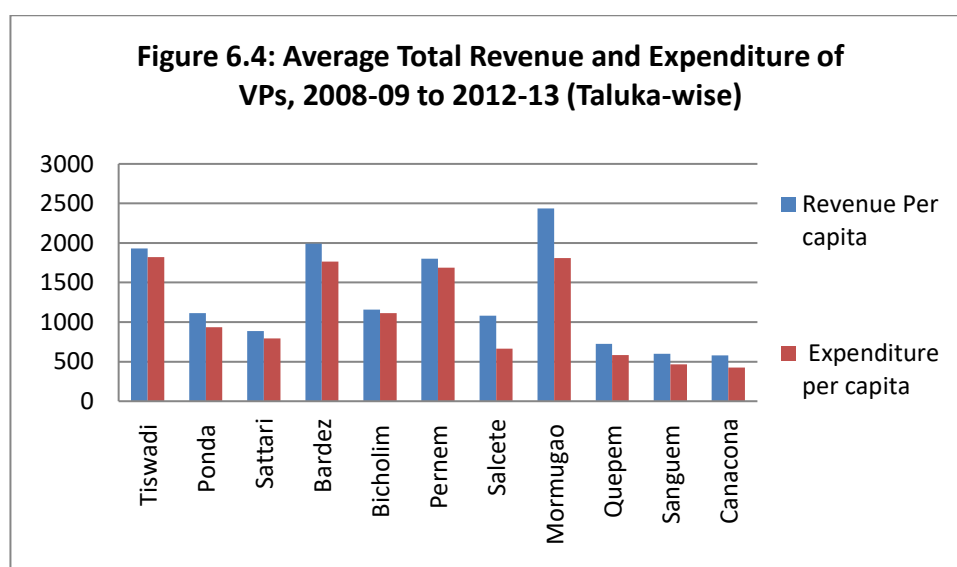
6.8 Taluka-wise Trends in Expenditure and Income

We will now look at the taluka level performance of ULBs & PRIs in Goa.



Source: Author's compilations from GoG (Various Years)

The newly created taluka Dharbandora has been left out from the analysis because it has been carved out of two talukas that is from Sanguem and Ponda in 2012. The data of ULBs and PRIs has been combined to look at overall performance. Tiswadi has the highest revenue per capita (Rs. 1731) and highest expenditure per capita (Rs.1538). It is closely followed by Bicholim with a per capita revenue of Rs. 1706 and expenditure per capita Rs.1491. All the talukas have per capita revenue greater than per capita expenditure as has been noted earlier. Mormugao oddly has one of the least expenditure per capita (Rs.486) and there is a huge gap between its expenditure per capita and revenue per capita which is at Rs.1020 (Figure 6.3).



Author's compilations from GoG (Various Years)

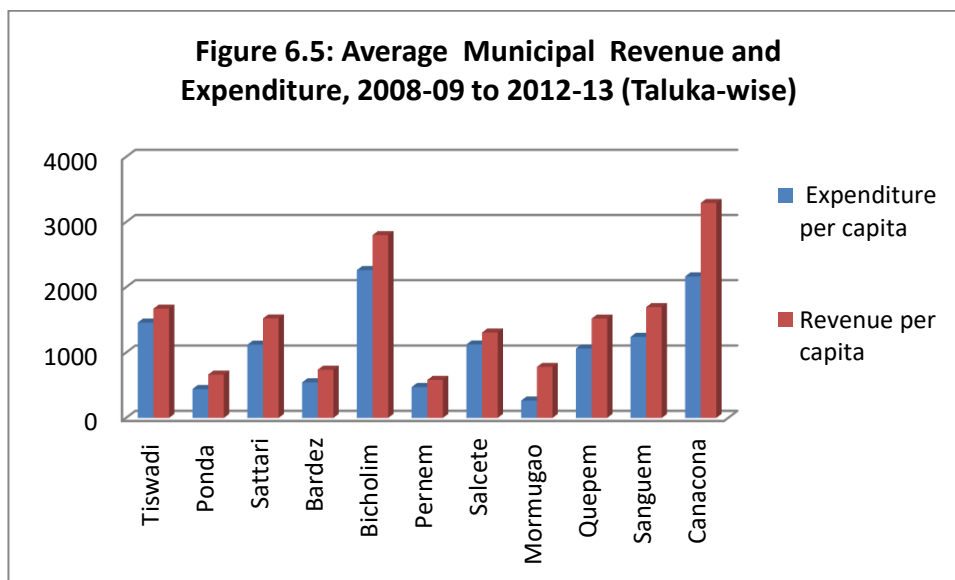
If we focus on the PRIs, average revenue per capita of VPs is highest for Mormugao at Rs. 2438 and again there is a big gap relative to its per capita expenditure which is at Rs.1809 per capita (Figure 6.4). For Salcete too there is a big gap in per capita revenue at Rs.1080 and the per capita expenditure at Rs. 665. The taluka with the second highest revenue per capita is Bardez at Rs.1993 and expenditure per capita at Rs.1765. Although Tiswadi has a per capita income that is slightly lower than that of Bardez at Rs.1932, its per capita expenditure is higher than that of Bardez taluka at Rs.1822. All the talukas have incomes that are higher than the expenditures in per capita terms. This has been discussed earlier.

	2007-08	2008-09	2009-10	2010-11	2011-12
Tiswadi	-30.06	40.43	130.53	-8.04	-8.02
Ponda	72.98	137.91	48.8	33.84	45.77
Sattari	-10.41	4.69	45.04	44.31	134.6
Bardez	45	-36.04	109.51	229.4	357.92
Bicholim	-1.28	68.21	203.09	136.61	-134.26
Pernem	140.49	72.68	-10.22	2.57	250.75
Salcete	232.81	360.02	336	324	405.58
Mormugao	187.38	61.9	350.16	49.69	125.37
Quepem	17.62	40.14	19.55	40.15	139.26
Sanguem	57.46	109.97	115.76	84.23	70.55
Canancona	26.71	41.8	4.73	42.05	41.85

Author's compilations from GoG (Various Years)

If we examine the balance of VPs, on very few occasions the talukas have experienced a deficit which is a desirable thing. But the large surplus of VPs is disquieting given the task allocated to it (Table 6.30).

We now turn to ULBs and their financial analysis.



Author's compilations from GoG (Various Years)

Like their rural counterparts ULB's have a higher revenue per capita as compared to the expenditure. Canacona has the highest Municipal revenue per capita (Rs.3292), however its per capita expenditure is Rs.2165. The second highest is Bicholim which has a per capita revenue of Rs.2798 and per capita expenditure that is not too far at Rs.2263. Sanguem is the third highest in per capita revenue at R.1696 and per capita expenditure at Rs.1241. Tiswadi is in fourth place with revenue per capita at Rs.1672 and expenditure per capita at Rs.1459. Mormugao has comparatively less municipal revenue (Rs.781) and expenditure (Rs.265) per capita (Figure 6.5).

	Tiswadi	Bardez	Pernem	Bicholim	Sattar i	Ponda	Sanguem	Canana cona	Quepem	Salcete	Mormugao
I)Municipal rates and Taxes	1257 (47)	673 (33)	5(4)	422(19)	54(26)	356 (46)	91 (51)	214(32)	367(37)	460 (18)	660(43)
(i)Octroi	315	345	0	330	45	277	90	170	323	140	500
(ii)Taxes on House and Land	802	212	5	41	7	67	1	23	26	317	153
(iii)Others	140	116	0	51	2	12	0	21	18	3	7
II)Receipts from	523 (20)	1055 (51)	17 (15)	220 (10)	23 (11)	225 (29)	8 (4)	113 (17)	171 (17)	688 (27)	593 (39)
(i)Realisation under special acts	129	0	0	0.04	0.01	0	0	0	0	0	0
(ii)Markets	17	85	3	15	3	42	1	29	47	57	31
(iii)Slaughter houses	0	0	1	0.4	0.8	0	0	0	0	0	0
(iv)Rent for houses and lands	67	162	1	49	6	16	7	21	25	35	83
(v)Other fees & revenue	310	808	12	156	13	167	0	63	99	596	479
III) Income from Other source :	871	322	91	1592	128	199	79	344	456	1379	287
(i)Government grants	675(25)	134(7)	61(54)	1231(55)	79(39)	77(10)	18(10)	230(34)	241(24)	884 (35)	222(14)
(ii)Interest on receipts	161	24	17	134	12	88	24	50	79	278	56
(iii)Miscellaneous	22	0	0	116	3	0	10	41	72	189	0
(iv)Security deposit/EMD/loans &advances	13	164	13	111	34	34	27	23	64	28	9
Total Income	2651	2050	113	2234	205	780	178	671	994	2527	1540
Source :(GoG, Various Years) Figures in parenthesis as a percentage of total revenue											

Richer talukas like Tiswadi, Mormugao are able to raise 43 and 47 percent respectively of Municipality revenue through municipal rates (levied on land) and taxes. When it comes to fees and other revenue and rent Bardez is able to collect around 51 percent of its income through these sources. Tiswadi is the only taluka that raises Rs.129 lakhs from realization of special acts probably due to the CCP status. The Municipalities that receive the least grants as percentage of their total income belong to the talukas of Bardez (only 7 percent of grants in total income) and Ponda and Sanguem (10 percent). Though Bardez has the fourth highest Municipal revenue, grants comprise only 7 percent of its total income which is much less as compared to the other high income talukas (Table 6.31).

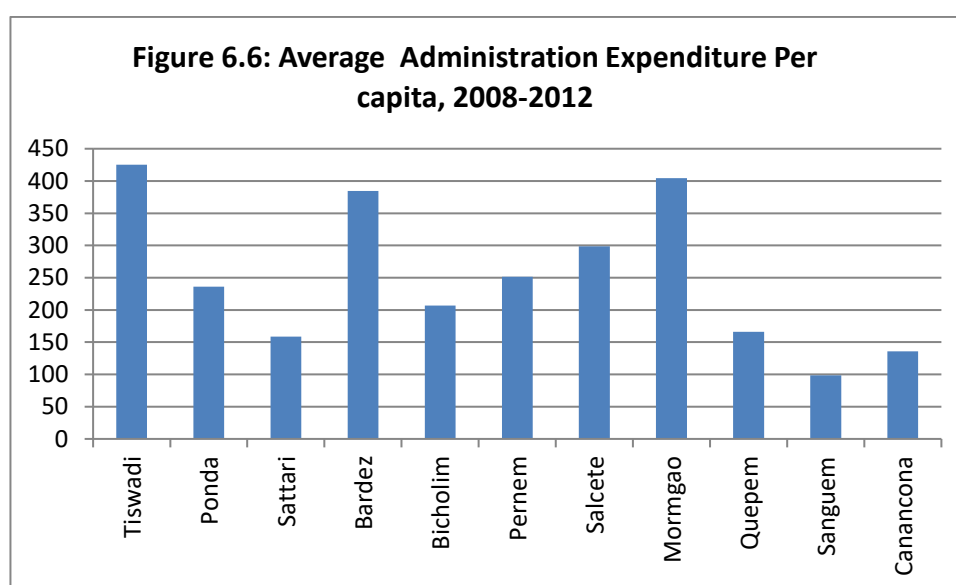
Table 6.32 : Taluka-wise expenditure components of ULBs 2012-13 (Rs lakh)											
	Tiswadi	Bardez	Perem	Bicholim	Sattari	Ponda	Sanguem	Canacona	Quepem	Salcete	Mormugao
I) General administration	1595 (84)	804 (67)	43 (20)	332 (19)	83 (27)	353 (66)	66 (39)	158 (36)	291 (43)	677 (29)	1454 (97)
II)Public safety total	19(1)	2 (0.13)	1(1)	10(1)	4(1)	4(1)	4(2)	9(2)	11(2)	0.33 (0.01)	6(0.4)
i)public lighting	19	2	1	8	0	0	0	12	0	5	0
ii)Others	0	0	0	0.2	0	0	0	0	0	5	0
iii)Public safety	0	0	0	2	4	4	4	21	11	11	6
III) Public Health Conveniences and Instructions	91(5)	286 (24)	160 (74)	1207 (69)	191 (62)	39(7)	81(49)	249(56)	271(40)	1372 (59)	0
i)Water safety	0	2	0	3	0	0	0	0	0	10	0
ii)Drainage, conservancy and sanitary	68	3	0	3	0	0	0	0.7	3	715	0
iii)Public garden	5	1	0	0.03	0	0.83	0	0	0	4.67	0
iv)Public works	17	281	160	1201	191	38	81	148	223	627	0
v)Public instruction	0	0	0	0	0	0	0	90	0.36	14	0
IV)Miscellaneous	187(10)	102 (9)	11(5)	107(6)	29(9)	0	16(10)	15(3)	108(16)	271 (12)	30(2)
i)Repayments of loans and interest				0				0	26	72	0
ii)Others	187	102	11	173	0	139	0	15	82	200	0
Total Expenditure	1892	1195	215	1750	307	535	167	443	681	2330	1460
Source: author's compilations from (GoG, Various Years). Figures in parenthesis as a percentage of total Expenditure											

Mormugao spends nearly 99 percent of its expenditure for administrative purposes with nearly nothing spent on public health conveniences and instruction and Public safety and lighting. Tiswadi too spends nearly 84 percent of its total expenditure on administration and just one percent on public safety and 5 percent on public health. Salcete on the other hand spends 29 percent of its total expenditure on administration and less than one percent on public lighting and safety, however it spends nearly 59 percent of its expenditure on Public health and conveniences. Bicholim spends only 19 percent of its total expenditure on general administration and 69 percent of its total

expenditure on public health and conveniences (Table 6.32). Municipalities need to spend more on Public health and safety in general and other productive expenditure.

6.8.1 Taluka-wise Disparities in Expenditure of VPs

In order to understand the expenditure undertaken by different VPs, we examine the amount of per capita expenditure undertaken by the VPs on different components. We have used measures like the Population weighted Theil index, Coefficient of variation (CV), Population weighted coefficient of variation and Population weighted Gini coefficient (weights are used to account for population differences).



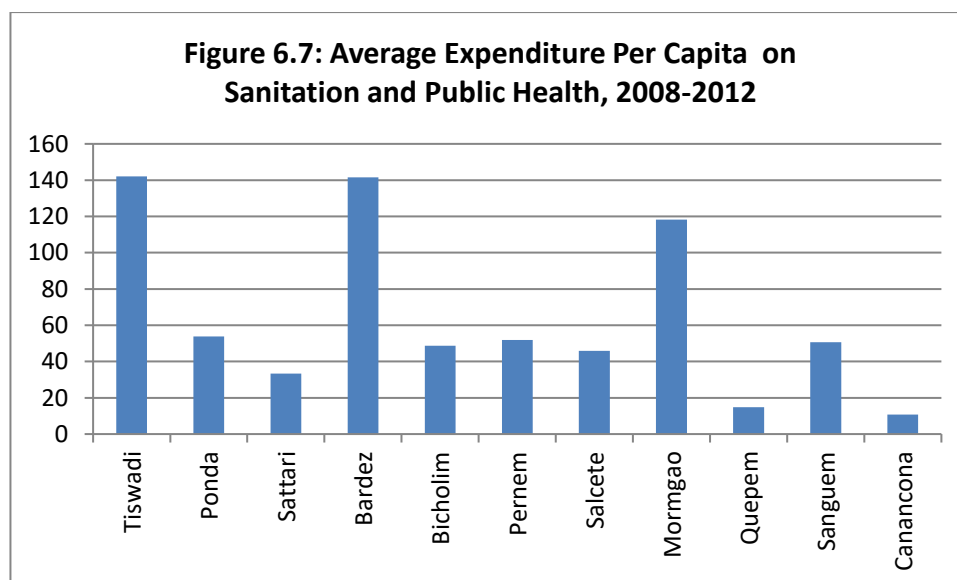
Source: Author's compilations from (GoG, Various Years)

The average per capita expenditure on administration varies greatly amongst the talukas. Tiswadi spent the highest at Rs.425 per capita followed by Mormugao (Rs. 404), Bardez (Rs. 384) and Salcete (Rs. 298). If we look at population density, Mormugao had the highest density (1406) followed by Salcete (1005), Bardez (899) and Tiswadi (830) according to the 2011 census. The taluka with the least average expenditure per capita was Sanguem but it also has the least population density (Figure 6.6).

Years	Population Weighted Theil Index	CV	Population weighted CV	Population weighted Gini Coefficient
2008-09	0.06	0.40	0.35	0.21
2009-10	0.08	0.45	0.42	0.24
2010-11	0.09	0.46	0.40	0.25
2011-12	0.12	0.49	0.44	0.27
2012-13	0.12	0.46	0.43	0.25

Source: Author's compilations from GoG (Various Years)

The disparities in administrative expenditure across talukas has been slowly rising since 2008-09, however in 2012-13 there was a decline in the level of disparity compared to the previous year. If we just take the coefficient of variation we see that the disparities are higher, however when we adjusted it for population differences the disparities are slightly lower (Table 6.33).



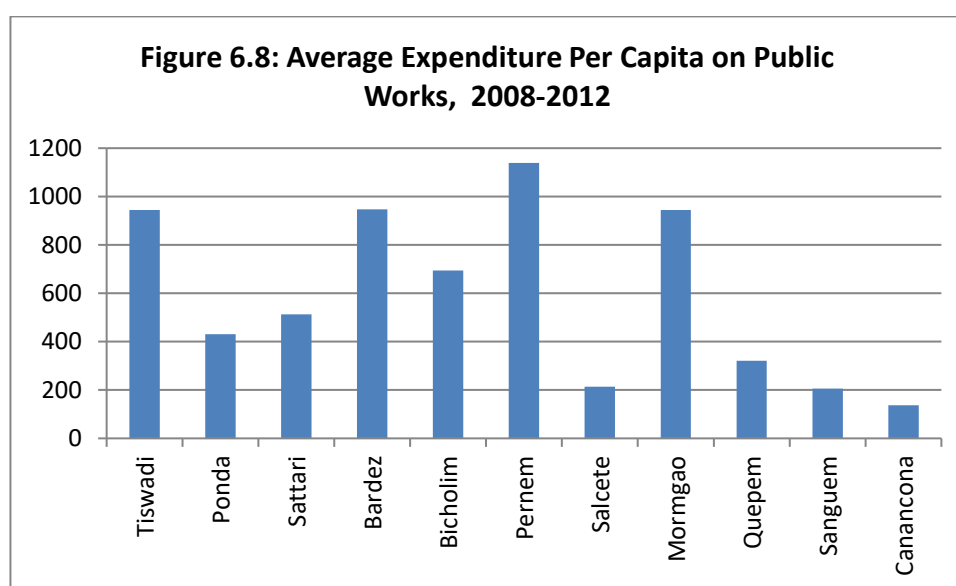
Author's compilations from (GoG, Various Years)

There are only three talukas spending more than Rs. 100 per capita on an important indicator that is Sanitation and Public Health. Tiswadi and Bardez are at the same level that is Rs. 142 per capita, followed by Mormugao at Rs. 118 per capita. Surprisingly,

Salcete (Rs. 46 per capita) spends smaller amount as compared to Ponda (Rs. 54), Bicholim (Rs. 48) and Sanguem (Rs. 50). The lowest spending talukas are Canacona (Rs.11) and Quepem (Rs.15) (Figure 6.7).

Table 6.34: Inequality Measure for Expenditure on Sanitation and Public Health (Per Capita) of VPs				
Years	Population Weighted Theil Index	Cv	population weighted CV	Population weighted Gini Coefficient
2008-09	0.32	0.82	0.76	0.43
2009-10	0.28	0.83	0.71	0.42
2010-11	0.24	0.73	0.66	0.38
2011-12	0.27	0.79	0.72	0.41
2012-13	0.42	0.92	0.90	0.47

The disparities in expenditure on Sanitation and Public Health per capita of village panchayats declined in 2009-10 and 2010-11 and then increased again. These disparities however increased quite substantially in 2012-13 (Table 6.34).

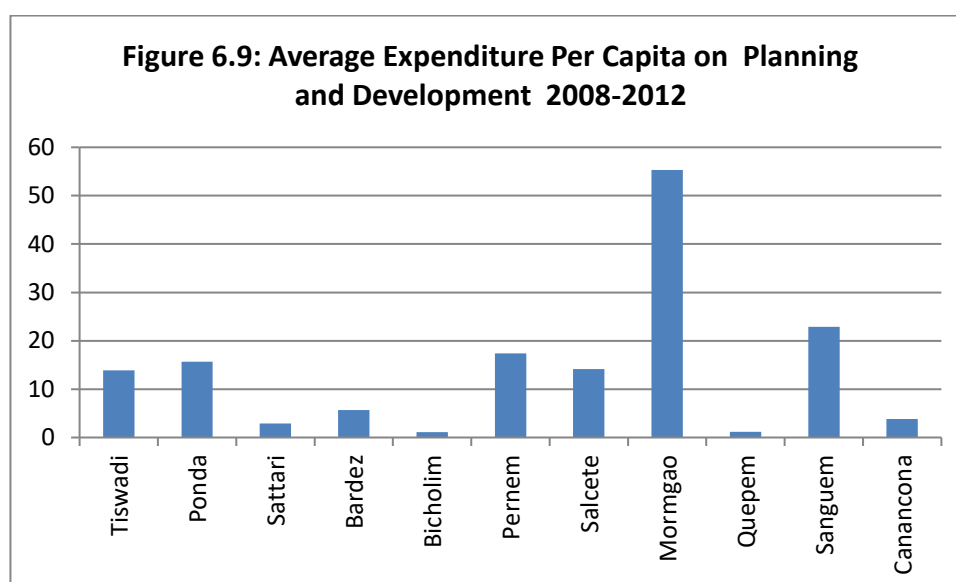


Source: Author's compilations from (GoG, Various Years)

Pernem spends the highest (Rs. 1139 per capita) on public works, followed by Tiswadi, Mormugao and Bardez (around Rs. 945 per capita). Salcete spends relatively less (Rs. 213 per capita) and its expenditure level in per capita terms is similar to Sanguem (Rs. 206 per capita) (Figure 6.8).

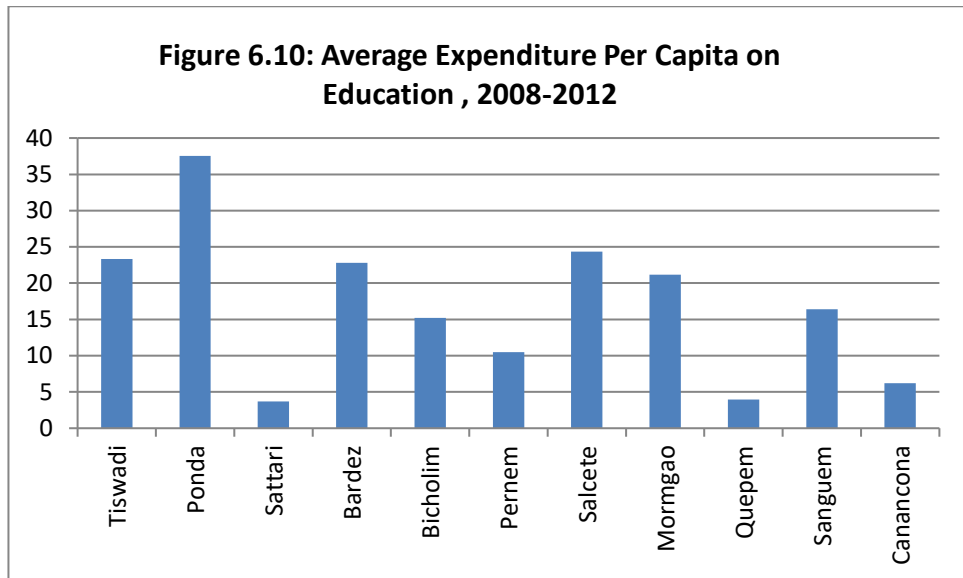
	Population Weighted Theil Index	CV	Population weighted CV	Population weighted Gini Coefficient
2008-09	0.21	0.65	0.66	0.34
2009-10	0.22	0.62	0.57	0.33
2010-11	0.24	0.65	0.58	0.35
2011-12	0.22	0.65	0.58	0.34
2012-13	0.24	0.64	0.60	0.34

When we take into account population weighted Theil index or the population weighed coefficient of variation there is a slight increase in the disparities on expenditure for public works in 2012-13. The Gini coefficient value was unchanged (Table 6.35)



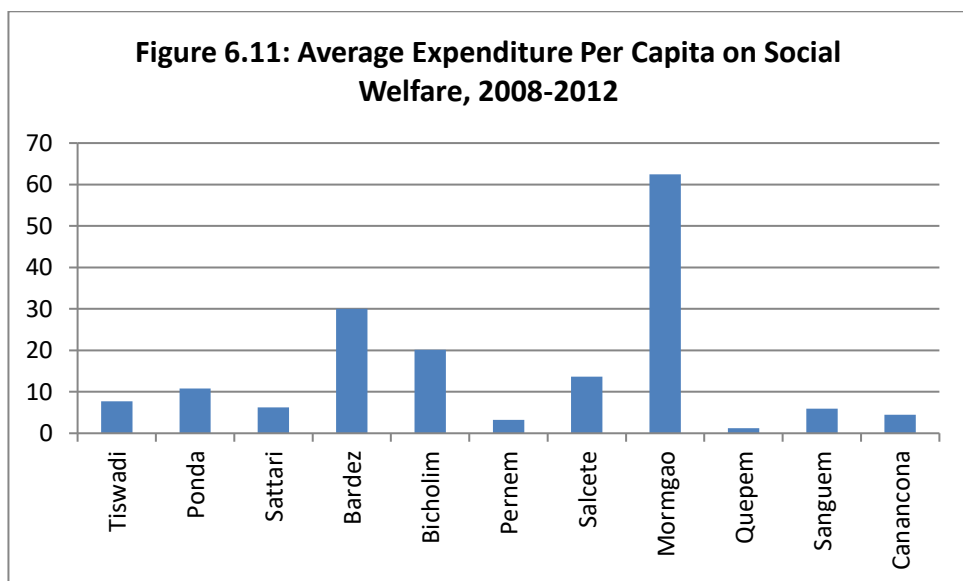
Source: Author's compilations from (GoG, Various Years)

Planning and development which is an important component shows low expenditure per capita. The taluka with the highest per capita expenditure is Mormugao (Rs. 55) followed by Sanguem (Rs 22 per capita), Tiswadi (Rs. 13 per capita) and Bardez (Rs 5 per capita) (Figure 6.9). Evidently if VPs spend so little on Planning and Development how effective can be the objective of decentralization at local level.



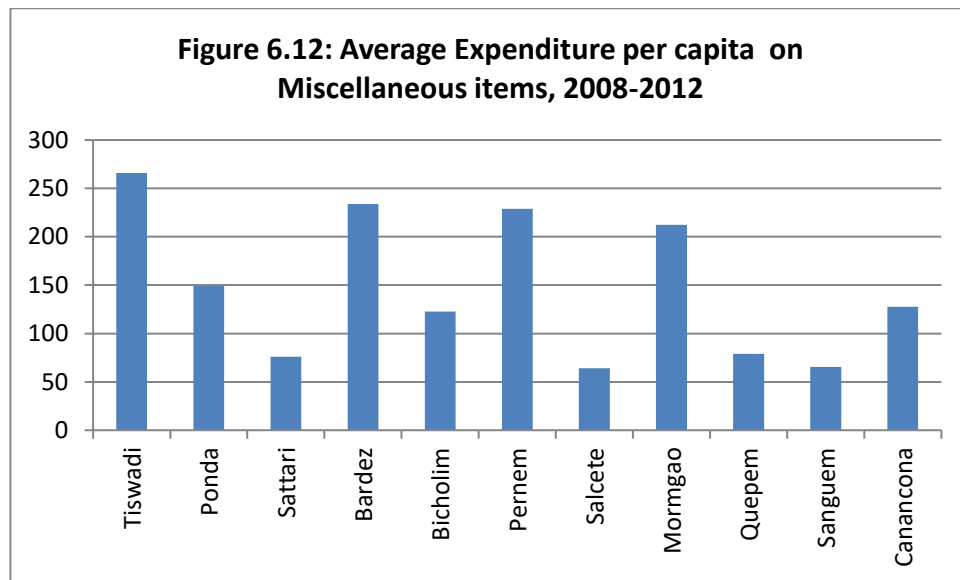
Source: Author's compilations from (GoG, Various Years)

Education expenditure per capita of the talukas is extremely low. The highest spending is by Ponda (Rs. 38 per capita) on education, followed by Salcete (Rs. 24 per capita) and Tiswadi (Rs 23 per capita). Sattari spends the least at Rs 3 per capita (Figure 6.10).



Source: Author's compilations from (GoG, Various Years)

Again expenditure on social welfare is extremely disappointing (Figure 6.11).



Source: Author's compilations from (GoG, Various Years)

Expenditure on Miscellaneous matters in per capita terms is higher than on important areas like planning and development, social welfare and education (Figure 6.12). Tiswasdi spends the highest on Miscellaneous matters per capita (Rs. 266) followed by Bardez (Rs.233) and Pernem (Rs.228). The states that spend the least on Miscellaneous matters per capita are Salcete (Rs64) followed by Sanguem (Rs. 65) and Sattari (Rs. 75) Even though Goa is the highest PCI state with strong village level institutions, the local governance ability to earn and spend are low, especially in important areas like education and planning and development. This is probably a significant difference between Kerala and Goa.

6.9 Conclusion

We now conclude this chapter by summarizing our findings. Decentralization both expenditure and revenue/tax decentralization is low not only in Goa but amongst the non-special category states in India. While Goa has surplus of funds and needs to spend funds more efficiently, some of the other states in India from the non-special category have deficit of funds and therefore need more funds to have meaningful impact of decentralization at the third tier level on various economic indicators. We found that the high income states like Punjab, Goa, Haryana have performed poorly in terms of

decentralization at the third tier of governance as compared to the other states. Even those states that perform relatively better in terms of decentralization do not have real autonomy as most of their funds are in terms of transfers from higher levels of government. Our econometric analysis of 14 non-special category states found that expenditure decentralization at the local level had a significant and negative impact on GSDP per capita. It is not clear why this negative result emerged. One suggestion in literature is to undertake proper training and to assure that accountability measures are put in place. Tax decentralization and local autonomy had no significant impact on GSDP

In Goa, the decentralization variables did not have any significant impact on GSDP per capita. A disturbing feature of the expenditure pattern is that the ULBs in Goa spend relatively more on administration. Much of the funds are diverted for revenue expenditure and the growth enhancing capital expenditure is minimal. Important components like Planning and development, education, and social welfare get less funds as compared to Miscellaneous items and administration. Therefore, the institutional environment is not favourable to successful decentralization at local level. Proper measures need to be taken in order to fulfil the Constitutional commitments of the 73rd and 74th amendment.

In the next chapter we explore possible alternative devolution weights. We anticipate how these change in weights might have affected inter-state allocation of funds for different rounds of FC allocation.

Chapter 7

Impact of alternative devolution weights

7.1 Introduction

As per article 280 (3) (a) of the Indian Constitution one of the important tasks of the Finance Commission (FC) is to devolve the share of the net proceeds of Central taxes to the states and to determine the share of each state. Given the federal structure of the Indian Union some taxes are collected by the Centre and some by the states. The net proceeds of Central taxes are considered to be the principal channel of transfer of resources from the Centre to states (FC, 2009).

7.2 Weights and Criteria used by Various FCs

The devolution of income tax and Union excise duties used different criteria from the First to the Tenth FC. Population and amount of collection (or assessment) were the only two criteria that were used to determine the shares of the states for income tax up to the Seventh FC. Population is regarded as a simple, objective and transparent indicator of the expenditure requirements of a state. This criterion results in equal per capita transfers to all states without taking into account cost disabilities across states (FC, 2000). The contribution criteria was opposed by some states. The Eighth FC had noted that the main reason to use contribution as a criterion was to take account of income from point of origin. However, it was felt that income generation especially with regard to non-agriculture income is a spatially interdependent activity. There are linkages involved through the input side as well as the demand side wherein the final output consists of inputs produced in other states (Singh, 2014). Further, the income generated from the sale of output may to a great extent depend on the incomes of consumers in each state. Thus, growing interdependence in economic activities has greatly weakened the need for considering locally originating incomes in the non-

agricultural sector. It was felt that the effort of the states in raising their own taxes was important rather than a tax levied and collected by the Centre. Hence contribution as criteria was dropped from the Tenth FC. The Tenth FC introduced a measure of tax effort for the first time. Simultaneously, fiscal performance and economic backwardness were used to determine the share of states in Union excise duties. Even devolution of the Union excise duties, was based on population as the main criterion. Its weight was reduced from 100 to 75 percent in the Sixth FC. This weight was further reduced to 25 percent by the Seventh FC. From the Eighth FC onwards there was an effort to use one formula for devolution of both Union excise and income tax. The Eight FC disbursed a part of the Union excise duties based on state deficits after the devolution of Central taxes. The problem with this criteria was that it provided states an adverse incentive to increase deficit. This was discontinued by the Ninth FC in order to maintain transparency and reduce adverse incentives to states (FC, 2000).

In order to bring in an equalizing component, the Fifth FC for the first time introduced an income distance criteria wherein states whose per capita income was less than the average per capita income of all states received a higher share of Union excise duties and this measure was normalized using the population of the states. The Sixth FC used the distance method for all states. According to this formula, income per capita of each state was subtracted from that of the highest state in a particular period. This value was then multiplied by the population of the respective state. The state with the highest per capita income had zero distance. Successive FCs have ensured that this state is also given a share based on the distance of its per capita income from that of the next highest state. The Eighth and Ninth FCs continued to use this method. The two main criteria used by Eight and Ninth FCs for providing higher per capita devolution to lower per capita income states are distance and inverse-income. The Tenth FC merely used the distance formula discontinuing with the inverse income formula. The Tenth FC, instead

of taking a single high income state as the 'representative' highest income state used a three-state average (Punjab, Maharashtra and Goa) as the benchmark from which distances were measured to level out yearly variations. The Eleventh and Twelfth FCs too followed the method used by the Tenth FC in terms of income distance measure (FC, 2004). The Thirteenth FC for the first time computed two separate averages for special category states and general category states while measuring fiscal capacity distance. The logic was that a single average applied to GSDP does not accurately capture the fiscal distance between the two groups. This is because overall GSDP does not accurately reflect the taxable base because the sectoral composition of GSDP varies across states and the sectors differ in terms of their taxability. Secondly, GSDP estimates are measured at factor cost and hence leave out remittances. Consequently state average tax-GSDP ratio is higher for general category states as compared to special category states. Group-specific averages were applied to the two categories so as to attain a closer approximation to the distance in fiscal capacity between states (FC, 2009).

The Tenth FC for the first time introduced area as a criterion. The reason attributed was that a state with larger area had to undertake higher administrative costs to deliver comparable standards of services. However, it was felt that though the costs of providing services increased with the size of a state. It was at a diminishing rate and beyond a certain point incremental costs would become negligible. Further states with smaller areas have to undertake certain minimum administrative and public service provision costs. In many of the smaller states these costs may be higher because of the unfavourable geographical terrain. Taking into account these concerns, the Tenth FC used an adjustment procedure whereby a ceiling of 10 percent and a floor of 2 percent were introduced. This was subsequently continued by Eleventh, Twelfth and Thirteenth FCs (FC, 2004; FC, 2009).

More recent FCs have tried to incorporate incentives like fiscal discipline and tax effort in determining devolution. The Tenth FC had made a beginning in this direction introducing an index of tax effort made by the states. Tax effort was calculated by dividing the state own tax revenue with its corresponding income in per capita terms and it was weighted by the inverse of per capita income. This was done to make sure that if a poorer state exerted as much tax effort as a richer state, it would get additional funds. The Eleventh FC used the same formula as that of the Tenth FC for tax effort however it only changed the weight assigned. In addition to tax effort, the Eleventh FC also included an index of fiscal discipline. While calculating this index, the Eleventh FC used the ratio of state own revenue to its revenue expenditure and this ratio was further divided by a similar ratio for all states. The computed ratio is used to measure the improvement in the index in a reference period as compared to a base period. Such an improvement could be a result of higher own revenues or lower revenue expenditure or a combination of the two. The individual state's performance is compared with the average of other states. If all states are performing badly, then the state that performs comparatively better is rewarded. Similarly, if the revenue balance is improving for all states, the state where improvement is comparatively greater is rewarded more. The same formula for developing index of fiscal discipline was used by the Twelfth and Thirteenth FCs (FC, 2004; FC 2009).

The Tenth FC onwards the devolution criteria have more or less focussed on population and income distance to reflect need factors, area and infrastructure index to reflect cost disability factors and tax effort and fiscal discipline to reflect fiscal efficiency indicators. Thus these FCs have used both equity and efficiency as the two guiding principles while determining tax devolution. The principle of equity addresses the problem of differences in revenue raising capacity and cost disabilities across states.

The principle of efficiency aims to incentivise states to exploit their resource base and manage their fiscal operations effectively.

This brief summary of changing criteria for devolution is indicative of the philosophical basis followed by each FC. However there have been many recommendations by individual states asking to change either the existing weights or the criteria used by the FCs over a period of time. For example, some states wanted the Thirteenth FC to use the 2001 census population instead of 1971 population in determining the population shares. Besides, the weightage suggested for these criteria varied from 10 to 70 percent. Few states have suggested that suitable weightage should be given to the Scheduled Castes/Scheduled Tribes population in a state. Population below the poverty line in each state was also suggested as a criterion. Other criteria suggested by states include forest cover, length of international border, infrastructure, levels of backwardness, human development index, share of primary sector in Gross State Domestic Product, each state's contribution to Central taxes and expenditure on social sectors and infrastructure (FC, 2009). There is a moral hazard problem here. States would continue to show poor performance and continue to remain backward in order to get greater funds from the Centre (Fan et al., 2004; X. Zhang, 2006).

Some economists felt that the formulae and criteria used by the FCs were more of a gap-filling type. It was felt that while the system of federal transfers in India have been successful in disbursing funds towards the poorer states, they may have been less effective in incentivising states to strengthen their fiscal discipline (Bhatt & Scaramozzino, 2013). Besides, FCs have no incentive to encourage states to spend these funds on important social and economic overheads.

7.3 Share of States in Central Taxes

We reproduce below the share of states from the Eleventh FC onwards (Table 7.1) It is evident that the share of states vary with the criteria and weights used (Table 7.2). For

some states (like Haryana, Goa and Odisha) there has not been too much alteration in the shares since the Eleventh FC but for others there has been a substantial variation (like Bihar, Madhya Pradesh and Uttar Pradesh). The share of Bihar and Uttar Pradesh decreased considerably during the Fourteenth FC, while the share of Madhya Pradesh decreased considerably during the Eleventh FC.

**Table 7.1: Share of States in Central Taxes
(Income tax and Union Excise Duties combined) (Percent)**

States	FC-XI 2000-05	FC-XII 2005- 10	FC-XIII 2010-15	FC-XIV 2015 -20	Change in share (%) from the FC-XI to FC-XIV Increase(+) / Decrease (-)
Andhra Pradesh	7.7	7.36	7.05	4.31	-3.39
Arunachal Pradesh	0.24	0.29	0.33	1.37	1.13
Assam	3.29	3.24	3.63	3.31	0.02
Bihar	14.6	11.03	11.09	9.67	-4.93
Chhattisgarh		2.65	2.51	3.08	3.08
Goa	0.21	0.26	0.27	0.38	0.17
Gujarat	2.82	3.57	3.09	3.08	0.26
Haryana	0.94	1.08	1.06	1.08	0.14
Himachal Pradesh	0.68	0.52	0.78	0.71	0.03
Jammu & Kashmir	1.29	1.3	1.55	1.85	0.56
Jharkhand		3.36	2.85	3.14	3.14
Karnataka	4.93	4.46	4.4	4.71	-0.22
Kerala	3.06	2.67	2.38	2.5	-0.56
Madhya Pradesh	8.84	6.71	7.23	7.55	-1.29
Maharashtra	4.63	5	5.28	5.52	0.89
Manipur	0.37	0.36	0.45	0.62	0.25
Meghalaya	0.34	0.37	0.41	0.64	0.3
Mizoram	0.2	0.24	0.27	0.46	0.26
Nagaland	0.22	0.26	0.31	0.5	0.28
Odisha	5.06	5.16	4.86	4.64	-0.42
Punjab	1.15	1.3	1.41	1.58	0.43
Rajasthan	5.47	5.61	5.95	5.5	0.03
Sikkim	0.18	0.23	0.24	0.37	0.19
Tamil Nadu	5.39	5.31	5.05	4.02	-1.37
Telangana				2.44	-
Tripura	0.49	0.43	0.51	0.64	0.15
Uttar Pradesh	19.8	19.26	19.99	17.96	-1.84
Uttarakhand		0.94	1.12	1.05	1.05
West Bengal	8.12	7.06	7.38	7.32	-0.8

Source: (FC, various years)

The weightage given to area and population by the Twelfth and Thirteenth FC is the same that is 25 and 10 percent respectively (Table 7.2). However the weightage given by the Eleventh and Fourteenth FCs for these two criteria vary considerably. The Eleventh FC gave a weightage of 10 percent to population and 7.5 percent to area. The Fourteenth FC gave a weightage of 17.5 percent to population however it also gave a 10 percent weightage for 2011 population as a proxy for demographic change. It also for the first time included an environmental criteria in the form of forest cover and gave it a weightage of 7.5percent. Except for the Thirteenth FC all the other three commissions used income distance as a criteria. The Eleventh FC gave a weightage of 62.5 percent while the Twelfth and Fourteenth FC gave a weightage of 50 percent. The Thirteenth FC used fiscal capacity distance as a criteria and gave it a weightage of 47.5 percent. The Fourteenth FC did not use any criteria to factor in fiscal discipline or tax effort, while all the three previous Commissions have used fiscal discipline as a criterion. The Thirteenth FC gave a high weightage to fiscal discipline but did not use tax effort as a criteria as used by the previous two FCs. Though it has been stated that the recent FCs have stressed on the two guiding principles of equity and efficiency while determining the share of states in tax devolution, it seems that the Fourteenth FC has not used any criteria to factor in efficiency. Besides none of the FCs have used any outcome indicator to incentivise states to undertake expenditure that promotes the attainment of better outcome indicators.

Table 7.2 Criteria and Weights for Tax Devolution to States					
Sr. No.	Criteria	FC-XI	FC-XII 2005-10	FC-XIII 2010-15	FC-XIV 2015-20
1	Population 1971	10	25	25	17.5
2	Area	7.5	10	10	15
3	Income Distance	62.5	50		50
4	Fiscal capacity distance			47.5	
5	Fiscal discipline	7.5	7.5	17.5	
6	Tax Effort	5	7.5		
7	Index of Infrastructure	7.5			
8	Demographic Change				10
9	Forest cover				7.5
Source: (FC, various years)					

7.4 Alternate and Additional Criteria

In this chapter we focus on the criteria of the Thirteenth and Fourteenth FCs being the most immediate and include social outcome indicators to examine how these would affect the shares. We know that incentives play a big role in improving economic performance. We used performance on social indicators as additional criteria while keeping the forest cover as an environmental criteria.

The method we follow is to retain the original criteria as used by the Thirteenth and Fourteenth FCs and added the additional criteria as mentioned above. The social indicators used include Male-Female Ratio (MFR) and Female Literacy Rate (FLR) which were easily measurable. The states that have achieved higher levels on these social indicators have been allotted a higher share. The reason for doing this is that those states which spend more on education and other social purposes will perform better on social indicators. Therefore using social indicators as a criterion will incentivise states to perform better in the social sector.

The provision of educational opportunities for women has been an important part of national endeavour since India's independence. However despite this there is considerable gender disparity in education. This is more pronounced in the rural areas and amongst disadvantaged groups (GoI, n.d.). As per the Census 2011 the literacy rate

for men was 82.14 percent whereas for women it was only 65.4 percent. High rates of female literacy will increase human development and positively impact the economic growth rate as studies have shown that countries that invest in protecting the rights of women and undertake measures to provide them with educational opportunities have lower incidences of corruption and higher economic rates than others. Increase in female literacy rates will help to reduce child mortality rates as well as fertility rates and it will also influence the educational level of the future generations (UNDP, 2015)

We now turn to the other measure of social development that is the Female-Male ratio (FMR). Human development depends largely on the achievement of gender equality and the level of empowerment of women in the country (UNDP, 2015). Many socio-economic relationships are intimately related to the balance or disparity between the number of males and females (Trewartha, 1969). Sex ratio reflects the socio cultural status and existing maternal and child healthcare programmes (Thakur and Kumara, 2008). Low sex ratio reflects the low status of women in the society and their inaccessibility to medical and educational facilities (UNDP, 2015).

The third criterion we keep in our formulation is the environment. Environmental sustainability has become one of the important factors of development policy formulation. Measures taken by states to maintain and increase the supply of environmental public goods have resulted in positive environmental externalities that have benefitted the nation as a whole. However, states have an opportunity cost of maintaining environmental goods like forests which could have been depleted for commercial purposes. Hence, environmental services are important in the construction of optimal inter-governmental fiscal arrangements (FC, 2009).

We present below the criteria used by the Thirteenth FC (FC, 2009):

The share of each state (S_i) is measured using a weighted sum of four parameters:

$$S_i = \sum_{m=1}^4 S_i^m w_m \tag{7.1}$$

Where w_m stands for the weight of the m^{th} parameter and $m = 1, \dots, 4$.

“ i ” stands for the index of states wherein $i = 1, \dots, 28$

The formula for each of the four parameters as used by the Thirteenth FC is as follows:

a. Population

The share of each state under this criteria is measured as follows:

$$S_i^{m=1} = \text{pop}_i^{1971} / \sum_{i=1}^{28} \text{pop}_i^{1971} \quad (7.2)$$

Where pop_i^{1971} stands for 1971 population of the i^{th} state

b. Area

The formula used to measure the share of each state using area as a criteria is as follows:

$$S_i^{m=2} = \text{area}_i / \sum_{i=1}^{28} \text{area}_i \quad (7.3)$$

Where area of each state is given a minimum floor of two percentage points and all the other shares of states are lowered accordingly so that the shares of all states sum up to unity.

c. Fiscal Capacity Distance

$$S_i^{m=3} = \text{pop}_i^{1971} d_{i,j} / \sum_{i=1}^{28} (\text{pop}_i^{1971} d_{i,j}) \quad (7.4)$$

where $d_{i,j} = (kY^* - k_j Y_{ij})$ this applies to all states except for Goa, Haryana and Maharashtra which are given a value of 100

k is the 3 year average tax/GSDP value for all states

k_j is the 3 year average tax /GSDP value of special / non-special category states;
 $j = 1, 2$

Y^* stands for 3 year average comparable per capita GSDP of Haryana

$Y_{i,j}$ represents 3 year average GSDP per capita of each state.

Three year average is computed for the time period 2004-07

d. Fiscal Discipline

$$S_i^{m=4} = \text{pop}_i^{1971} f_i / \sum_{i=1}^{28} (\text{pop}_i^{1971} f_i) \quad (7.5)$$

Here, $f_{i=\left(\frac{A}{B}\right)^{2005-08} / \left(\frac{A}{B}\right)^{2001-04}}$

$$A = \left(\frac{OwnRevenue_i}{RevenueExpenditure_i} \right)$$

$$B = \left(\frac{\sum_{i=1}^{28} (OwnRevenue)_i}{\sum_{i=1}^{28} (RevenueExpenditure)_i} \right)$$

We propose a modification of these criteria and suggest the inclusion three more criteria as discussed earlier. We then re-estimate the Thirteenth FC allocation as follows (Table 7.1):

- (1) Female-Male ratio distance measures the distance of each state from the one with the lowest Female -Male ratio for 2001. This distance so calculated is divided by the sum total of distances of all states. As an alternative method, we also used improvement of the Female-Male ratio in 2001 as compared to 1991. The use of the improvement ratio is not based on its current absolute value but depends on how much improvement the states have made over the decade. The decadal change in a state is divided by the sum total of the change for all states. Census data of comparable years are used.
- (2) Female Literacy rate criterion measures the distance of each state from the state with the lowest literacy rate. This distance is divided by the sum total of distances for all states. Even for literacy rate we have alternatively computed an improvement criteria to capture the improvement in 2001 over 1991. It is measured in the same way as the sex ratio improvement. Data on female literacy rate is taken from the 2001 and 1991 Census data.
- (3) Forest cover was used by the Fourteenth FC. We improve on this slightly. In our estimates here forest cover is measured using the very dense and moderately dense forest cover in each state as a ratio of its total geographical area. This ratio for each state is then divided by the sum total of ratio of all states. Data on forest cover is for the year 2007 is taken from the (GoI, 2009). Similar to the earlier two criteria the improvement ratio is calculated

as the change in 2007 over 2003. The reason for choosing these years is determined by the availability of data for these two years. We measure the difference in the forest –geographical ratio of 2007 as compared to 2003. The value for each state is then subtracted from the state with least ratio and the total is summed for all states. This value that is subtracted is then normalized by dividing it from the sum total.

The introduction of three new criteria required the reconfiguration of weights (Table 7.3). We have assigned equal weight of 7.5 percent to Female-Male ratio, literacy rate and forest cover. Correspondingly the weight of fiscal capacity distance has been reduced from 47.5 to 25 percent so that the weights sum up to 100 percent.

The reason for lowering traditional weights and adding new ones is to focus on development outcomes as the fiscal objective of public policy.

Sr. No	Actual criteria	Actual Weights	Alt I-Author's alternative base level criteria	Alternative weights	Alt II- Author's alternative improvement criteria	Alternative Weights
1	Population 1971	25	Population 1971	25	Population 1971	25
2	Area	10	Area	10	Area	10
3	Fiscal capacity distance	47.5	Fiscal capacity distance	25	Fiscal capacity distance	25
4	Fiscal discipline	17.5	Fiscal discipline	17.5	Fiscal discipline	17.5
5			Female-Male Ratio	7.5	Female-Male Ratio	7.5
6			Female Literacy rate	7.5	Female Literacy rate	7.5
7			Forest cover	7.5	Forest cover	7.5

When we re-calculate the share of states using Alt I we find the following changes. States that show a decline in share are Andhra Pradesh, Assam, Bihar, Jharkhand,

Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and West Bengal. Infact Uttar Pradesh has a drastic reduction (5 percent) in its share followed by Bihar (3 percent). Jammu and Kashmir has no change in their share.

Table 7.4 Derivation of Alternate Shares using Alternative Base Level Criteria (Alt I) - FC-XIII			
States	Actual share	Share computed using alternative criteria	Gains(+) / loss (-) (Column 3-2)
1	2	3	4
Andhra Pradesh	6.94	6.30	-0.64
Arunachal Pradesh	0.33	1.36	1.04
Assam	3.63	3.29	-0.34
Bihar	10.92	7.63	-3.29
Chhattisgarh	2.47	2.95	0.48
Goa	0.27	1.48	1.22
Gujarat	3.04	3.38	0.33
Haryana	1.05	1.18	0.13
Himachal Pradesh	0.78	1.64	0.86
Jammu & Kashmir	1.55	1.55	0.00
Jharkhand	2.80	2.61	-0.20
Karnataka	4.33	4.41	0.08
Kerala	2.34	3.74	1.40
Madhya Pradesh	7.21	5.83	-1.38
Maharashtra	5.20	5.56	0.36
Manipur	0.45	1.44	0.99
Meghalaya	0.41	1.61	1.21
Mizoram	0.27	1.50	1.23
Nagaland	0.31	1.23	0.91
Odisha	4.78	4.08	-0.70
Punjab	1.39	2.06	0.67
Rajasthan	5.85	4.83	-1.02
Sikkim	0.24	1.08	0.84
Tamil Nadu	4.97	5.23	0.26
Tripura	0.51	1.69	1.18
Uttar Pradesh	19.68	14.41	-5.27
Uttarakhand	1.12	1.75	0.63
West Bengal	7.26	6.20	-1.07

The states that gain are those that have done well in development and environmental indicators. Goa has an increase in its share and for the first time its share would increase to 1.482 as compared to the actual share of the FC-XIII which was 0.266. Most of the

high income states have an increased share when the additional criteria are used (Table 7.4). The actual values for each criteria is given in Appendix 7.1

Next we used the improvement (relative) Alt II criteria instead of the absolute values of social and environmental indicators. The change in shares of each state is indicated in Table 7.5.

States	Actual Share	Share Computed using improvement criteria	Gains(+) / loss (-) (Column 3-2)
1	2	3	4
Andhra Pradesh	6.94	6.39	-0.55
Arunachal Pradesh	0.33	1.92	1.59
Assam	3.63	3.45	-0.18
Bihar	10.92	8.20	-2.72
Chhattisgarh	2.47	2.77	0.30
Goa	0.27	0.31	0.04
Gujarat	3.04	2.79	-0.26
Haryana	1.05	1.17	0.13
Himachal Pradesh	0.78	0.97	0.19
Jammu & Kashmir	1.55	1.67	0.12
Jharkhand	2.80	3.31	0.51
Karnataka	4.33	4.28	-0.05
Kerala	2.34	3.26	0.92
Madhya Pradesh	7.21	6.14	-1.07
Maharashtra	5.20	4.98	-0.22
Manipur	0.45	1.34	0.89
Meghalaya	0.41	2.14	1.73
Mizoram	0.27	0.89	0.62
Nagaland	0.31	1.25	0.94
Odisha	4.78	3.93	-0.85
Punjab	1.39	1.85	0.46
Rajasthan	5.85	5.56	-0.29
Sikkim	0.24	0.82	0.58
Tamil Nadu	4.97	5.29	0.32
Tripura	0.51	0.99	0.47
Uttar Pradesh	19.68	15.41	-4.27
Uttarakhand	1.12	2.24	1.12
West Bengal	7.26	6.69	-0.57

When the improvement indicators (Alt II) are used the shares of states again alter considerably. The states with a decline in share using the improvement criteria as compared to the actual share of FC-XIII are Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and West Bengal. The actual values for each criteria are given in Appendix 7.2

Table 7.6 Gains and losses in shares with alternative criteria as compared to actual shares: FC-XIII		
States	Alternative base level Criteria (Alt I)	Improvement Criteria (Alt II)
	Gains(+) / loss (-)	Gains(+) / loss (-)
1	2	3
Andhra Pradesh	-0.639	-0.549
Arunachal Pradesh	1.036	1.587
Assam	-0.342	-0.182
Bihar	-3.289	-2.715
Chhattisgarh	0.478	0.299
Goa	1.216	0.04
Gujarat	0.334	-0.255
Haryana	0.131	0.125
Himachal Pradesh	0.856	0.189
Jammu & Kashmir	0.00	0.12
Jharkhand	-0.196	0.512
Karnataka	0.078	-0.053
Kerala	1.402	0.915
Madhya Pradesh	-1.38	-1.068
Maharashtra	0.361	-0.224
Manipur	0.988	0.891
Meghalaya	1.206	1.732
Mizoram	1.234	0.624
Nagaland	0.913	0.94
Odisha	-0.704	-0.846
Punjab	0.672	0.46
Rajasthan	-1.023	-0.291
Sikkim	0.842	0.579
Tamil Nadu	0.258	0.322
Tripura	1.183	0.474
Uttar Pradesh	-5.267	-4.267
Uttarakhand	0.628	1.121
West Bengal	-1.067	-0.57

The states that lose when either Alt I or Alt II are used are Andhra Pradesh, Assam, Bihar, Madhya Pradesh Odisha, Rajasthan, Uttar Pradesh and West Bengal (Table 7.6). The states that gain in both are Arunachal Pradesh, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Kerala, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Tamil Nadu and Uttarakhand. The states that gain in Alt I but lose in Alt II are Gujarat, Karnataka and Maharashtra. The state that loses in Alt I but gains in Alt II is Jharkhand

Table 7.7 presents the gainers and losers using alternative criteria based on Table 7.6

Table No:7.7 FC XIII Gainers and Losers using Alternative Criteria		
	Gainers	Losers
Alt I	Arunachal Pradesh, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Punjab, Sikkim, Tamil Nadu, Tripura and Uttarakhand	Andhra Pradesh, Assam, Bihar, Jharkhand, Madhya Pradesh, Odisha, Rajasthan , Uttar Pradesh and West Bengal
Alt II	Arunachal Pradesh, Chhattisgarh, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Kerala, Manipur, Mizoram, Meghalaya, Nagaland, Punjab, Sikkim, Tamil Nadu, Tripura and Uttarakhand	Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Uttar Pradesh and West Bengal

We now turn our attention to the Fourteenth FC and attempt a similar exercise. We alter the criteria and weights used by the Fourteenth FC and see its impact on the respective share of states. To re-capitulate the criteria used by the Fourteenth FC are:

- (1) 1971 Population: Similar to the Thirteenth FC mentioned above
- (2) Demography: This criteria captures the changes in population due to migration and age structure. This criteria was used by giving weight to the 2011 Census

Population using the same formula as that used for 1971 population and replacing 1971 population with 2011 population.

- (3) Forest Cover: This criteria was a new addition in the Fourteenth FC. It is derived by taking the percentage share of each state in very dense and moderate forest area as a share of the total (moderate and very dense forest cover) for all states.
- (4) Income Distance: A three-year average (2010-11 to 2012-13) comparable per capita GSDP has been used for all the twenty-nine states. Income distance is derived by taking the distance from the state having highest per capita GSDP. Here, Goa had the highest per capita GSDP, followed by Sikkim. Since these two were very small states, income distance has been computed from the state with the third highest per capita GSDP that is Haryana. Goa, Sikkim and Haryana were provided the same distance as obtained for the state with the smallest distance of income with Haryana.

The additional criteria we use for the Fourteenth FC are:

- a) Social development criteria (Female- Male Ratio (FMR)) and Female Literacy Rate (FLR)) similar to that used for the Thirteenth FC have been used with an altered time period. FMR and FLR data are taken from the 2011 Census. In order to compute improvement criteria we have compared 2011 with 2001 census data.
- b) Forest cover as a criteria was already included by the Fourteenth FC. We have modified this criteria. The sum of very dense and moderate forest area as a proportion of the total geographical area has been used. If a state has a higher proportion of its area under very dense and moderate forests then it will have a higher opportunity cost of maintaining these forests areas. This ratio for each state is then divided by the sum total of all states. Data on forest cover is for the year 2013 from the (GoI, 2013). The improvement ratio is calculated by taking the difference in ratio for the year 2013 over 2007 (the choice of years being determined by data availability. The index value for

each state is then subtracted from the state with least ratio and the total is arrived by adding of all states. The index value is normalized (by dividing it by the sum total).

Sr. No	Actual criteria	Actual weights	Alt I- Author's alternative base level criteria	Alternative weights	Alt II- Author's alternative improvement criteria	Alternative weights
1	Population 1971	17.5	Population 1971	17.5	Population 1971	17.5
2	Area	15	Area	15	Area	15
3	Income Distance	50	Income Distance	35	Income Distance	35
4	Demographic Change	10	Demographic Change	10	Demographic Change	10
5	Forest cover	7.5	Forest cover	7.5	Forest cover	7.5
6			Female – Male ratio	7.5	Female-Male ratio	7.5
7			Female Literacy rate	7.5	Female Literacy rate	7.5

Like in the reorganisation of the Thirteenth FC, we have reassigned weights to accommodate the additional criteria. This is achieved by giving FMR and FLR a weightage of 7.5 percent each. Simultaneously weightage of income distance was reduced to 35 percent to restore the total to 100 percent (Table 7.8)

Table 7.9 Derivation of alternate share using Alternative Base Level Criteria (Alt I): FC -XIV				
States	FC-XIV Actual share as reported in FC-XIV Report	FC-XIV share without separating Telangana	FC-XIV share with additional criteria	Gains (+) Losses (-) (Column 4-3)
1	2	3	4	5
Andhra Pradesh	4.31	6.69	5.94	-0.74
Arunachal Pradesh	1.37	1.37	1.52	0.15
Assam	3.31	3.30	3.19	-0.11
Bihar	9.67	9.63	7.67	-1.95
Chhattisgarh	3.08	3.07	2.90	-0.17
Goa	0.38	0.40	1.64	1.24
Gujarat	3.08	3.08	3.19	0.11
Haryana	1.08	1.36	1.47	0.11
Himachal Pradesh	0.71	0.71	1.46	0.75
Jammu & Kashmir	1.85	1.85	1.65	-0.20
Jharkhand	3.14	3.13	2.86	-0.27
Karnataka	4.71	4.70	4.42	-0.29
Kerala	2.50	2.50	3.74	1.25
Madhya Pradesh	7.55	7.53	6.04	-1.49
Maharashtra	5.52	5.52	5.29	-0.23
Manipur	0.62	0.62	1.57	0.96
Meghalaya	0.64	0.64	1.77	1.12
Mizoram	0.46	0.46	1.67	1.21
Nagaland	0.50	0.50	1.43	0.93
Odisha	4.64	4.63	3.86	-0.77
Punjab	1.58	1.57	2.07	0.49
Rajasthan	5.50	5.48	4.81	-0.68
Sikkim	0.37	0.37	1.24	0.87
Tamil Nadu	4.02	4.02	4.27	0.26
Tripura	0.64	0.64	1.89	1.25
Uttar Pradesh	17.96	17.89	14.47	-3.42
Uttarakhand	1.05	1.05	1.53	0.48
West Bengal	7.32	7.30	6.44	-0.86

Note: Telangana was formed in 2014 and the data used to compute alternate criteria use 2001 and 2011 Census data for states which is not available for Telangana and hence it hence been retained as a part of Andhra Pradesh .

For the Fourteenth FC the states which lose when the additional criteria are used are Andhra Pradesh, Assam, Bihar Chatthisgarh, Jharkhand , Jammu and Kashmir, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and West

Bengal. The states which gain are Goa, Gujarat, Punjab, Haryana, Uttarakhand, Kerala, Tamil Nadu, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Arunachal Pradesh (Table 7.9).

Table 7.10: Derivation of alternate shares using Improvement Criteria (Alt II) : FC-XIV				
States	Actual share as reported in FC-XIV Report	FC-XIV shares without separating Telangana	FC-XIV share with improvement criteria	Gains (+) Losses (-) (Column 4-3)
1	2	3	4	5
Andhra Pradesh	4.31	6.69	6.14	-0.55
Arunachal Pradesh	1.37	1.37	1.85	0.47
Assam	3.31	3.30	3.41	0.11
Bihar	9.67	9.63	8.18	-1.45
Chhattisgarh	3.08	3.07	2.45	-0.62
Goa	0.38	0.40	1.07	0.67
Gujarat	3.08	3.08	3.23	0.15
Haryana	1.08	1.36	2.30	0.94
Himachal Pradesh	0.71	0.71	1.06	0.35
Jammu & Kashmir	1.85	1.85	1.91	0.06
Jharkhand	3.14	3.13	3.12	-0.01
Karnataka	4.71	4.70	4.36	-0.35
Kerala	2.50	2.50	2.91	0.41
Madhya Pradesh	7.55	7.53	6.27	-1.26
Maharashtra	5.52	5.52	5.22	-0.30
Manipur	0.62	0.62	1.70	1.09
Meghalaya	0.64	0.64	1.52	0.87
Mizoram	0.46	0.46	1.22	0.76
Nagaland	0.50	0.50	1.47	0.97
Odisha	4.64	4.63	4.32	-0.31
Punjab	1.58	1.57	1.97	0.40
Rajasthan	5.50	5.48	5.20	-0.28
Sikkim	0.37	0.37	1.25	0.88
Tamil Nadu	4.02	4.02	4.03	0.02
Tripura	0.64	0.64	1.22	0.58
Uttar Pradesh	17.96	17.89	14.68	-3.21
Uttarakhand	1.05	1.05	1.43	0.38
West Bengal	7.32	7.30	6.53	-0.77

When we use the improvement criteria (Alt II) for the Fourteenth FC method, the states which lose out are Andhra Pradesh, Bihar, Chattisgarh, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh and West Bengal. The states which gain are Arunachal Pradesh, Assam, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Mizoram Manipur, Meghalaya, Nagaland, Punjab, Sikkim, Tripura, Uttaranchal, Tamil Nadu and Kerala (Table 7.10).

Table 7.11 Gains and Losses in Shares using Alternative Criteria as compared to Actual Shares: FC-XIV		
States	Alternative base level criteria (Alt I)	Alternative improvement criteria (Alt II)
Andhra Pradesh	-0.74	-0.55
Arunachal Pradesh	0.15	0.47
Assam	-0.11	0.11
Bihar	-1.95	-1.45
Chhattisgarh	-0.17	-0.62
Goa	1.24	0.67
Gujarat	0.11	0.15
Haryana	0.11	0.94
Himachal Pradesh	0.75	0.35
Jammu & Kashmir	-0.20	0.06
Jharkhand	-0.27	-0.01
Karnataka	-0.29	-0.35
Kerala	1.25	0.41
Madhya Pradesh	-1.49	-1.26
Maharashtra	-0.23	-0.30
Manipur	0.96	1.09
Meghalaya	1.12	0.87
Mizoram	1.21	0.76
Nagaland	0.93	0.97
Odisha	-0.77	-0.31
Punjab	0.49	0.40
Rajasthan	-0.68	-0.28
Sikkim	0.87	0.88
Tamil Nadu	0.26	0.02
Tripura	1.25	0.58
Uttar Pradesh	-3.42	-3.21
Uttarakhand	0.48	0.38
West Bengal	-0.86	-0.77

The states that lose when either Alt I or Alt II are used Andhra Pradesh, Chhattisgarh, Bihar, Jharkhand, Karnataka, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, West Bengal, (Table 7.11). The states that gain in both the cases are Arunachal Pradesh, Goa, Gujarat, Haryana, Himachal Pradesh, Kerala, Manipur, Mizoram, Meghalaya, Nagaland, Punjab, Tamil Nadu and Uttarakhand. The states that lose in Alt I but gain in Alt II are Assam and Jammu & Kashmir. There are no states that gain Alt I but lose in Alt II.

Table 7.12 presents the gainers and losers using alternative criteria based on Table 7.11

Table No.7.12: FC-XIV: Summary of Gainers and Losers using Alternative criteria		
	Gainers	Losers
Alt I	Arunachal Pradesh, Goa, Gujarat, Haryana, Himachal Pradesh, Kerala, Punjab, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura and Uttarakhand	Andhra Pradesh, Assam, Bihar, Chhattisgarh, Jharkhand, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan ,Uttar Pradesh and West Bengal
Alt II	Arunachal Pradesh, Assam Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Kerala, Manipur, Mizoram, Meghalaya, Nagaland, Punjab, Sikkim, Tamil Nadu, Tripura and Uttarakhand.	Andhra Pradesh, Bihar, Chhattisgarh, Karnataka, Madhya Pradesh, Odisha, Maharashtra, Rajasthan, Uttar Pradesh and West Bengal, Jharkhand

7.5 Conclusion

This chapter was devoted to the assessment of the devolution formula of the different FCs. We also examined the changes that may emerge if FC adopted an incentive based scheme, whether it is based on absolute or relative achievements. We used social

indicators as an alternative criteria in order to determine the share of states. Earlier FCs have not used any outcome indicators to determine transfers to states this would benefit mostly the high income states. Whereas, the states that lose out are the comparatively lower income states. However on the positive side including outcome indicators may incentivise states to use the funds more efficiently and direct them towards the attainment of these indicators.

In the next chapter we conclude our study summarizing the main findings of the earlier chapters.

Chapter 8

Conclusion

8.1 Summary of Findings

The present study is composed of eight chapters. The first chapter is the introductory chapter. This is followed by literature review. The third chapter describes the research methodology of the thesis. Chapter four measures the impact of fiscal decentralization on major socio-economic indicators using econometric panel data models. Chapter five gives analytical insights regarding fiscal equalization in India and the impact of inter-governmental transfers on fiscal imbalances and tax effort. It also analyses the impact of political factors on inter-governmental transfers in India. Chapter six analyses the impact of fiscal decentralization at the sub-state level on state income with a special reference to Goa. Chapter seven alters the weights and criteria used by the Thirteenth and Fourteenth FCs by including social-outcome indicators and a modified environmental indicator and measures the corresponding changes in the shares of states. Chapter eight summarizes the findings and puts forth recommendations based on the findings of the study.

The first chapter provides a general outline and the structure of the thesis. It states the objectives of the study and the research questions addressed in the study. It also provides a brief summary of the chapters included in the thesis.

The objectives of this study are as follows:

- 1) To analyse how decentralization has impacted on growth and development in India.
- 2) To assess whether transfers act as a disincentive to tax effort by states and whether these transfers are influenced by lobbying.
- 3) To examine whether an incentive or outcome based allocation rule for devolution of finances by Finance Commissions would be a better alternative.

The Research Questions are as follows:

- i) What has been the extent of decentralization that has been undertaken in India at the sub-national level and sub-state level?
- ii) Has India benefited from fiscal decentralization at the sub-national level in terms of enhancing the Gross State domestic product and fostering fiscal discipline amongst states?
- iii) What has been the impact of the fiscal decentralization at the sub-national level on outcome indicators?
- iv) What has been the extent of decentralization at the third tier level of governance with specific reference to Goa?
- v) What has been the impact of transfers on fiscal deficit and tax effort amongst the states?
- vi) Are the Central transfers that are disbursed to states influenced by political factors?
- vii) If we introduced outcome indicators and changed the weights and variables used by Finance Commission how would it alter the shares received by states?

The second chapter summarizes the theoretical and empirical developments in the area of fiscal decentralization and fiscal equalization. We identify the research gap that exists in the literature and the methodological and measurement problems in the previous studies. Empirical studies have used different measures and definitions of fiscal decentralization to measure its impact on socio-economic indicators and the more recent studies suggest that the measure of fiscal decentralization should reflect the extent of autonomy of governments in their spending decision or revenue collection (Akai & Sakata, 2002; Ebel & Yilmaz, 2004; Lindaman & Thurmaier, 2002; Meloche, Vaillacourt, & Yilmaz, 2004; Oommen, 2006). Studies also suggest that different measures of fiscal decentralization should be used. Fiscal decentralization is a complex

and multifaceted phenomenon and it is not possible to capture it with a single measure (Akai & Sakata, 2002). The impact of fiscal decentralization in a country depends on a host of factors including the existing socio-economic and institutional factors and the extent of decentralization being undertaken in the country. There are not many studies with regard to the impact of decentralization on economic and development indicators for India. While Zhang & Zou (2001) found a positive relation between decentralization and economic growth in India, Jin (2009) found decentralization to negatively affect economic growth. Asfaw et al. (2007) found that rural IMR in India reduced due to decentralization. In terms of fiscal equalization, international studies have shown that inter-governmental transfers can influence fiscal deficit and tax revenue collection of the sub-national governments depending on the type of incentives they create. Bhatt & Scaramozzino (2013) found a positive long-run relationship between fiscal deficits and non-plan transfers for India. Previous empirical studies in India have found transfers to negatively impact state tax effort (Dash & Raj, 2013; Garg et al., 2014; Panda, 2009; Naganathan & Sivagnanam, 2000). Empirical studies have also shown that besides the objectives of equity and efficiency, inter-governmental transfers in India could also be affected by political lobbying (Biswas & Marjit, 2014; Garg, Goyal, & Pal, 2014; Khemani, 2003; Rao & Singh, 2001; Singh & Vashishtha, 2004).

Chapter three is entitled research methodology. This chapter argues the benefits of panel data in econometric analysis. The econometric issues including methods and tests that are commonly used are discussed here. The main types of regression models explained in this chapter are pooled OLS regression, random effects model, fixed effects model and Two Stage Least square endogenous variable model.

This chapter also explains the different measures used to determine interregional inequalities. The measures of inequality like coefficient of variation (population

weighted coefficient of variation), Theil index (population weighted Theil index) and Gini coefficient (population weighted Gini coefficient) are also discussed here.

In Chapter four we try to empirically test the impact of the decentralization on economic and development indicators in India. We construct different measures of fiscal decentralization which includes Expenditure Decentralization (ED), Tax Decentralization (TD) and an autonomy indicator for 14 major states in India. The decentralization indicators reflect autonomy in the spending decisions and revenue collection of state governments. While undertaking the statistical analysis a fixed effect model was found most suitable. TD has a positive and significant impact on the natural log of Gross State Domestic Product (GSDP) per capita of India using a fixed effects model. ED was found to impact income only after a lag of three to four years. Autonomy had a positive influence on GSDP at 10 percent level of significance. We also tested for the impact of fiscal decentralization on fiscal deficit. An instrumental variable fixed effect model was used due to the presence of endogeneity. ED was found to have a significant and positive impact on fiscal deficit, while autonomy had a significant and negative impact. TD had no significant impact

Besides economic indicators, we tried to find the impact of fiscal decentralization on important outcome indicators such as infant mortality rate and literacy rate. None of the decentralization indicators were found to have a significant impact on infant mortality rates. ED was found to have a significant and positive impact on literacy rates. TD and autonomy were found to have no impact on literacy rates.

Different measures of decentralization show differing impacts on the major economic and development indicators used in the study. All three decentralization measures are important as they can help to accentuate the positive effects of each other and to counter the negative impacts of each other.

In chapter five we examine the impact of inter-governmental transfers in India and the factors that influence them. In India, as in most countries the level of ED is much more than that of TD. Besides this, different states have differing revenue raising capacity and cost disabilities which can increase regional inequalities. Hence fiscal equalization through inter-governmental transfers becomes inevitable. We used a population weighted coefficient of variation to analyse if the transfers have indeed been equalizing. Total transfers were found to reduce fiscal disparities in aggregate state expenditure per capita. However Finance Commission (FC) transfers were found to reduce fiscal disparities in expenditure to a greater extent as compared to the Planning Commission (PC) transfers. When ED is undertaken with increased transfers rather than an appropriate TD programme it could worsen fiscal imbalances. We also found that transfers from the PC as well as the FC lead to an increase in fiscal deficit by using a fixed effects instrumental variable model. We also found that FC transfers were gap-filling in nature as they were endogenous - that is they not only influenced fiscal deficit but in turn an increase in fiscal deficit led to an increase in transfers to those states.

Transfers can also have adverse incentives for state tax effort as transfers are like cash flows to states where many of these states do not have any direct burden in their collection. Previous studies undertaken for India show that transfers have had an adverse effect on state tax effort (Dash & Raja, 2013; Garg et al.,2014; Naganathan & Sivagnanam, 2000; Panda, 2009). When we plotted a scatter diagram of state tax effort and transfers across states and over time we found a negative trend line between these two variables. However, when we plotted state tax effort and transfers individually for each state over time we found mostly a positive trend line between these two variables. This was further confirmed by the results of fixed effects model that showed a positive and significant relation between transfers and state tax effort.

Distribution of transfers in India are guided by the objectives of equity and efficiency, however there have been claims that their distribution may also be subject to political lobbying. We used two political variables which includes a dummy variable for Centre and state alliance and another variable that measures the effective number of political parties. We found that only the alliance dummy variable was significant but negative in the case of FC transfers.

Chapter six analyses the impact of fiscal decentralization at the third tier level of governance on state GSDP per capita. ED was found to have a negative and significant impact on state income of 14 major Indian states. TD and Autonomy did not have any significant impact. An analysis of the extent of fiscal decentralization suggests that very little decentralization has been undertaken at the third tier level of governance and those states that rank high in terms of ED are states who receive a greater part of their revenue from transfers. It was also found that high income states like Goa, Punjab and Gujarat were the states with low decentralization at the local level.

In terms of decentralization in Goa, the extent of decentralization was negligible and had no significant impact on state income. The local bodies specially the municipalities in Goa in the recent years were found to have excessive expenditure on administration and did not undertake more meaningful expenditure under their jurisdiction like social welfare, education expenditure etc. The local bodies also had huge revenue surplus almost every year which meant there was underutilization of funds.

In Chapter seven we explore devolution outcomes by using alternate weights and criteria than those used by the Thirteenth (FC-XIII) and Fourteenth Finance Commissions (FC-XIV). We measure the impact on the inter-se share of states in central taxes. In this chapter additional social indicators as well a modified environmental indicator (Alt I) were used so that states are incentivized to divert expenditure to attain better social development indicators along with environmental

sustainability. Improvement indicators (Alt II) based on the social criteria were also examined so that base level indicator values do not influence allocations.

In terms of the FC-XIII the states that lose when either Alt I or Alt II are used are Andhra Pradesh, Assam, West Bengal, Uttar Pradesh, Odisha, Rajasthan, Bihar and Madhya Pradesh. The states that gain in both are Haryana, Chhattisgarh, Goa, Kerala, Tamil Nadu, Punjab Arunachal Pradesh, Jammu & Kashmir, Himachal Pradesh, Manipur, Nagaland, Mizoram, Meghalaya, Uttarakhand. The states that gain in Alt I but lose in Alt II are Karnataka, Gujarat, Maharashtra. The only state that loses in Alt I but gains in Alt II is Jharkhand

In terms of the FC-XIV, the states that lose when either Alt I or Alt II are used are Andhra Pradesh, Uttar Pradesh, West Bengal, Rajasthan, Odisha, Maharashtra, Madhya Pradesh, Karnataka, Jharkhand, Bihar, Chhattisgarh, Andhra Pradesh. The states that gain in both are Haryana, , Goa, Gujarat, Kerala, Tamil Nadu, Punjab Arunachal Pradesh, Himachal Pradesh, Manipur, Nagaland, Mizoram, Meghalaya, Uttarakhand. The states that lose in Alt I but gain in Alt II are Assam and Jammu & Kashmir. There are no states that gain in Alt I but lose in Alt II

8.2 Findings of the Study

Based on the various findings summarized above, our study has the following conclusions:

- 1) While ED, TD and autonomy have a significant and positive impact on GSDP per capita at the sub-national level.
- 2) In terms of FD as a percentage of GSDP, while ED was found to have a significant and positive effect, autonomy was found to have a significant and negative impact on FD at the sub-national level. TD had no significant impact.
- 3) None of the decentralization variables were found to have any significant impact on IMR at the sub-national level.

- 4) ED was found to have a significant and positive impact on literacy rate. TD and autonomy were found to have no impact on literacy rate at the sub-national level.
- 5) Though transfers were found to be equalizing they were also found to increase FD of states. FC transfers were found to be endogenous and thus suggesting that they are gap-filling in nature
- 6) A finding which was different from the received literature for India was that transfers enhance state tax effort when we account for state fixed effects.
- 7) Centre-state alliance was found to have a significant and negative impact on FC transfers implying that FC transfers are less in the years there is Centre-state alliance.
- 8) In terms of decentralization at the third tier level of government amongst the 14 major states in India, ED was found to have a negative and significant impact on state income for the time period 1992-93 to 2002-03. Autonomy and TD did not have a significant impact on state income.
- 9) In Goa, decentralization was not found to have any significant impact on GSDP per capita.
- 10) The FC should incorporate social outcome indicators in addition to the existing criteria in their formula while determining share of states as it might create incentives for attaining better social outcomes.

8.3 Recommendations based on the Findings of the Study

Based on the findings of the study the following recommendations could be made:

- 1) In order to reap the full benefits of fiscal decentralization, the country should increase decentralization not only in expenditure but also in tax decentralization. The increase in decentralization should reflect an increase in autonomy of the states in terms of their revenue collection and expenditure responsibilities.
- 2) Inter-governmental transfers are definitely having an equalizing impact and therefore it is required to be carried out in future. However careful planning should

be done in order to create the right incentives when inter-governmental transfers are disbursed to states. Special attention should be given to the incentives the transfers create for fiscal discipline. The gap-filling nature of FC transfers also need to be addressed.

- 3) There needs to be proper planning and training of the officials at the third tier level of governance in India for undertaking efficient expenditure and management of funds. The autonomy of the third tier level of governance should be increased in terms of raising its own revenue and having freedom in undertaking their expenditure.
- 4) In Goa, greater ED and TD could be undertaken at the local level. The local bodies should undertake more of the relevant expenditure as mentioned in the schedules of the Constitutional amendments of the state and cut down on their administrative expenditures. Greater expenditures specially in the areas of education, social welfare and capital expenditure need to be undertaken in order to have a meaningful impact of decentralization on Goa's income.
- 5) The FC should also include outcome indicators as criteria in their disbursement formula besides the existing criteria that are used. Funds are provided to states based on need and outcome indicators and not based on the fiscal capacity and actual cost disabilities of states. Hence the states may have a tendency to remain backward in order to receive greater funds from FCs. There is no monitoring mechanism to analyse the performance of states on various outcome indicators by the FC. Thus it was felt that the states should have some criteria on performance based on the outcome indicators so that they are incentivized to attain better delivery of services.

8.4 Contributions of the Study

1) Despite decentralization being undertaken in India for a long time, there has been no comprehensive empirical analysis of the impact of fiscal decentralization on important economic and development indicators of India. This is the first study that analyses the impact of decentralization on fiscal deficit and outcome indicators like infant mortality and literacy rates amongst 14 major Indian states. Besides the measure of fiscal decentralization used is a more appropriate one which tries to capture the actual extent of fiscal decentralization at the sub-national level.

2) This is the first analytical study on Goa regarding the extent of decentralization at the local level.

3) This study was also the first to attempt to introduce outcome indicators in the distribution formula of the Finance Commissions and to see its impact on state shares.

4) We also break new ground by using an endogenous variable model to study the impact of transfers on fiscal deficit.

5) In terms of impact of transfers on state tax effort and the impact of political factors on transfers there have been quite a few studies undertaken before in India. However, most of these studies are dated. Our study updates these analyses. Further, our study disaggregated transfers by the type of institution through which they are disbursed as well as disaggregated transfers in terms of formula based and discretionary transfers, providing useful policy insights.

8.5 Future Scope of the Study

The study limits its analysis of fiscal decentralization at the sub-national level and for few years at the sub-state level. This is because time series data at the sub-state level is not available for all the 14 major non-special category states. In future if data at sub-state level is made available such an analysis can provide better insights for a greater time period. Our study also limits its analysis to only non- special category states as

they have characteristics and features which are very different from the special category states. It was not advisable to combine both the category states in this study. This is an area for future research since our study was undertaken at the sub-national and sub-state level, many variables that might have been more suitable for analysis had to be left out due to the unavailability of comparable data for the time period under study. If data becomes available in future, the findings of the study could be enriched further.

References

- Abdullahi, I., & Noor, Z.M. (2015). The Impact of Economic Growth on Child Labour in Developing Countries. *Journal of Economics and Sustainable Development*, 6 (12)
- Ahmad, E. (1997). *Financing Decentralized Expenditures -An International Comparison of Grants*. Cheltenham, UK: Edward Elgar Publishers.
- Ahmad, E., Singh, R., & Fortuna, M. (2004). Toward more effective redistribution: Reform options for intergovernmental transfers in China. *International Monetary Fund Working Paper No.04/98*. Retrieved from <https://www.imf.org/external/pubs/ft/wp/2004/wp0498.pdf>
- Akai, N., & Sakata, M. (2002). Fiscal decentralization contributes to economic growth: evidence from state-level cross-section data for the United States. *Journal of Urban Economics*, 52, 93–108.
- Akai, N., & Sakata, M. (2005). Fiscal decentralization, commitment and regional inequality. Evidence from State level, cross-sectional for United States. CIRJE F 315. *University of Hyogo and Osaka International University*. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.1009.3250&rep=rep1&type=pdf>
- Alagh, Y. (1999). Panchayati Raj and Planning in India: Participatory Institutions and Rural Roads. *Transport and Communications Bulletin for Asia and the Pacific*, 69.
- Alm, J., Martinez-Vazquez, J., & Indrawati, M. (2005). *Reforming Intergovernmental Fiscal Relations and the Rebuilding of Indonesia: The Big Bang Program and Its Economic Consequences*. Massachusetts, USA: Edward Elgar Publishing.
- An, T., & Ren, Q. (2007). Equity of public service: Theory, problem and policy. *Journal of Finance and Trade Economics*, 8, 48–53.

- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, 58(2), 277–297.
- Arun, A., & Ribot, J. (1999). Analyzing Decentralization: A Framework with South Asian and West African Cases. *Journal of Developing Areas*, 33, 473– 502.
- Asfaw, A., Frohberg, K., James K.S., & Jutting, J. (2007). Fiscal Decentralization and Infant Mortality: Empirical Evidence from Rural India. *The Journal of Developing Areas*, 41(1). Retrieved from <http://www.jstor.org/stable/40376156>
- Bagchi, A. (1998). First Award of the Ninth Finance Commission: An Appraisal. *Economic and Political Weekly*, 23(49), 2593–2601.
- Bagchi, A. (2003). Rethinking Federalism: Changing Power Relations between the Center and the States. *Emerging Federal Process in India*, 33(4), 21–42.
- Bahl, R. (2002). *Implementation Rules for Fiscal Decentralisation*. New Delhi: Oxford University Press.
- Bahl, R. W., & Linn, J. F. (1992). *Urban public Finance in developing countries*. New York: Oxford University Press.
- Baldacci, E., Clements, B., Gupta, S., & Mulas- Granados, C. (2006). The phasing of fiscal adjustments : what works in emerging market economies? *Review of Development Economics*, 10, 612–631.
- Baltagi, B. (2008). *Econometric Analysis of Panel Data* (Third). Chichester, UK: Wiley and Sons.
- Bardhan, P. (2002). Decentralization of Governance and Development. *American Economic Association*, 16(4). Retrieved from <http://www.jstor.org/stable/3216920>
- Baron, D., & Ferejohn, J. (1989). Bargaining in legislatures. *American Political Science Review*, 83(4), 1181–1206.
- Barro, R., & Sala-i-Martin, X. (1995). *Economic Growth*. New York: McGraw Hill.

- Becker, G. (1983). A theory of competition among pressure groups for political influence. *Quarterly Journal of Economics*, (98), 371–400.
- Bhatt, A., & Scaramozzino, P. (2013). Federal Transfers and Fiscal Discipline in India: An Empirical Evaluation. *American Development Bank(ADB)Economics, Working Paper Series*, 343.
- Bhagat, C., (2017) GST a modern reform implemented with archaic sarkari attitude, here are five ways to set it right. Retrieved from <http://www.gstindia.com/gst-a-modern-reform-implemented-with-archaic-sarkari-attitude-here-are-five-ways-to-set-it-right/>
- Binswanger, H. P., Nagarajan, H., & Pradhan, C. (2012). The impact of restricted and unrestricted fiscal grants on tax efforts of Rural Local Governments in India. *NCAER Working Paper12*.
- Binswanger, H., Swaminathan, S., Aiyer, A., & de Regt, J. (2009). *Historical Roots of Community-driven Development*. Washington DC: World Bank.
- Bird, R. M., & Tarasov, A. (2002). Closing the Gap: Fiscal Imbalances and Intergovernmental Transfers in Developed Federations. *International Studies. Andrew Young School of Policy Studies, Georgia State University. Working Paper No.02-2*.
- Bird, R. M., & Vaillancourt, F. (1998). *Fiscal Decentralisation in Developing Countries*. Cambridge, U.K.: Cambridge University Press.
- Bird, R. M., & Wallich, C. (1992). *Fiscal Decentralization and Intergovernmental relation in transitional economies: towards a systematic framework of analysis*. Washington D.C.: The World Bank.
- Bird, R., & Smart, M. (2002). Intergovernmental Fiscal Transfers: International Lessons for Developing Countries. *World Development*, 30(6), 899–912.
- Biswas, R., & Marjit, S. (2014). *Fiscal Federalism, State Lobbying and Discretionary Finance: Evidence from India*. Paper presented at IDEP-GREQAM Conference,

- Marseille, June 14-15. Retrieved from
<http://polis.unipmn.it/seminari/workshopLawEconomics/files/biswas.pdf>
- Blochliker, H., & Campos, J. M. (2011). Tax Competition between Sub-Central Governments. *OECD Economics Department Working Papers, No. 872*, OECD Publishing.
- Blochliker, H., Merk, O., Charbit, C., & Mizell, L. (2007). Fiscal Equalization in OECD Countries. *OECD Network on Fiscal Relations across Levels of Government. Working Paper, No. 4*. Retrieved from <https://www.oecd.org/ctp/federalism/39234016.pdf>
- Boadway, R. (2004). The Theory and Practice of Equalization. *CESifo Economic Studies, 51*(1), 211–254.
- Boadway, R., & Hayashi, M. (2004). An Evaluation of the Stabilization Properties of Equalization in Canada. *Canadian Public Policy, 30*(1), 91–109.
- Boadway, R., & Shah, A. (2007). *Intergovernmental fiscal transfers principles and practice, public sector accountability and governance series*. Washington DC: World Bank. Retrieved from <https://openknowledge.worldbank.org/handle/10986/7171>
- Brennan, G., & Buchanan, J. M. (1980). *The Power to Tax: Analytical Foundations of a Fiscal Constitution*. Cambridge UK: Cambridge University Press.
- Breusch, T., & Pagan, A. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *Review of Economic Studies, 47*, 239–253.
- Buettner, T., & Wildasin, D. (2006). The Dynamics of Municipal Fiscal Adjustment. *Journal of Public Economics, 90*, 1115–1132.
- BS. (2015). Niti Aayog meet: States want more money, flexibility. *Business Standard*. New Delhi. Retrieved from http://wap.business-standard.com/article/economy-policy/niti-aayog-meet-states-want-more-money-flexibility-115020900019_1.html
- CAG. (2006). *Audit report of local government , 2006-07*. Comptroller and Auditor General of India.

- CAG. (2010). *Audit report of local government , 2010-11*. Comptroller and Auditor General of India.
- Cameron, A., & Douglas, L. (2015). A Practitioner's Guide to Cluster-Robust Inference. UC Davis. Retrieved from http://cameron.econ.ucdavis.edu/research/Cameron_Miller_JHR_2015_February.pdf
- Cantarero, D., & Pascual, M. (2008). Analyzing the impact of fiscal decentralization on health outcomes: empirical evidence from Spain. *Applied Economic Letters*, 15, 109–111.
- Cao, J., & Luo, L. (2006). The experimental analysis of fiscal equalization effect of transfers. *Statistical Research*, 1, 43–45.,
- CoI. (2001). Population density. Provisional population totals . Census of India, 2001. Web edition. Series 1
- Chatterjee, R. (2015). Planning Commission gets a new avatar: NITI Ayog. *The Huffington Post*. Retrieved from http://www.huffingtonpost.in/2015/01/01/neeti-ayog_n_6402998.html
- Chelliah, R. (1991). *Towards a Decentralized Polity*. Lecture presented at the L. K. Jha Memorial Lecture, Fiscal Research Foundation, New Delhi.
- Collin, C., & Green, A. (1994). Decentralization and Primary health care: some negative implications in developing countries. *International Journal of Health Services*, 24, 459–475.
- Collins, D. (2002). The 2000 Reform of Intergovernmental Fiscal Arrangements in Australia. International Symposium on Fiscal Imbalance: A Report. Canada: Commission on Fiscal Imbalance. (pp. 113–144).
- Courchene, T. (1984). *Equalization Payments: Past, Present, and Future*. Toronto: Ontario Economic Council.

- Courchene, T. (1994). *Social Canada in the Millennium: Reform Imperatives and Restructuring Principles*. Toronto: C.D. Howe Institute.
- Courchene, T. (1998). *Renegotiating Equalization*. Presented at the National Polity Federal State, International Economy, Toronto: C.D. Howe Institute.
- Cowell, F. (1995). *Measuring inequality* (2nd ed.). London: Prentice Hall.
- Dahlberg, M., Mork, E., Rattso, J., & Agren, H. (2007). Using a Discontinuous Grant Rule to Identify the Effects of Grants on Local Taxes and Spending. *CESifo Working Paper, No. 1857*.
- Dahlby, B., & Wilson, L. (1994). "Fiscal Capacity, Tax Effort and Optimal Equalization Grants. *The Canadian Journal of Economics*, 27(3), 657–672.
- Dahlby, & Warren, N. (2003). The Fiscal Incentive Effects of the Australian Equalization system. *Economic Record*. 79(247).
- Dasgupta, D., Maiti, P., Mukherjee, R., Sarkar, S., & Chakrabarti, S. (2000). Growth and Interstate Disparities in India. *Economic and Political Weekly*, 35(27), 2413–2422.
- Dash, B., & Raja, A. (2013). Intergovernmental Transfers and Tax Collection in India: Does the Composition of Transfers Matter? *Public Budgeting and Finance*, 33(2), 93–116.
- Davoodi, H., & Zou, H.F. (1998). Fiscal Decentralization and Economic Growth: A Cross-Country Study. *Journal of Urban Economics*, 43, 244–257.
- Delors, J. (1998). *Report on Economic and Monetary Union in the European Community*. Luxembourg. Presented by Committee for the Study of Economic and Monetary Union. Retrieved from <http://aei.pitt.edu/1007/>
- De Mello, L. R. (2000). Fiscal Decentralization and Intergovernmental Fiscal Relations: A Cross-Country Analysis. *Elsevier Science Ltd*, 28(2).
- Dessai, V. (2012). Importance of literacy in India's economic growth. *International Journal of Economic Research*, 312

- Dreze, J., & Sen, A. K. (1996). *India: Economic development and social opportunity*. Delhi: Oxford University Press.
- Ebel, R., & Yilmaz, S. (2002). Concept of Fiscal Decentralization and Worldwide Overview (International Symposium on Fiscal Imbalance: A Report) (pp. 145–174). Canada: Commission on Fiscal Imbalance.
- Ebel, R., & Yilmaz, S. (2004). *On the Measurement and Impact of Fiscal Decentralization*. Washington DC: Urban Institute.
- EPWRF (Various Years). Economic and Political Weekly Research Foundation. State Finances.
- EC (2015). Statistical Report on General Elections to State Legislative Assembly. Election Commission of India. Retrieved from http://eci.nic.in/eci_main1/ElectionStatistics.aspx
- ET. (2012). Economic measures will help reduce fiscal deficit: Pranab Mukherjee. *Economic Times*. Retrieved from http://articles.economictimes.indiatimes.com/2012-11-14/news/35110789_1_fiscal-deficit-multi-brand-insurance-sector
- ET. (2014). Reserve Bank of India's best toll to control Inflation: Raghuram Rajan. *Economic Times*. Retrieved from <http://economictimes.indiatimes.com/news/economy/policy/reserve-bank-of-indias-best-tool-to-control-inflation-is-interest-rate-raghuram-rajana/articleshow/35168968.cms>
- ET. (2016). V. Narayanaswamy criticises move to dismantle National Development Council. *Economic Times*. Retrieved from <https://economictimes.indiatimes.com/news/politics-and-nation/v-narayanaswamy-criticises-move-to-dismantle-national-development-council/articleshow/50408857.cms>
- Eyraud, L., & Lusinyan, L. (2013). Vertical fiscal imbalances and fiscal performance in advanced economies. *Journal of Monetary Economics*, 60, 571–587.

- Ezcurra, Roberto, & Pascual, P. (2008). Fiscal decentralization and regional disparities: Evidence from several European Union countries. *Environment and Planning*, 40, 1185–1201.
- Faguet, J. (2004). Does decentralization increase government responsiveness to local needs? Evidence from Bolivia. *Journal of Public Economics*, 88(3-4), 867–893.
- Falch, T., & Fisher, J. (2012). Public sector decentralization and school performance: International evidence. *Economics Letters*, 114, 276–279.
- Fan, S., Zhang, L., & Zhang, X. (2004). Reform, investment and poverty in rural China. *Economic Development and Cultural Change*, 52(2), 395–422.
- FC. (various years). *Finance Commission of India Reports*. New Delhi: Finance Commission of India.
- FC. (2000). *Report of the Eleventh Finance Commission (2000-2005)*. Finance Commission of India.
- FC. (2004). *Report of the Twelfth Finance Commission (2005-2010)*. New Delhi: Finance Commission of India.
- FC. (2009). *Thirteenth Finance Commission Report (2010-2015)*. Finance Commission of India.
- Feld, L., Baskaran, T., & Schnellenbach, J. (2007). *Fiscal Federalism Decentralization and Economic Growth : A Meta Analysis*. University of Heidelberg. Econstor. Working Paper No.16/02. Retrieved from <https://pdfs.semanticscholar.org/4863/8b8d854250ac9acf12e853dcbe620c7ed0bc.pdf>
- Galiani, & Schargrotsky. (2002). Evaluating the impact of school decentralization on educational quality. *Economia LACEA*, 2, 275–314.
- Garg, S., Goyal, A., & Pal, R. (2014). *Why Tax Effort Falls Short of Capacity in Indian States: A Stochastic Frontier Approach*. Working Paper No. 32, Indira Gandhi Institute of Development Research, Mumbai.

- Gemmell, N., Kneller, R., & Sanz, I. (2013). Fiscal Decentralization and Economic Growth: Spending Versus Revenue Decentralization. *Economic Inquiry*, 51(4), 1915–1931.
- Ghosh, A., Roy, Y., & Nayar, A. (2012). Debt burden of State Governments remains considerable; however, a back-ended repayment pattern would support liquidity in the medium term. *ICRA* Retrieved from <https://www.moneycontrol.com/news/business/stocks/-1892953.html>
- GoG.(Various Years). *Statistical Handbook of Goa*. Directorate of Planning Statistics and Evaluation. Panaji: Printing Press, Government of Goa.
- GoI. (n.d.). National literacy mission and women’s empowerment. Retrieved from www.nlm.nic.in/women.htm
- GoI. (Various Years). Ministry of Finance. State Debt & Liabilities : Outstanding Debt of States as at the end of the Year. Retrieved February from http://finmin.nic.in/the_ministry/dept_expenditure/plan_finance/DEbt/state-fiscal-debt-liab.asp
- GoI. (2004). Ministry of Finance. Estimation of tax buoyancies. Retrieved from finmin.nic.in/reports/8.pdf
- GoI. (2013). Total expenditure of the central government. Retrieved from data.gov.in
- GoI. (2015) india.gov.in, national portal of India, Constitution of India Article 246, Seventh Schedule. Retrieved from https://www.india.gov.in/sites/upload_files/npi/files/coi-eng-schedules_1-12.pdf
- GoI. (2017). Union– State Relations. Ministry of Law and Justice. Retrieved from <http://www.lawmin.nic.in/ncrwc/finalreport/v1ch8.htm>
- GoI. (2017) Inter-State Council. Ministry of Home Affairs. Retrieved from interstatecouncil.nic.in.

- Goodspeed, T. (2002). Bailouts in a federation. *International Tax and Public Finance*, 9, 409–421.
- Greene, W. (2010). Models for panel data. Retrieved from people.stern.nyu.edu/wgreene/Lugano2013/Greene-Chapter-11.pdf
- Grossman, P. (1994). A Political Theory of Intergovernmental Grants. *Public Choice*, 78, 295–303.
- Gupta, A. (2007). Determinants of Tax Revenue Efforts in Developing Countries. *International Monetary Fund Working Paper No. 07/184*. Retrieved from <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Determinants-of-Tax-Revenue-Efforts-in-Developing-Countries-21040>
- Habibi, N., Huang, C., Miranda, D., Murillo, V., Ranis, G., & Sarkar, M. (2003). Decentralization and development in Argentina. *Journal of Human Development*, 4(1).
- Hausman, J. (1978). Specification tests in econometrics. *Econometrica*, 46, 1251–1271.
- Hindricks, J., Peralta, S., & Weber, S. (2008). Competing in taxes and investment under fiscal equalization. *Journal of Public Economics*, 92(12)
- Hoshino, M. (2011). Measurement of GDP per capita and regional disparities in China, 1979-2009. Research Institute for Economics and Business Administration, Kobe University. Discussion Paper Series No. 2011-17. Retrieved from <http://www.rieb.kobe-u.ac.jp/academic/ra/dp/English/DP2011-17.pdf>
- Hsiao, C. (2003). *Analysis of Panel Data* (Second Edition). Cambridge University Press: Cambridge.
- Hsiao, C. (2006). Panel Data analysis – Advantages and Challenges. Wang Yanan Institute for Studies in Economics, Xiamen University. Retrieved from https://www.uio.no/studier/emner/sv/oekonomi/ECON5103/v10/undervisningsmateriale/PDApp1_14.pdf

- HT. (2014). PM Narendra Modi scraps Planning Commission. *Hindustan Times*. New Delhi. Retrieved from <https://www.hindustantimes.com/india/pm-narendra-modi-scraps-planning-commission/story-EJdGN4v0ETFV1SJZEeFy1J.html>
- Huan, B., & Chen, K. (2012). Are intergovernmental transfers in China equalizing? *China Economic Review*, 23, 534–551.
- Hunter, J. (1997). *Federalism and Fiscal Balance*. Canberra: Australian National University Press.
- Iamsiraroj, S., & Doucouliagos, H. (2015). Does Growth Attract FDI? Alfred Deakin Research Institute and Department of Economics, Deakin University, Australia. Retrieved from www.economics-ejournal.org/economics/discussionpapers/2015-18/file
- idre. (2017). Regression with STATA Chapter 4 beyond OLS. UCLA Retrieved from <http://www.ats.ucla.edu/stat/stata/webbooks/reg/chapter4/statareg4.htm>
- Indiastats. (Various Years). Selected State-wise Revenue and Expenditure of Panchayati Raj Institutions and Urban Local Bodies (All Tiers) in India (1998-1999 to 2002-2003).
- IE. (2017). Did Arvind Panagariya lose the turf war within Niti Aayog? Indian Express Retrieved from <https://www.google.co.in/amp/www.newindianexpress.com/thesundaystandard/2017/au/g/06/did-arvind-panagariya-lose-the-turf-war-within-niti-aayog-1638961.amp>
- Jha, R., Nagarajan, H. K., & Tagat, A. (2015). Restricted and Unrestricted Fiscal Grants and Tax Effort of Rural Local Governments in India. *NCAER-IDRC Working Paper 2015/01 Series on Decentralization and Rural Governance in India*. Retrieved from https://crawford.anu.edu.au/acde/asarc/pdf/papers/2015/WP2015_01.pdf
- Jha, S. & Mathur, P.C. (1999). Introduction in *Decentralization and local politics* New Delhi: Sage Publications.
- Jimenez-Rubio, D. (2010). The impact of decentralization of health services on health outcomes: evidence from Canada. *Applied Economics*, 1–11.

- Jin, J., & Zou, H.-F. (2002). How does fiscal decentralization affect aggregate, national, and subnational government size? *Journal of Urban Economics*, 52, 270–293.
- Jin, J., & Zou, H.-F. (2005). Fiscal decentralization, revenue and expenditure assignments, and growth in China. *Journal of Asian Economics*, 16, 1047–1064.
- Jin, Y. (2009). A Comparative Study of Fiscal Decentralization in China and India. Economic Dissertations. Department of Economics. Georgia State University. Retrieved from https://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1061&context=econ_diss
- Jin, Y., Ligthart, J., & Rider, M. (2011). The Evolution of Fiscal Decentralization in China and India: A Comparative Study of Design and Performance. *Journal of Emerging Knowledge on Emerging Markets*, 3.
- Justin, L., & Zhiqiang, L. (2000). Fiscal Decentralization and economic growth in China. *Economic Development and Cultural Change* 49(1).
- Kalirajan, K., & Otsuka, K. (2012). Fiscal Decentralization and Development Outcomes in India: An Exploratory Analysis. *World Development*, 40(8), 1511–1521.
- Kalirajan, K., & Takahiro, A. (1998). Institutions and interregional inequalities in India: finding a link using Hayami's thesis and convergence hypothesis. *The Indian Economic Journal*, 49(4).
- Karmali, D. (2015). *A study of Status and Potentialities of Panchayat Finance in Goa*. Goa: Goa Institute of Rural Development & Administration. Retrieved from <https://gipard.gov.in/wp-content/uploads/2015/07/Panchayat-Financance-in-Goa.pdf>
- Kaur, B., Misra, S., & Suresh, A.K. (2013). Cyclicity of social expenditures: evidence from Indian states. *Reserve Bank of India Occasional Papers* 34(1).
- Kennedy, P. (2003). *A guide to econometrics*. Cambridge MIT Press.
- Khemani, S. (2003). Partisan Politics and Intergovernmental Transfers in India. Policy Research Working Paper No. 3016. Washington D.C: The World Bank.

- Khemani, S. (2006). Local government Accountability for Health Service Delivery in Nigeria. *Journal of African Economies*, 15(2), 285– 312.
- Knight, J., & Li, S. (1999). Fiscal decentralization: Incentives, redistribution and reform in China. *Oxford Development Studies*, 27(1), 5–31.
- Thakur, A., & Kumāra, D. (2008). *Gender empowerment and development*. Edited on behalf of the Indian Economic Association. New Delhi : Deep & Deep.
- Laakso, M. & Taagepera R. (1979): Effective Number of Parties: A Measure with Application to West Europe. *Comparative Political Studies* 12:3-27.
- Lahiri, A.K. (2000) Practising sub-national public finance in India. *Economic and political weekly*, 35(18).
- Lessmann, C. (2009). Fiscal decentralization and regional disparity : evidence from cross section and panel data. Dresden discussion paper in economics 08/09. Faculty of Business and Economics. Technische Universitat Dresden. Retrieved from <https://ideas.repec.org/p/zbw/tuddps/0809.html>
- Lindaman, K., & Thurmaier, K. (2002). Beyond Efficiency and Economy: An Examination of Basic Needs and Fiscal Decentralization. *Economic Development and Cultural Change*, 50(4), 915–934.
- Lin, J. Y., & Liu, Z. (2000). Fiscal Decentralization and Economic Growth in China. *Economic Development and Cultural Change*, 9(1), 1–21.
- Liu, Y., & Yamauchi, F. (2014). Population density, migration and returns to human capital and land : insights from Indonesia. *Science Direct*, 48, 182–93.
- Lockwood, B. (1999). Inter-Regional Insurance. *Journal of Public Economics*, 72(1), 1–37.
- Lou, J., Li, K., & Xiang, Z. (2002). *Intergovernmental Financial Distribution Relations in China: A Case Study*. Presented at the “The International Conference on Further Reform of Fiscal and Taxation System”, Beijing.

- Lyons, T. P. (1991). Inter provincial disparities in China : Output and Consumption 1952 to 87. *Economic Development and Cultural Change*, 39(3), 471–506.
- Ma, J. (1997). *Intergovernmental Fiscal Transfer: A Comparison of Nine Countries (Cases of the United States, Canada, the United Kingdom, Australia, Germany, Japan, Korea, India, and Indonesia)*. Macroeconomic Management and Policy Division, Economic Development Institute. Washington DC: The World Bank.
- Marinkov, M. (2013). The impact of aggregate revenue and expenditure assignments on economic growth: the case of provinces and municipalities in South Africa. Submission for the 2013/14 Division of Revenue, Financial and Fiscal Commission, Chapter 7.
- Mayer, M. (2010). Unbalanced panel data models, Baltagi textbook chapter 9. Department of Economics, University of Vienna.
- Martinez-vazquez, J., & McNab, R. M. (2003). Fiscal Decentralization and Economic Growth. *World Development*, 31(9), 1597–1616.
- Martinez-Vazquez, J., & Timofeev, A. (2007). Regional-local dimension of Russia’s fiscal equalization. *Journal of Comparative Economics*, 36, 157–176.
- Meloche, J., Vaillacourt, F., & Yilmaz, S. (2004). Decentralization or Fiscal Autonomy? What does really matter? Effects on growth and public sector size in European transition countries. World Bank. Retrieved from library1.nida.ac.th/worldbankf/fulltext/wps03254.pdf
- Merrouche, O. (2007). The long term effect of education spending decentralization on human capital in Spain. Uppsala University, Department of Economics. Retrieved from https://ideas.repec.org/p/hhs/uunewp/2007_003.html
- Mill, A. (1994). Decentralization and Accountability in the Health Sector from an International Perspective: What are the Choices. *Public Administration and Development*, 14, 281–292.

- Mukherjee, S. 2002, Modern economic theory, New Age International (P) Ltd Publishers, New Delhi.
- Mogues, T., Benin, S., & Cudjoe, G. (2009). *Do External Grants to Governments Discourage Own-Revenue Generation? A Look at Local Public Finance Dynamics in Ghana*. IFPRI Discussion Paper No.934.
- Morduch, J., & Sicular, T. (2002). Rethinking inequality decomposition, with evidence from rural China. *The Economics Journal*, 112, 93– 106.
- MOSPI, (Government of India). (Various Years). Gross State Domestic Product.
- Mukhopadhyay, H., & Kumar das, K. (2003). Horizontal Imbalances in India: Issues and Determinants. *Economic and Political Weekly*, 38(14), 1416–1420.
- Mukhopadhyay, P., & Chattopadhyay, S. (2014). *Evaluation of State Finances of Goa 2002-03 to 2011-12*. New Delhi: Fourteenth Finance Commission.
- Naganathan, M., & Sivagnanam, K. (2000). Federal Transfers and Tax Efforts of States in India. *The Indian Economic Journal*, 47(4), 101–110.
- Naper, L. (2010). Teacher hiring practice and educational efficiency. *Economics of Education Review*, 29, 658–668.
- Nerlove, M. (2002). *Essays in Panel Data Econometrics*. Cambridge: Cambridge University Press.
- Newey, W., & McFadden, D. (1994). Large sample estimation and hypothesis testing. In *McFadden, eds., Handbook of Econometrics* (4th ed., pp. 2213–2245). Amsterdam: Elsevier.
- Neyapti, B. (2010). Fiscal Decentralization and Deficits: International Evidence. *European Journal of Political Economy*, 26, 155–166.
- Oates, W. (1972). *Fiscal Federalism*. San Diego, California: Harcourt Brace Jovanovic.
- Oates, W. (1993). Fiscal decentralization and economic development. *National Tax Journal*, 2, 237–243.

- Oommen, M. A. (2006). Fiscal Decentralisation to the Sub-State Level Governments. *Economic and Political Weekly*, 41(10), 897–903.
- Ostrom, E., Schroeder, L., & Wynne, S. (1993). *Institutional incentives and sustainable development: Infrastructure policies in perspective*. Oxford: Westview Press.
- Pakes, A., & Griliches, Z. (1984). Estimating Distributed Lags in Short Panels with an Application to the Specification of Depreciation Patterns and Capital Stock Constructs. *Review of Economic Studies*, 51, 243–262.
- Panda, P. (2009). Central Fiscal Transfers and States' Own-Revenue Efforts in India: Panel Data Models. *The Journal of Applied Economic Research*, 3(3), 223–242.
- Pattanaik, F., & Nayak, N. (2014). Macroeconomic Determinants of Employment Intensity of Growth in India. *Margin: The Journal of Applied Economic Research*, 8(2), 137–154.
- PC. (2014). Basic Health Parameters (CBR, CDR & IMR) - State-wise Time Series Data. Planning Commission Data Tables. Retrieved from planningcommission.nic.in/data/datatable/index.php?data=datatab
- PC. (2004). Background information on Planning Commission. Planning Commission, Government of India. Retrieved from planningcommission.gov.in/background_note_on_New_Institution.pdf
- PC. (2005). State finances. Uttar Pradesh development Report, Planning Commission Government of India. *Volume 2*
- PC, (2008). *Eleventh five year plan 2007-2012 , Volume I-inclusive growth*. New Delhi: Oxford University Press,
- Peabody, J., Rahman, M., Gertler, P., Mann, J., Farley, D., & Carter, G. (1999). *L, Policy and Health: Implications for Development in Asia*. Cambridge UK: Cambridge University Press.
- Porto, A., & Sanguinetti, P. (2001). Political determinants of intergovernmental grants: evidence from Argentina. *Economics and Politics*, 33(3), 237–256.

- Princeton University Library. (2015). Data and Statistical Services. Retrieved from http://dss.princeton.edu/online_help/stats_packages/stata/panel.htm
- Prud'homme, R. (1995). The dangers of decentralization. *World Bank Research Observer*, 10(2), 201–220.
- Qiao, B., Martinez-Vazquez, J., & Xu, Y. (2008). The trade-off between growth and equity in decentralization policy: China's experience. *Journal of Development Economics*, 86(1), 112–128.
- Rangarajan, C., & Srivastava, D. (2004). Fiscal Transfers in Canada: Drawing Comparisons and Lessons. *Economic and Political Weekly*, 39(19), 1897–1909.
- Rangarajan, C., & Srivastava, D. (2008). Reforming India's Fiscal Transfer System: Resolving Vertical and Horizontal Imbalances. *Economic and Political Weekly*, 43(23), 47–60.
- Rao, G. (n.d.). Fiscal Decentralization to Rural Local Governments in India: Selected Issues and Reform Options.
- Rao, G. (2000). *Fiscal Decentralization in Indian Federalism*. Bangalore: Institute for Social and Economic Change.
- Rao, G., Amar Nath, H., & Vani, B. . (2004). *Fiscal Decentralisation in Karnataka – A study of Rural Local Bodies* (Geetha Sethi ed. —Fiscal Decentralisation in India). New Delhi: Oxford University Press and World Bank.
- Rao, G., & Chelliah, R. (1991). *Survey of Research on Fiscal Federalism in India*. Volume 2 of monograph series. New Delhi: National Institute of Public Finance and Policy.
- Rao, G., Raghunandan, T. R., Gupta, M., Datta, P., & Jena, P. R. (2011). Fiscal Decentralization to Rural Local Governments in India: Selected Issues and Reform Options. New Delhi: National Institute of Public Finance and Policy. Retrieved from http://www.nipfp.org.in/media/medialibrary/2013/08/Fiscal_Decentralization_to_Rural_Local_Governments_in_India.pdf

- Rao, G., & Singh, N. (1999). *How to Think About Local Government Reform in India*. Presented at the conference on Second-Generation Indian Economic Reforms, December 8-10. Madras School of Economics, Chennai. Retrieved from http://southasia.berkeley.edu/sites/default/files/shared/events/2007_Indian_Democracy/nirvikar_singh-3.pdf
- Rao, G., & Singh, N. (2001). The Political Economy of Center-State Fiscal Transfers in India. *Center for International Development, Stanford, Working Paper No. 107*. Retrieved from <https://pdfs.semanticscholar.org/2a70/ffd0ccba20d508b8d1889350d2d5d0952813.pdf>
- Rao, H. (1989). Decentralized planning: an overview of experience and prospects. *Economic and Political Weekly*, 24, 411–416.
- Rao, G. (2015). Central transfers to states in India, Rewarding performance while ensuring equity. Final report of a study submitted to the Niti Aayog. Retrieved from www.niti.gov.in
- Rao, K. (2017) GST tax structure ready; how will it impact economy and various sectors. *Economic Times*. Retrieved from economictimes.indiatimes.com/articleshow/57355477.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst
- Raychaudhuri, A., & Roy, P. (2013). Report on Estimating True Fiscal Capacity of States and Devising a Suitable Rule for Granting Debt Relief based on Optimal Growth Requirement. Sponsored by Fourteenth Finance Commission, India.
- RBI. (2006). Fiscal Federalism – A Comparative Cross Country Analysis. Retrieved from <https://www.rbi.org.in/scripts/PublicationsView.aspx?Id=9025>
- RBI. (2013). Real Interest Rate impact on Investment and Growth – What the Empirical Evidence for India Suggests? Reserve Bank of India. Retrieved from <https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/IDGSR08082013.pdf>

- RBI (2014). Direct and Indirect Taxes of Central and State Governments. Reserve Bank of India. Retrieved from <https://www.rbi.org.in/scripts/AnnualReportPublications.aspx?Id=685>
- RBI (2016) Quality of sub-national public expenditure. Reserve Bank of India (Publications). Retrieved from m.rbi.org.in/scripts/PublicationsView.aspx?id=16834
- Riker, W. (1987). *The Development of American Federalism*. Boston: Kluwer Academic Publishers.
- Robalin, D., Picazo, O., & Voetberg, A. (2001). *"Does Fiscal Decentralization Improve Health Outcome? Evidence from a cross country analysis* (Working Paper No. 2565). World Bank Country Economics Department: World Bank
- Rodden, J. (2003). Reviving Leviathan: Fiscal Federalism and the Growth of Government. *International Organization*, 57(4), 695–729.
- Rodden, J., Eskelund, G., & Litvack, J. (2003). *Fiscal Decentralization and the Challenge of Hard Budget Constraints*. Cambridge, MA: MIT Press.
- Rodden, J., & Wibbels, E. (2002). Beyond the Fiction of Federalism: Macroeconomic Management in Multitiered Systems. *World Politics*, 54, 494–531.
- Rondinelli, D., & Nellis, J. R. (1986). Assessing Decentralization Policies in Developing Countries : The Case for Cautious Optimism. *Development Policy Review*, 4, (3)–23.
- Rubin, J., Taylor, J., Krapels, J., Sutherland, A., Felician, M., Liu, J., Davis, L., & Rohr, C. (2016). Are better health outcomes related to social expenditure? A cross- national empirical analysis of social expenditure and population health measures. Santa Monica, California: Rand Corporation. Retrieved from https://www.rand.org/content/dam/rand/pubs/research_reports/RR1200/RR1252/RAND_RR1252.pdf

- Schaffer, M. ., & Stillman, S. (2014). Help for xtoverid, Tests of overidentifying restrictions. Academic sites originally hosted by Faculty Microcomputer Resource Center. Retrieved from fmwww.bc.edu/repec/bocode/x/xtoverid.html
- Schaltegger, C., & Feld, L. (2009). Are fiscal adjustments less successful in decentralized governments? *European Journal of Political Economy*, 25, 115–123.
- Shah, A. (1994). The Reform of Intergovernmental Fiscal relations in Developing and Emerging Market Economies. World Bank. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.469.275&rep=rep1&type=pdf>
- Shah, A. (2006). *International Practices in Fiscal Equalization*. Presented at the International Workshop on Building New Countryside and Promoting Balanced Regional Development for a Harmonious Society, August 21-26. World Bank. Retrieved from <http://siteresources.worldbank.org/PSGLP/Resources/Shah.pdf>
- Sharma, C. (2006). Decentralization dilemma : measuring the degree and evaluating the outcomes, *Indian Journal of Political Science*. 67(1), 49–64.
- Shepsle, K. (1979). Institutional arrangements and equilibrium in multidimensional voting models. *American Journal of Political Science*, 28, 27–59.
- Singh, N., & Srinivasan, T. (2005). *Indian Federalism, Globalization and Economic Reform*. Cambridge, UK: Cambridge University Press.
- Singh, N., & Vashishtha, G. (2004). *Some Patterns in Centre-State Fiscal Transfers in India: An Illustrative Analysis, Working Paper No. 314*. Santa Cruz Center for International Economics: University of California.
- Sinha, A. (2012). *Changing Contours of Global Crisis- Impact on Indian Economy*. Presented at the Finance Summit, IIM, Kashipur. Retrieved from https://rbi.org.in/scripts/BS_SpeechesView.aspx?Id=678

- Singh, S.K., 2014, *Public Finance in theory and practice*. Ramnagar, New Delhi: S Chand and Company Pvt Limited.
- Snoddon, T. (2003). *On Equalization and Incentives: an Empirical Assessment*. Wilfred Laurier University, Waterloo, Canada.: Department of Business and Economics.
- Song, Y. (2013). Rising Chinese regional income inequality : the role of fiscal decentralization. *China Economic Review*, 27, 294–309.
- Soto, V., Farfan, M., & Lorant, V. (2012). Fiscal Decentralization and infant mortality rates : the colombian case. *Social Science and Medicine*, 74, 1426–1434.
- Sribney, W. (2013). Data Analyss and Statistica software. Retrieved January 3, 2016, from <http://www.stata.com/support/faqs/statistics/standard-errors-and-vce-cluster-option/>
- Srivastava, D., & Rao, B. . (2009). *Review of Trends in Fiscal Transfers in India entrusted by the Thirteenth Finance Commission*. Chennai: Madras School of Economics.
- Stata. (2005). Re: st: between overall within squared on xtreg. (Version 12)
- Stata. (2016). Extended instrumental variables/2SLS, GMM and AC/HAC, LIML and k-class regression (Version 12).
- Studenmund, A. (2000). *Using Econometrics: a practical guide* (4th ed.). Pearson Addison Wesley.
- Tanzi, V. (1987). *The theory of taxation for developing countries*. Oxford: Oxford University Press.
- The Hindu. (2015). NITI Aayog: States for greater devolution of funds. New Delhi. Retrieved from <http://www.thehindu.com/news/national/niti-aayog-states-demand-greater-financial-devolution-flexibility/article6871254.ece>
- Tiebout, C. (1956). A Pure Theory of Local Expenditure. *Journal of Political Economy*, 44.
- Torres -Reyna, O. (2007). *Panel Data Analysis fixed and random effects using Stata*. Presented at the Data and Statistical Services, Princeton University. Retrieved from : <https://www.princeton.edu/~otorres/Panel101.pdf>

- Trewartha, G. (1969). *A Geography of Population : World Patterns*. New York : John Wiley and Sons, Inc.
- Tsui, K. (2005). Local tax system, intergovernmental transfers and China's local fiscal disparities. *Journal of Comparative Economics*, 33(1), 173–196.
- UNDP 2015, Gender Equality in Human Development – Measurement. Development Report Office. Retrieved from http://hdr.undp.org/sites/default/files/hdro_issue_paper_on_gender_indices_with_cover.pdf
- Vithal, B. P. R., & Sastry, M. (2001). *Fiscal Federalism in India*. New Delhi: Oxford University Press.
- Weingast, B. (1979). A rational perspective on congressional norms. *American Journal of Political Science*, 23, 245–262.
- Weingast, B., Shepsle, K., & Johnsen, C. (1981). The political economy of benefits and costs: a neoclassical approach to distributive politics. *Journal of Political Economy*, 89, 642–654.
- Wooldridge, J. (2002). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.
- Wooldridge, J. (2010). *Introductory Econometrics* (4th ed.). Taylor and Francis.
- World Bank. (1997). *The State in a Changing World* (World Development Report). Washington DC: World Bank.
- World Bank. (2000a). Overview of rural decentralization in India, *Volume I* Retrieved from www1.worldbank.org/publicsector/civilservice/june2004seminar/RuralDecent.pdf
- World Bank. (2000b). *Overview of Rural Decentralization in India Volume II: Approaches to Rural Decentralization in Seven States*. Retrieved from www1.worldbank.org/publicsector/civilservice/june2004seminar/RuralDecent.pdf

- World Bank. (2002). *China National Development and Sub-national Finance: A Review of Provincial Expenditures* (No. 22951-CHA). Washington DC: World Bank.
- World Bank. (2004). *Making services work for poor people* (World Development Report). Washington DC: World Bank.
- World Bank. (2015). Measuring Inequality from Poverty. Retrieved from <http://www.worldbank.org/content/dam/Worldbank/document/Poverty%20documents/Inequality-In-Focus-0813.pdf>
- Worthington, A., & Dollery, B. (1998). The Political Determination of intergovernmental Grants in Australia. *Public Choice*, 94, 299–315.
- Wright, G. (1974). The Political Economy of New Deal Spending: An Econometric Analysis. *Review of Economics and Statistics*, 56, 30–38.
- Xie, D., Zou, H.-F., & Davoodi, H. (1999). Fiscal Decentralization and Economic Growth in the United States. *Journal of Urban Economics*, 45, 228–239.
- Yao, Y. (2009). The Impact of Fiscal Decentralization on Growth, Inequality and Local Governance in Rural China. Dissertation presented to the graduate school of Cornell University. Retrieved from https://ecommons.cornell.edu/bitstream/handle/1813/11223/All_Aug%208.pdf;sequence=1
- Yu, Q., & Tsui, K. (2005). Factor decomposition of sub-provincial fiscal disparities in China. *China Economic Review*, 16(4), 403–418.
- Zhang, B. (2006). *On Measuring the Scale and Effects of Fiscal Equalization Grants in China*. Paper presented at the Association for Chinese Economic Studies presented at the ACESA, Australia.
- Zhang, T., & Zou, H.-F. (1998). Fiscal decentralization, public spending, and economic growth in China. *Journal of Public Economics*, 67, 221–240.

- Zhang, T., & Zou, H.-F. (2001). The growth Impact of inter-sectoral and intergovernmental allocation of public expenditure with applications to China and India. *China Economic Review*, 58–81.
- Zhang, X. (2006). Fiscal decentralization and political centralization in China: Implications for growth and inequality. *Journal of Comparative Economics*, 34, 713–726.
- Zhao, Z. (2009). China's fiscal decentralization and provincial-level fiscal disparities: Decomposing the inequity measures. *Public Administration Review*, 69, 67–74.
- Zhuravskaya, E. (2000). Incentives to Provide Local Public Goods: Fiscal Federalism, Russian Style. *Journal of Public Economics*, 76(3), 337–368.

Appendix

Appendix 7.1 Computed Values of Alternative Base Level Criteria : FC-XIII							
States	Population	Area (adjusted share)	Fiscal Capacity	Fiscal Discipline	Forest cover	FMR (2001)	FLR (2001)
1	2	3	4	5	8	6	7
Andhra Pradesh	8.01	7.13	6.12	7.62	1.67	5.37	2.54
Arunachal Pradesh	0.09	2.17	0.13	0.15	11.21	1.47	1.53
Assam	2.69	2.04	4.78	2.86	2.97	3.39	3.16
Bihar	7.76	2.44	16.29	6.05	0.66	2.66	0.85
Chhattisgarh	2.14	3.51	2.54	2.24	5.19	5.87	2.76
Goa	0.15	2.00	0.00	0.13	5.49	4.59	6.21
Gujarat	4.92	5.08	0.87	5.13	0.51	2.71	3.75
Haryana	1.85	2.00	0.00	1.80	0.20	0.64	1.85
Himachal Pradesh	0.64	2.00	0.55	0.93	3.09	4.91	5.04
Jammu & Kashmir	0.85	5.77	1.34	0.74	1.07	1.42	1.45
Jharkhand	2.62	2.07	3.39	1.99	2.81	3.67	0.85
Karnataka	5.40	4.98	3.17	5.68	2.05	4.77	3.50
Kerala	3.93	2.00	1.14	3.54	5.00	9.03	8.05
Madhya Pradesh	5.53	8.00	8.43	5.54	2.42	2.66	2.53
Maharashtra	9.28	7.98	0.01	9.87	1.72	2.80	4.98
Manipur	0.20	2.00	0.33	0.25	4.95	5.18	4.02
Meghalaya	0.19	2.00	0.28	0.18	7.91	5.09	3.89
Mizoram	0.06	2.00	0.08	0.08	5.43	3.39	7.89
Nagaland	0.10	2.00	0.15	0.11	6.67	1.79	4.17
Odisha	4.04	4.04	5.39	4.70	3.28	0.69	2.56
Punjab	2.50	2.00	0.28	2.48	0.26	5.09	4.45
Rajasthan	4.74	8.88	6.19	4.95	0.24	2.75	1.59
Sikkim	0.04	2.00	0.05	0.04	6.71	0.64	4.01
Tamil Nadu	7.59	3.37	2.99	7.61	1.81	5.78	4.60
Tripura	0.29	2.00	0.42	0.25	8.33	3.99	4.67
Uttar Pradesh	15.44	6.25	26.06	16.73	0.46	4.63	1.34
Uttarakhand	0.83	2.00	1.20	0.84	6.34	1.70	3.89
West Bengal	8.16	2.30	7.81	7.52	1.54	3.35	3.89

Appendix 7.2: Computed Values of Alternative Improvement Criteria: FC-XIII							
States	Population	Area (adjusted share)	Fiscal capacity	Fiscal Discipline	Forest cover	FMR	FLR
1	2	3	4	5	6	7	8
Andhra Pradesh	8.01	7.13	6.12	7.62	3.40	2.75	4.62
Arunachal Pradesh	0.09	2.17	0.13	0.15	2.35	15.60	3.60
Assam	2.69	2.04	4.78	2.86	3.12	5.51	3.03
Bihar	7.76	2.44	16.29	6.05	3.42	5.51	2.90
Chhattisgarh	2.14	3.51	2.54	2.24	3.23	1.84	6.37
Goa	0.15	2.00	0.00	0.13	1.19	-2.75	2.17
Gujarat	4.92	5.08	0.87	5.13	2.92	-6.42	2.61
Haryana	1.85	2.00	0.00	1.80	3.10	-1.84	1.36
Himachal Pradesh	0.64	2.00	0.55	0.93	3.82	-3.67	4.00
Jammu & Kashmir	0.85	5.77	1.34	0.74	3.89	-1.84	3.50
Jharkhand	2.62	2.07	3.39	1.99	3.74	8.72	4.31
Karnataka	5.40	4.98	3.17	5.68	2.98	2.29	3.29
Kerala	3.93	2.00	1.14	3.54	5.03	10.09	0.47
Madhya Pradesh	5.53	8.00	8.43	5.54	3.10	3.21	5.46
Maharashtra	9.28	7.98	0.01	9.87	3.37	-5.51	3.84
Manipur	0.20	2.00	0.33	0.25	2.16	7.34	3.37
Meghalaya	0.19	2.00	0.28	0.18	12.27	7.80	3.84
Mizoram	0.06	2.00	0.08	0.08	0.00	6.42	2.14
Nagaland	0.10	2.00	0.15	0.11	4.81	6.42	1.75
Odisha	4.04	4.04	5.39	4.70	3.25	-2.75	4.13
Punjab	2.50	2.00	0.28	2.48	3.12	0.46	3.40
Rajasthan	4.74	8.88	6.19	4.95	3.14	5.05	6.14
Sikkim	0.04	2.00	0.05	0.04	5.66	-1.38	3.58
Tamil Nadu	7.59	3.37	2.99	7.61	3.66	5.96	3.42
Tripura	0.29	2.00	0.42	0.25	2.19	1.38	3.97
Uttar Pradesh	15.44	6.25	26.06	16.73	3.18	11.93	4.65
Uttarakhand	0.83	2.00	1.20	0.84	3.70	10.09	4.70
West Bengal	8.16	2.30	7.81	7.52	4.21	7.80	3.40

Appendix 7.3: Computed Values of Alternative Base Level Criteria : FC-XIV							
States	Population 1971	Population 2011	Area adjusted	Income distance	Forest cover	FMR	FLR
1	2	3	4	5	6	8	7
Andhra Pradesh	8.01	7.11	7.13	5.99	1.76	5.57	1.57
Arunachal Pradesh	0.09	0.12	2.17	0.06	11.20	2.88	1.28
Assam	2.69	2.62	2.03	4.04	2.93	3.86	3.06
Bihar	7.76	8.75	2.44	13.92	0.69	1.91	0.12
Chhattisgarh	2.14	2.15	3.51	2.44	5.18	5.47	1.80
Goa	0.15	0.12	2.00	0.08	5.47	4.59	6.87
Gujarat	4.92	5.08	5.09	1.68	0.51	1.95	3.76
Haryana	1.85	2.13	2.00	1.03	0.20	0.49	2.98
Himachal Pradesh	0.64	0.58	2.00	0.12	3.10	4.54	5.05
Jammu & Kashmir	0.85	1.05	5.76	0.98	1.04	0.49	1.01
Jharkhand	2.62	2.77	2.07	3.70	2.76	3.37	0.81
Karnataka	5.40	5.13	4.97	4.16	2.05	4.59	3.43
Kerala	3.93	2.81	2.00	2.04	5.05	10.02	8.40
Madhya Pradesh	5.53	6.10	8.00	7.93	2.42	2.54	1.59
Maharashtra	9.28	9.44	7.98	2.38	1.72	2.44	5.05
Manipur	0.20	0.22	2.00	0.26	5.48	5.18	4.32
Meghalaya	0.19	0.25	2.00	0.18	8.11	5.37	4.43
Mizoram	0.06	0.09	2.00	0.05	5.14	4.74	7.82
Nagaland	0.10	0.17	2.00	0.10	6.53	2.54	5.09
Odisha	4.04	3.53	4.04	4.85	3.27	0.78	2.59
Punjab	2.50	2.33	2.00	1.18	0.26	4.89	3.97
Rajasthan	4.74	5.76	8.88	5.32	0.24	2.39	0.12
Sikkim	0.04	0.05	2.00	0.02	6.73	0.54	4.98
Tamil Nadu	7.59	6.06	3.37	2.65	1.81	5.72	4.53
Tripura	0.29	0.31	2.00	0.34	8.13	3.96	6.45
Uttar Pradesh	15.44	16.79	6.25	24.92	0.46	4.10	1.18
Uttarakhand	0.83	0.85	2.00	0.33	6.34	1.61	3.83
West Bengal	8.16	7.67	2.30	9.25	1.44	3.47	3.93

Appendix 7.4: Computed Values of Alternative Improvement Criteria : FC-XIV							
States	Population 1971	Population 2011	Area Adjusted	Income distance	Forest cover	FMR	FLR
1	2	3	4	5	6	8	7
Andhra Pradesh	8.01	7.11	7.13	5.99	4.76	4.01	2.69
Arunachal Pradesh	0.09	0.12	2.17	0.06	3.21	12.03	4.40
Assam	2.69	2.62	2.03	4.04	3.01	6.15	3.62
Bihar	7.76	8.75	2.44	13.92	4.02	-0.27	5.70
Chhattisgarh	2.14	2.15	3.51	2.44	3.37	0.54	2.57
Goa	0.15	0.12	2.00	0.08	3.25	3.21	2.88
Gujarat	4.92	5.08	5.09	1.68	3.63	-0.27	3.44
Haryana	1.85	2.13	2.00	1.03	3.62	4.81	6.25
Himachal Pradesh	0.64	0.58	2.00	0.12	3.66	1.07	2.63
Jammu & Kashmir	0.85	1.05	5.76	0.98	2.62	-0.80	4.15
Jharkhand	2.62	2.77	2.07	3.70	3.43	1.87	5.11
Karnataka	5.40	5.13	4.97	4.16	3.66	2.14	3.47
Kerala	3.93	2.81	2.00	2.04	4.11	6.95	1.30
Madhya Pradesh	5.53	6.10	8.00	7.93	3.59	3.21	2.76
Maharashtra	9.28	9.44	7.98	2.38	3.61	1.87	2.76
Manipur	0.20	0.22	2.00	0.26	10.12	2.94	3.68
Meghalaya	0.19	0.25	2.00	0.18	5.92	4.55	4.12
Mizoram	0.06	0.09	2.00	0.05	0.00	10.96	0.77
Nagaland	0.10	0.17	2.00	0.10	1.83	8.29	4.52
Odisha	4.04	3.53	4.04	4.85	3.48	5.08	4.18
Punjab	2.50	2.33	2.00	1.18	3.68	1.87	2.26
Rajasthan	4.74	5.76	8.88	5.32	3.65	1.87	2.54
Sikkim	0.04	0.05	2.00	0.02	3.67	4.01	4.70
Tamil Nadu	7.59	6.06	3.37	2.65	3.68	2.41	2.79
Tripura	0.29	0.31	2.00	0.34	0.89	3.21	5.51
Uttar Pradesh	15.44	16.79	6.25	24.92	3.65	0.27	4.64
Uttarakhand	0.83	0.85	2.00	0.33	3.54	3.74	3.22
West Bengal	8.16	7.67	2.30	9.25	2.38	4.28	3.37

