



Federal Fiscal Balances in India: Methods, New Estimates, and their Implications

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Abstract: This paper provides first-ever estimates of interregional fiscal flows in India for the period of 2001-2015. Estimates show that nearly 40 percent of the Indian population lives in the ‘donor’ or net contributing states, providing fiscal resources to rest of the country. In presence of wide regional disparities and small donor base, fiscal redistribution cannot succeed as a tool to reduce regional income inequalities. However, fiscal redistribution serves an important purpose in reducing regional fiscal inequalities by two-third. On measurement issues, paper contributes on regional allocation of federal fiscal deficit and interest payment on public debt. Issues related to double counting on these components are addressed, with clearer theoretical ground for their allocation.

JEL classification: H77, O53, R58

Key words: fiscal federalism, horizontal fiscal equity, federal fiscal balances, fiscal flows, regional redistribution

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1. Introduction

Fiscal activities of federal government invariably results in net interregional fiscal flows or the so called ‘federal fiscal balances’ at regional level. This redistribution takes place because, in most countries, the federal tax rates are uniform across country, translating into regional contribution in federal taxes proportional to income. Whereas transfers and government expenditures are made uniformly on per capita basis. Further, federal government may deliberately engage in providing higher per capita transfers to poorer regions to offset regional disparities in income or provision of government services. Hence, regions with lower income levels systematically receive net transfers from rest of the country. It is important to distinguish between two related concepts on fiscal federalism, namely intergovernmental transfers and interregional fiscal flows. Former refers to flow of resources from federal (centre) to provincial (state) governments.¹ Later, in addition to intergovernmental transfers, also takes in consideration direct expenditure by federal government and taxation side, with net flows termed as federal fiscal balances.

Efforts to estimate federal fiscal balances may be motivated by various objectives. Firstly, from the perspective of classical literature on fiscal federalism, interregional fiscal flows are essential for ensuring horizontal fiscal equity, avoiding fiscally induced migration, and creating common national market (Oates, 1968; Boadway and Flatters, 1982).² Estimates

¹ The terms ‘Union’ and ‘central’ government are used interchangeably, which refer to federal government in American context. Similarly, terms ‘provincial’ or ‘state’ government is used for subnational government. There is a third level of government in India namely, urban and rural local bodies. These are largely dependent upon state government funding for their operation. To the extent they receive direct transfers from central government, bypassing state budgets, they are relevant to purpose of this paper. They are included in component ‘local goods and transfers’ (Table 2, item 2d).

² Horizontal fiscal equity and fiscal capacity equalization are two different concepts. Former is concerned with equal treatment of equals (at individual level), while later talks about capacity of various subnational jurisdictions to provide comparable levels of public services at comparable tax rates. Despite this distinction, it is practically impossible to examine horizontal fiscal equity at the individual level. Literature in fiscal federalism uses the two terms interchangeably. Equalization of fiscal capacity across subnational units is a necessary but not sufficient condition for horizontal fiscal equity at individual level, with later also being dependent upon political economy within the subnational unit (Buchanan, 1950).

of federal fiscal balances can be used to assess role of central fiscal policy in addressing regional disparities (MacDougall, 1977; Bayoumi and Masson, 1995; Ruggeri and Yu, 2003). Secondly, these estimates can also be used to analyse role of central fiscal policy in macroeconomic stabilization at regional level (Bayoumi and Masson, 1995; Obstfeld and Peri, 1998; Bosch et al, 2003). Thirdly, federal transfers, expenditure, and taxation are integral part of the regional accounts and macroeconomic composition of subnational economies (EUROSTAT, 1999). Estimates of interregional fiscal flows are particularly important, since they are linked to transfer of purchasing power across states, directly influencing consumption, investment, and interstate trade patterns (Romans, 1965; Sethia, 2016). Essentially, these three motivations are in some sense linked to Musgrave's three objectives of government, namely resource allocation, redistribution, and macroeconomic stabilization. Finally, estimates of fiscal flows can also be prepared in presence of secessionist demands, though who (donor or recipient region) makes demand for secession largely depends upon other reasons such as ethnic, historical, and political factors.³

Interregional fiscal flows in India had received attention even during the pre-independence period, with legislatures from high tax paying provinces of Bengal and Bombay complaining about fiscal injustice.⁴ More than 50 percent of the expenditure by British government was on army and defence related activities, where soldiers were recruited from 'martial classes' mainly belonging to provinces of Punjab and NWFP. Given that soldiers received generous salary, pension, and infrastructure investment in their provinces, financed through taxes from poor nation; tax paying regions could sense their loss. Interregional fiscal

³ In Canada and the United Kingdom, secessionist pressures are exerted by 'recipient' regions, mainly on the basis of linguistic or historical basis. In contrast, in Spain, Italy, and Belgium, 'donor' regions exert such pressure since they can now access large common market of the European Union, without much fiscal cost to fund poorer regions (Rodden, 2009). Bosch et al (2010) provides a good cross-country survey on these issues.

⁴ For example Council of States debates, March 1, 1935, 541-552 (for this and other debates on this issue, see Wilkinson, 2015)

redistribution continued in the post-independence era, though the purpose changed from suppression of the nation through army to development of the nation. Efforts for nation building, process of planning, and goal of balanced regional development may have contributed to wider acceptance of interregional fiscal flows. Also, rule of single-party at both centre and most of the states for large part of the 30 years after independence may have developed acceptance of fiscal redistribution among policymakers. Not surprisingly, era of coalition government at centre and power wielded by regional parties at the state level have raised tensions regarding centre-state fiscal relations in the last three decades.⁵

While intergovernmental fiscal transfers have been widely studied in Indian federal system, associated interregional fiscal flows have not received similar attention. There are two good reasons for this research gap. Firstly, countries having active tradition of estimating interregional fiscal flows, such as Canada, Spain, Italy, Belgium, and the United Kingdom, also face secessionist threats focused around cultural differences along with dissatisfaction on sharing of fiscal resources among provinces/regions. While India has also faced secessionist threats in the state of Punjab, Nagaland, and Manipur, and faces continuous threats in Jammu and Kashmir, focus of the secessionist forces have been cultural differences with rest of the country rather than sharing of fiscal resources.⁶ Secondly, the data gaps on central transfers, expenditure, and taxation at regional level, particularly the last two components, may have acted as a major deterrent in attempting estimates of interregional fiscal flows.

This paper makes three contributions. First is focused on conceptual and measurement issues, as the methodology for allocating federal fiscal aggregates at regional level is far from settled, particularly in case of allocation of fiscal deficit and interest payment on public debt.

⁵ In a recent example, a richer state (with higher contribution in central tax pool) complained that “they (central government) give our money to States declared as underdeveloped (Hindu 2016)

⁶ In Punjab, sharing of river water, a crucial economic resource for the state, was also an issue but this was only an additional issue rather than the main focus of secessionists.

The paper provides a review of existing approaches for these two aspects, highlights issues involved with them, and provides new approaches with theoretical grounding. Second, and the most important contribution, is development of first ever estimates of federal fiscal balances for Indian states. Finally, the new estimates have been used to examine role of central fiscal policy in regional redistribution and fiscal capacity equalization.

State level estimates of central transfers, expenditure, and taxation have been prepared for the financial year 2000-01 to 2014-15.⁷ There are some justifications for the time period chosen. Firstly, there was a reorganization of Indian states in year 2000-01, taking total number of states from 25 to 28. There was again a reorganization of the states (bifurcation of a state) in 2014-15 taking total number of states to 29. Hence, this time period provides uniformity in the state composition. Secondly, this period coincide with the era of stable coalition governments, with sufficient time gap after the instability and economic reforms of 1991. This will make the estimates more interesting for those using it for analysing political economy of central-state fiscal relations. Finally, this period covers the high growth phase of Indian economy, hence researchers interested in analysing growth-redistribution linkages will find the estimates interesting. With all above justifications, there is no denial of desirability of an even longer time series, dating back to independence or preferably even before. With availability of such series, one may search for different patterns of fiscal flows associated with different policy regimes, such as army state under British rule, planning-phase during Nehru era, licence permit-raj during Indira's rule, and liberalization-coalition government phase that started in mid-80s. Those working on regional economics will also find such estimates of fiscal flows useful simply for the sheer quantum of resources involved. However, it becomes more challenging to prepare suitable indicators relevant for allocating federal fiscal activities as one

⁷ Financial year in India runs from 1st April to 31st March.

goes backward in time. The same aspects that make the longer time series desirable also creates difficulty for estimation, since pattern of central intervention and composition of programs changes over longer time period. Before engaging in that daunting project, author would like to receive comments on the measurement methods used in regional allocation of federal fiscal activities and the initial sets of estimates prepared for India. Nonetheless, estimates prepared would be useful for researchers analysing trajectory of Indian states in terms of economics and politics.

Rest of the paper is organized as follows. Section 2 provides a brief context on fiscal redistribution system in India. Section 3 outlines the methodological challenges for calculating federal fiscal balances, with approach and data sources to estimate the same. Section 4 uses the new estimates to analyse broad trends in interregional fiscal flows and their role in reducing regional income and fiscal disparities. Last section concludes the paper.

2. The Fiscal Redistribution System

In the spirit of classical literature on fiscal federalism, Indian constitution assigned most of the expenditure responsibilities to the state governments, while central government received powers to collect most of the taxes.⁸ In practice, centre collects nearly two third of the total taxes while incurs one third of total government expenditure. Case is opposite for the expenditure and revenue shares of state governments. This centralization of revenue collection and decentralization of expenditure inherently leads to vertical fiscal imbalance, requiring transfers of resources from centre to state governments. Indian federal system is also marked

⁸ Essentially, state governments being closer to the residents are assumed to have better information on local tastes and preferences on expenditure side. However, centralization of taxation is required to avoid potential tax competition among the state governments. Central government is assigned responsibility to provide national public goods, while state governments are required to make expenditure on local public goods and items with regional heterogeneity in preferences. Vertical imbalances (mismatch between revenues and expenditure of the two levels of government) are deliberately created in the federal systems. For economic theory behind this, see Oates, (1968).

by wide regional income disparities, which automatically lead to horizontal fiscal disparities, (where poorer states have lower tax base to finance government services than their richer counterparts). Table 1 shows that the ratio of per capita income between the richest and the poorest subnational regions (state/province) in Canada, Australia, and the USA are usually of the order of 2 to 2.5 only. In contrast, this ratio is around 5 in Indian federal system, even higher than the levels observed in other large developing federal economies like Brazil and China. However, in most developed countries as well as in China and Brazil, low income subnational jurisdictions are much smaller in terms of population compared to large donor regions. Case is opposite in India, where poorer states are also the most populous states of country. Clearly, this poses severe challenge and responsibility for the central government to engage in large interregional transfer of fiscal resources for achieving horizontal fiscal equalisation.

Table 1: Per Capita Income (PCI) in the Richest and the Poorest States in 2011 (\$ PPP)

S. No.	Item	USA	Canada	Australia	Germany	China	Brazil	India
1	PCI	49675	42198	46132	43189	10221	14831	4768
2	Richest state							
a	Name	Connecticut	Alberta	W. Australia	Hamburg	Jiangsu	São Paulo	Haryana
b	PCI	65861	65001	70671	71753	16430	22469	8576
c	% population	1.14	11.04	10.53	2.14	5.89	21.65	2.09
3	Poorest State							
a	Name	Mississippi	Nova Scotia	Tasmania	Mecklenburg-Vorpommern	Guizhou	Maranhão	Bihar
b	PCI	32477	32790	35245	29131	4344	5158	1639
c	% population	0.96	2.75	2.29	2.00	2.59	3.43	8.55
4	Ratio (2b/3b)	2.03	1.98	2.01	2.46	3.78	4.36	5.23

Notes:

1. PCI: Per capita income
2. % population denotes population share of the state in respective countries.
3. High income city states/provinces have been excluded for comparison.

Source: Compiled based on data from Official statistical agencies of respective countries. PPP Exchange Rate: Penn World Tables.

Interregional fiscal redistribution by central government operates through three main channels: i) intergovernmental fiscal transfers to subnational governments, ii) direct expenditure by central government, and iii) revenue collection to fund fiscal transfers and direct

expenditures. Most distinguishing feature of the intergovernmental transfers in India is presence of multiple channels of central transfers. Firstly, the Finance Commission recommends share of states in central taxes along with some grants-in-aid to states. These transfers are explicitly meant to address interstate fiscal disparities, evident as 50-60 percent weightage for regional disparities in the formula for interstate allocation of funds. Secondly, the Planning Commission⁹ provided grants to state governments based on economic and social priorities set at the national level. Though formula based allocation is made for only a small proportion of the Planning Commission grants (roughly 30 percent of the total), remaining discretionary funds were also allocated with great consideration to reduce regional disparities. Lastly, central ministries also provide grants to state governments for various central sector and centrally sponsored programmes.

In addition to above mentioned central transfers *routed through state budgets*, many components of direct central expenditure, *bypassing the state budgets*, also influence regional redistribution. Direct central expenditure can further be classified as: i) local goods and transfers, such as health, education, infrastructure, various subsidies, etc., ii) national public goods, such as provision of national defense, general administration, foreign affairs, etc., and iii) interest on public debt. Table 2 provides an overview of the average composition of various components of central transfers (excluding loans)¹⁰ and expenditure for three quinquenniums.

⁹ Unlike the Finance Commission, the Planning Commission was an extra constitutional body created in 1950 to guide planning process and allocate resources at both central and state levels. Current central government, elected in 2014, replaced Planning Commission with a new institution named NITI Aayog, formed on January 1, 2015. Unlike Planning Commission, NITI Aayog is expected to work only as an advisory body, without any financial powers for final allocation of funds among states.

¹⁰ Unlike transfers, loans are to be repaid hence should not be considered as a part of fiscal flows. There can be implicit redistribution through central loans, if the interest rates on these loans are lower than the market rates. Opposite case is also possible. India has seen both the cases. Finally, if the loans are waived off later due to economic or political considerations, they involve fiscal flows. These issue can be avoided here mainly because the practice of central loans to states has substantially been curtailed in the recent years (footnote 11).

Table 2: Composition of Central Transfers and Expenditure (as % of total)

S. No.	Item	2000-05	2005-10	2010-15
1	Transfer routed through State Budgets	25.3	28.6	30.7
a)	Finance Commission	17.3	19.6	20.8
b)	Planning Commission#	4.8	5.6	7.3
c)	Central Ministries	3.1	3.4	2.6
2	Direct Expenditure	74.7	71.4	69.3
d)	Local Goods and Transfers	22.6	27.9	27.4
e)	Pure Public Goods	24.5	23.3	22.2
f)	Interest on Public Debt	27.6	20.2	19.8
	Total as % of GDP	16.0	17.1	16.1

Source: Author's calculations based on Union Budget of India (GoI, 2016)

Planning Commission transfers covers only the grant component. Central loans to states are excluded.

Note: Data are average for each quinquennium

Transfer *routed through state budgets* account for around 25-30 percent of the total central disbursements. Decline in the share of direct expenditure is largely on account of interest payment on central government's public debt. Behind this trend there are some genuine factors, but mainly it is a result of various accounting reforms on central borrowings and lending.¹¹ Central expenditure on local goods and transfers (item d) is linked to education, health, infrastructure, various subsidies, etc., which directly influences welfare at regional level. Existing literature on fiscal federalism in India has limited itself to central transfers *routed through the state budgets* (Item 1). However, size of central government's expenditure

¹¹ On genuine side, there has been a significant fall in interest rate over years, with weighted interest rate on the central government's outstanding market loans declining from 9.3 percent in 2003-04 to 7.9 percent in 2009-10 (DEA, 2013). Also, there have been two important reforms in the transfer system to the states, having bearing on the accounting system of central government's fiscal deficit. These are related to treatment of the borrowings of states from NSSF (National Small Saving Funds, reformed in 1999-00) and loan component of central assistance to the state plans (reformed in 2005-06). In both the cases, central government was effectively borrowing to provide loans to the state governments. This created non-tax revenue receipt for the central government (from the states) but also raised its public debt and consequent interest payment on expenditure side. As a result of these reforms, loans to states declined from 50% of the central fiscal deficit in 1998-99 to practically zero in 2009-10. Ideally, in any study focused on public debt, one should measure central debt and its interest payment consistently by eliminating central loans to the states and associated interest expenditure. However, as discussed in section 3.1, it is unnecessary to allocate central interest payment on regional basis while analysing benefits/burden of interregional fiscal flows. Hence, for this paper, there is no need to attempt the consistent measurement of central public debt and interest payments.

bypassing state budgets, especially on account of local goods and transfers (item d), warrants overall assessment of interstate allocation of central transfers and expenditure.

Chakraborty et al (2010) is the only available study estimating interstate allocation of both central transfers *routed through state budgets* and direct expenditure on local goods and transfers *bypassing state budgets*. The study highlighted that different channels of central transfers and expenditure follow different patterns of interstate distribution. Specifically, central transfers *routed through state budgets* provide higher resources to poorer states but richer states get larger share in direct central expenditure. While the study explores available data sources comprehensively, most of the coverage for direct expenditure on local goods and transfers was limited to a single financial year (mostly 2006-07 or 2007-08). Also, regional incidence of central taxes (levied for creating common fiscal pool to be shared among central and subnational governments) forms another channel of interregional fiscal flows through central government's fiscal policy, which has not been explored in the Indian context. Present paper is novel in expanding the coverage and time series on expenditure side, and incorporating taxation side to measure federal fiscal balances in the Indian context.

3. Measurement Issues and Data sources

There are two conceptual issues for top-down allocation of federal fiscal activities. Firstly, one need to choose the approach for regional allocation of federal fiscal activity. Second, and more crucial issue is the scope of federal fiscal activities to be covered, particularly regarding national defense, public debt, and interest payment. Both these issues must be addressed while maintaining consistency with the purpose of allocation.

On first issue, two different approaches, namely cash flow approach and incidence/benefit approach, have often been used in empirical literature for regional allocation of federal fiscal

activities. Under cash flow approach, federal expenditures and revenue contribution are linked to location of expenditure/revenue collection. For example, expenditure on national defense would be allocated to regions where defense forces are located. Similarly, corporate income taxes would assume to be contributed by the states where taxes are collected, mainly large metropolitan cities housing corporate offices. Customs duty would also be allocated to the states with ports, from where international trade is carried out. This is clearly an administrative approach lacking economic rationale. Most statistical agencies, such as Statistics Canada (to publish Provincial Economic Accounts, PEA) and Department of Development Politics, Italy (for its project Conti Pubblici Territoriali, CPT), use this approach. There is little connection between the regional incidence of burden/benefits with the allocation carried out under cash flow approach. On the other hand, benefit approach focuses on location where individuals deriving benefits/burden of the federal fiscal activity reside. Clearly, this approach is more suitable when one is concerned about issues such as effect of federal fiscal activities on economic and fiscal disparities at regional level (Vaillancourt and Bird, 2007; Ruggeri, 2009).

Regarding the second issue, national public goods, interest payment on federal public debt, and federal fiscal surplus/deficit are three key challenges in defining scope of the exercise. This paper follows three principles while defining the scope for regional allocation of benefits and burden of federal fiscal policy. Firstly, the benefits and burden must be either in current year or clearly identifiable to particular region if they belong to past or future. Secondly, quantum of benefits and burden at the national level should be equal so as the sum total of net federal fiscal balances of all regions should be zero, which can be done by identifying intertemporal benefit/burden of fiscal surplus/deficit. This is necessary to avoid a possible scenario where all regions may appear to receive net fiscal inflows, if federal government is running large fiscal deficit. Finally, there should be no double counting, a very basic principle of accounting but not fully appreciated in the existing literature. Following these principles, issues of national

public goods, interest payment on public debt, and federal fiscal surplus/deficit are covered in section 3.1.2, 3.1.3, and 3.3 respectively.

At this point some clarifications are pertinent regarding the terminology used. This paper uses the terms benefits/burden interchangeably with expenditure/taxation, based on their linkages through regional incidence. While this is accepted practice in the literature, there are limitations to find perfect linkages between incidence and expenditure/taxation. Also, incidence approach can capture regional dimensions of benefits/burden only in a static sense. In the long run, interstate migration, intergenerational transfers, and regional terms of trade can substantially be influenced by federal fiscal activities. In such a scenario, richer regions also benefit from the government expenditures made in the poorer regions, while net fiscal benefits, estimated as federal fiscal balances, may potentially harm poorer regions (Desmet, 2002). This issue will be revisited in section 4.3, while discussing interpretation and limitations of federal fiscal balances. Another clarification required is with regard to scope of terms used for central transfers and expenditure. This paper uses term ‘direct expenditure’/‘expenditure’ to refer all spending made by central government, excluding transfers made to state governments. Another term, ‘disbursement’ is used to cover both direct expenditure and transfers to the state governments.

3.1 Disbursement

Following Table 2, central government’s disbursement can be classified into following components: i) transfers/grants routed through state budget, and ii) direct expenditure. First component would undoubtedly be part of any exercise calculating federal fiscal balances. State level data for these transfers have been taken from the Reserve Bank of India’s (RBI) study on State Finances (RBI, 2016). Second component, direct expenditure by central government, poses greater challenges both conceptually and on data required for estimation. Following

Table 2, direct expenditure can further be classified into: a) local goods and transfers, b) national public goods, and c) interest on public debt.

3.1.1 Local goods and transfers

Major items under this component are: subsidies on food, fertilizers, and petroleum products, agriculture, rural development, health, education, and infrastructure. Expenditures on these items have clear implications for regional welfare. By and large, direct benefits of these activities are also derived by the region where final expenditures are made. Certainly there are limitations to this interpretation, which are discussed in section 4.3.

Usual practice of allocating food subsidy is based on state-wise distribution of subsidized food grains to consumers (Chakraborty et al, 2010). However, this approach ignores that in India (as in most developed countries!!) food subsidy has twin objective of providing higher procurement prices to farmers while also giving assistance to poor consumers by issuing food-grains below procurement prices. The difference between procurement and issue prices along with transport and distribution cost constitutes food subsidy. Accordingly, food subsidy is allocated in three steps. Difference between procurement prices and production cost was taken as producer subsidy to farmers. Commission on Agricultural Cost and Prices (CACP) provides annual estimates of production cost of the food grains. At second stage, difference in production cost and issue price to consumers was taken as subsidy to consumers. Remaining subsidy is essentially for procurement and distribution incidentals. Share of producers and consumers in procurement and distribution cost would depend upon the relative elasticity of demand and supply of food-grains. While it is expected that it is the case of inelastic demand and inelastic supply, no reliable estimates of elasticities are available. The best choice in such

case is assumption of equal elasticities and equal incidence on both sides. Accordingly, incidentals were equally divided into consumers and producers.¹²

Issues of producer and consumer subsidy are applicable on fertilizer subsidy as well. Chakraborty et al (2010) allocated fertilizer subsidy among states based consumption of fertilizers. However, fertilizer subsidy keeps the production cost lower and hence also result in lower food prices (Gulati and Narayanan, 2003). Hence, consumers also benefit from fertilizer subsidy. Again, keeping in mind the unavailability of elasticity estimates, fertilizer subsidy is allocated equally between producers and consumers. For producers, fertilizer/nutrient consumption was taken as indicator. For consumers, consumption of rice and wheat was used, while taking fertilizer intensity for two crops in account.

Petroleum subsidy is largely meant for Kerosene and LPG for cooking purposes. Individual subsidy for both items along with state-wise consumption data from Ministry of Petroleum and Natural Gas was used for allocation of petroleum subsidy. It should be noted that in case of all three subsidies, many a times government has issued bonds instead of cash to the distribution companies to defer budgetary burden. Since the benefits belongs to current period, bonds have been taken in consideration while allocating subsidy amount. Remaining items of central expenditure on agriculture, rural development, education, health, transport, and communication were allocated based on program/scheme-wise data from various reports of the relevant central ministries/departments. Answers to parliament questions constituted a very important data source for this purpose. Some of the data on infrastructure expenditure by central government

¹² Although food prices differ across the country, central government provides food grains at uniform prices across the country for distribution through public distribution system (PDS). Effectively, consumers in the states with higher food prices in regional markets get higher transport subsidy for similar quantity of food grains. This idea has been captured by using the difference between market prices of food grains (estimated from household consumption surveys conducted by National Sample Survey Organization - NSSO) and Central Issue Price (CIP) of food grains as an indicator of per unit food subsidy. This was taken in account while allocating consumer part of the incidentals.

were taken from *regional accounts* of the states, which were supplied by the Central Statistical Organization (CSO) on request.

3.1.2 National public goods

Expenditure on national public goods, such as national defense, external affairs, general administration, etc., can invite marked differences in opinions for their regional allocation. If the purpose of allocation of federal fiscal activities is only to understand implication on regional welfare, then it is acceptable to ignore allocation of national public goods. However, study focusing on fiscal flows must take in account all components of central fiscal policy. While provision of national public goods benefits residents across nation, benefits derived would depend on individual's utility function. Prevalent practice in the literature is to allocate these expenditures based on: a) per capita basis, or b) some concept of income (Ruggeri, 2009; Vaillancourt, 2010). First approach presumes that expenditure on public goods are based on vertical addition of uniform demand curves irrespective of income level, which means population can be taken as an indicator for interstate allocation. Other possible assumption is homothetic preferences with income elasticity of demand for public goods as unity, which means GSDP (Gross State Domestic Product) can be taken as an indicator for interstate allocation. The second approach is more suitable since it is also consistent with the idea that higher income groups have more assets to protect through national defence.

Another interesting factor in favour of linking national public goods with state income is its link with the revenue capacity of states; and consequent stability of the estimates of net fiscal flows under varying assumptions. Central tax revenues are estimated to be largely proportional to state income (Table 3), a trend observed in studies carried out in other countries also (e.g. Flavia et al, 2010 for Italy; and Espasa and Bosch, 2010 for Spain). Accordingly, allocating national public goods in proportion to state income also implies allocation roughly

in proportion to revenue contribution of the states. Hence, if one decides not to allocate national public goods to any state; both central revenues and expenditure at the state level would change by similar magnitude, maintaining stability of the estimates of net fiscal flows (presuming adjustments are made for fiscal surplus/deficits to obtain equality of total federal spending and revenues). Effectively, estimates of net fiscal flows would be similar under three assumptions for allocation of national public goods: i) not allocating these expenditure, ii) allocating in proportion to income, iii) allocating in proportion to revenue contribution.

3.1.3 Interest on federal public debt

There are two prevalent practices in the literature on treatment of interest payment. Under first approach, interest payments are included in the scope to maintain equality between total disbursement and revenues at aggregate level (Mansell and Schlenker, 1995; Ruggeri and Yu, 2003). Second approach suggests exclusion of this expenditure from calculations, and makes offsetting reductions on revenue side (McCracken, 1993; Flavio et al, 2010; Rompuy, 2010). First approach is clearly violation of the principle of allocating expenditure only if linked to provision of benefits. Second approach also poses conceptual problems by understating the burden borne by taxpaying regions.

Studies not allocating the interest payment recognized that though interest payment is current expenditure in accounting sense, the corresponding benefits had been delivered in the past through deficit financing. Hence, one possible approach is to allocate interest expenditure to regions which benefited from deficit financing in the past (Flavio et al, 2010; Rompuy, 2010). This approach requires regional allocation profile of central disbursement for a long time series, limiting the practical utility of this approach. Moreover, this or any approach allocating interest payment poses conceptual problem in the sense that one first allocates central disbursement to regions at their full cost in the year when it was financed by borrowing, and

then also adds the interest expenditure in future. Regional allocation of the goods and services provided through deficit financing should be attempted only in the year of borrowing, which is essentially net present value of all future repayments. Clearly, if one allocates all disbursement having implications for welfare (national public goods, local goods, and transfers); then allocation of interest payment would be a case of double counting. This issue is not well recognized in the literature (Mansell and Schlenker, 1995; Ruggeri and Yu, 2000; Vaillancourt and Bird, 2007, Flavio et al, 2010; Rompuy, 2010). Allocation of interest payment should be concerned not with the disbursement side, but revenue side, as it is essentially a deferment of revenue collection.

3.2 Central Revenues

Central tax collection, *ceteris paribus*, reduces the disposable income/purchasing power of the residents; for which burden may be distributed unequally across states.

3.2.1 Personal income tax

Accepted practice in the literature for allocating personal income tax is on the basis of residence, assuming that person who pays taxes also bears its burden (Ruggeri, 2009; Vaillancourt, 2010). Even in case of shifting of tax incidence, it is likely to remain within the same region (Ruggeri, 2009). The same approach is followed for this paper by using state-wise data on personal income tax collection from the CAG (Comptroller Auditor General of India) reports (CAG, 2016).

3.2.2 Corporate income tax

Estimating incidence of taxes on corporate profits requires certain assumptions and approximation. Empirical literature shows that capital is usually mobile within the nation, but

immobile at international level (Feldstein and Horioka, 1980; Thomas, 1993; Iwamoto and Wincoop, 2000). Since corporate tax rate is applied uniformly across the nation, entire burden must be borne by the owner of capital (recipients of interest and profits) in a closed economy. However, factors such as market power, non-tax barriers, and tax preferences at the regional level may enable corporations to pass on some burden to labour (Bosch, 2010; Ruggeri, 2010).

A compromise approach can be followed by allocating corporate taxes to both capital and labour, with equal weight to each. For this, separate indices were constructed to estimate state-wise shares in labour and capital, bearing burden of corporate taxes. For labour, only private organized sector was considered. Although many public sector enterprises (PSEs) pay corporate income tax, wages in PSEs are not linked with the profitability of organization. Rather, in practice, they are linked with wages of employees in government administration through recommendations of Central Pay Commission. For private organized sector, employment data was taken from Ministry of Labour and Employment. Further to capture, relative wage differential among states, data from Annual Survey of Industries (ASI) was used. Indian financial system is dominated by banking and insurance sectors that channel household savings into corporate debt and equity markets. Direct investment by households in corporate securities accounts for only 2 percent of the household financial savings. Hence, state-wise ownership of household financial assets in banking and insurance sectors can be used to allocate burden of corporate income tax on capital. Accordingly, an index of state-wise ownership of household financial assets covering banking and insurance sectors was constructed using data from RBI and Insurance Regulatory and Development Authority (IRDA). Correlation coefficient between allocation profile for labour and financial assets was around 0.85 for all years, indicating stability of the estimates under different weights. Sum of state level contributions in personal and corporate income tax was used to allocate remaining direct tax collection of central government.

3.2.3 Indirect taxes

Usual approach for allocating indirect taxes is on the basis of state-wise share in final consumption expenditure, termed as destination based approach. This approach is also used by statistical agencies in Canada and Australia for allocating federal indirect taxes among provinces to convert Gross Regional Products (GRP) at basic prices to market prices. China, in contrast, uses origin based approach for allocating indirect taxes among provinces for estimating regional product at market prices. Destination based approach, however, assumes that either the elasticity of demand for all goods and services in all states are zero or elasticity of supply of all goods and services are infinite. Reverse is true for origin based approach. Considering these as extreme assumptions, Sethia (2016) allocated central indirect taxes for India on the basis of both production and consumption, with equal weights for each. Same approach is adopted in present paper for allocating all central indirect taxes.

3.2.4 Non-tax revenues

Central government also receives non-tax revenues (NTR), mainly as: i) dividends from public sector enterprises, including seigniorage from monetary operations, ii) royalties on natural resources, iii) sales of goods and services, and iv) interest on central loans to state governments. Last item can be excluded from calculations because both burden and benefits are related to historical transaction that too within the same region. Third item, sales of goods and services by government are user charges and fees (e.g. tickets for public museums, monuments, school fee, pricing of water supply, etc.). Prices charged for government services are usually lower than the cost of production; with gap financed by fiscal resources that has already been allocated. There is no need to allocate user charges as the benefits and burden are incurred in same region, involving no interregional fiscal flows. Hence, only first two items, amounting 8% of total central revenue receipts qualify for regional allocation. Royalty includes

spectrum, license, and other fee associated with telecom sector. These were allocated based on state-wise collection of these charges, with data taken from answers to parliament questions. Dividend and other royalty receipts by government are similar to taxes on profits and production respectively. Accordingly, entire amount has been allocated in proration to state-wise contribution in total taxes.

3.3 Treatment of Fiscal Deficit/Surplus

Treatment of federal fiscal deficit/surplus is also an unsettled issue in estimating federal fiscal balances. Literature suggests two alternative approaches in case of fiscal deficit (surplus): i) increase (decrease) the revenue collected to match total disbursement, or ii) disbursement cut (increase) so as to be equal to revenues collected. Both these approaches have different implications on the size of fiscal balances at regional level. By increasing (decreasing) revenues to match total disbursement in case of fiscal deficit (surplus), first approach will give higher (lower) estimates of the fiscal balances than the later approach. Understandably, both approaches appear to be arbitrary, and can be chosen to provide estimates favouring particular political positions.

Vaillancourt and Bird (2007) provides an interesting theoretical basis to choose among two alternatives, which can very well be applied in Indian context. Over last 5 decades, central government has been running fiscal deficits (consistently) and primary deficits (mostly). This suggests that it is difficult to cut spending, and government prefer to create future revenue-repayment obligations by borrowings. If one assumes that regional disparities would remain reasonably stable over the next 15 years (weighted average maturity period of central borrowings was around 14 years during the last decade), regional contribution of taxes is also likely to remain stable. With this reasoning, it is possible to consider public borrowings as

deferred liabilities for taxpayers in proportion to their current contribution. Accordingly, the contribution of states was raised upward to match the total disbursement.

With decision to allocate public debt and not to allocate interest payment on public debt, this paper avoids pitfall of double counting which several papers have failed to appreciate. Accordingly, they unnecessarily calculate several sets of federal fiscal balances (such as basic balances, primary budget balances, balanced budget estimates with disbursement adjustments, balanced budget with revenue adjustments) with varying assumptions for adjusting (and not adjusting) the federal surpluses/deficit (Mansell and Schlenker, 1995; Ruggeri and Yu, 2000; Vaillancourt and Bird, 2007). This paper argues that calculating primary balances with adjustment on revenue side for fiscal surplus/deficits is the best approach for calculating federal fiscal balances, especially if the regional inequalities remain stable during the maturity profile of federal debt. Allocating both interest payment and fiscal deficit is a clear case of double counting.

4. Results and Analysis

This section serves three main purposes. Firstly, it discusses broad trends emerging from the new estimates on federal fiscal balances in India. Secondly, it examines impact of federal fiscal activities on regional income and fiscal inequalities. Lastly, it discusses limitations and policy implications of the new estimates.

4.1 Broad trends

Indian states are usually classified into major and minor states, depending solely on the size of population.¹³ 17 major states account for around 95 percent of the Indian population, with

¹³ Another classification, used for central fiscal transfers is general category and special category states. Special category states have hilly terrains and are located on international boundaries. Given the fiscal disabilities faced by these states, more generous central transfers are provided to them. Grouping of general and special category

the remainder living in 11 minor states and seven Union Territories (UTs). Table 3 presents a brief overview of the estimates prepared for major and minor states along with UT of Delhi, within the context of Indian regional accounts. A timeframe of 15 years is not too long to analyse intertemporal variations, yet some trends may be identified by dividing the period of into three quinquenniums. Estimates in Table 3 provides average value for relevant variables (by calculating percentages first and then averaging) in each of the quinquennium. This approach controls for both annual variability and inflation. State-wise total central disbursements, revenues, and fiscal flows are presented as a percentage of state income. To put things in perspective, share of states in national population along with their per capita income relative to national average (being 100) are also presented. This last variable can be termed as state income relative (SIR). The estimates suggest following broad trends of federal fiscal activities at regional level:

states is broadly comparable to the major and minor categories respectively, barring two exceptions: i) Assam is a special category state but part of major category states; and ii) Goa is a general category state but included in minor category states.

Table 3.1: Federal Fiscal Activities in Regional Accounts (Major States)

S. No	State/ Variable	Average 2000-01 to 2004-05					Average 2005-06 to 2009-10					Average 2009-10 to 2014-15				
		SIR	Popu lation	Disbur sement	Reve nue	Fiscal Flow	SIR	Popu lation	Disbur sement	Reve nue	Fiscal Flow	SIR	Popu lation	Disbur sement	Reven ue	Fiscal Flow
Major States																
1	Bihar	37	9	25	14	12	32	10	34	14	20	37	11	29	11	18
2	Uttar Pradesh	60	17	17	13	3	55	19	22	14	8	52	21	20	12	8
3	Jharkhand	71	3	16	14	2	68	3	20	17	3	63	3	19	15	4
4	Assam	77	3	21	13	8	66	3	28	17	11	61	3	28	14	14
5	Madhya Pradesh	73	6	16	12	4	65	7	21	13	8	68	7	21	11	9
6	Orissa	71	4	20	11	9	80	4	21	11	9	79	4	20	10	10
7	Chhattisgarh	77	2	17	12	5	86	2	20	11	9	85	3	18	9	9
8	Rajasthan	83	6	15	13	2	81	6	17	13	4	90	7	14	11	3
9	West Bengal	102	8	12	13	0	91	9	14	15	-1	90	9	14	14	0
10	Andhra Pradesh	110	8	13	12	1	115	8	14	13	1	121	9	13	12	1
11	Karnataka	114	5	12	15	-3	120	6	13	20	-7	117	6	12	19	-6
12	Tamil Nadu	128	6	11	14	-2	135	7	12	14	-2	141	7	10	12	-2
13	Kerala	137	3	10	14	-4	145	3	10	14	-4	140	3	10	13	-3
14	Gujarat	137	5	9	14	-4	151	6	10	14	-4	149	6	9	13	-4
15	Punjab	166	2	15	12	3	148	3	16	14	3	139	3	14	12	2
16	Maharashtra	153	10	9	16	-8	163	11	10	20	-11	160	11	9	21	-12
17	Haryana	165	2	12	11	1	171	2	11	12	-1	180	3	10	11	-2

Source: Author's calculations.

SIR: Per Capita State Income Relative to national average (with national per capita being 100).

Population = % Share of state in total national population

Disbursement = Total central transfers and expenditure as % of state income

Revenue = Central revenue collection from state as % of state income

Fiscal Flow = Net federal fiscal flows (+inflow/- outflow) as % of state income. It is calculated as the difference between disbursement and revenue.

States are arranged in ascending order of their per capita income (SIR average for all years)

Table 3.1: Federal Fiscal Activities in Regional Accounts (Minor States)

S. No	State/ Variable	Average 2000-01 to 2004-05					Average 2005-06 to 2009-10					Average 2009-10 to 2014-15				
		SIR	Popu lation	Disbur sement	Reve nue	Fiscal Flow	SIR	Popu lation	Disbur sement	Reve nue	Fiscal Flow	SIR	Popu lation	Disbur sement	Reven ue	Fiscal Flow
1	Manipur	82	0	44	11	33	72	0	57	11	46	61	0	61	9	52
2	Jammu & Kashmir	96	1	40	13	27	85	1	41	14	27	82	1	36	11	24
3	Tripura	103	0	34	11	23	92	0	41	11	29	85	0	45	11	35
4	Meghalaya	100	0	32	12	20	95	0	31	13	18	86	0	40	11	28
5	Arunachal Pradesh	99	0	63	10	53	104	0	64	11	54	115	0	58	9	49
6	Mizoram	114	0	66	12	54	101	0	68	13	54	105	0	62	10	52
7	Nagaland	109	0	45	13	32	111	0	45	13	32	108	0	49	10	39
8	Uttarakhand	103	1	23	14	10	127	1	19	13	6	144	1	16	11	5
9	Himachal Pradesh	150	1	22	12	11	142	1	23	14	10	145	1	21	12	8
10	Sikkim	116	0	66	13	52	138	0	52	14	38	230	0	39	9	31
11	Delhi	254	1	11	23	-11	269	2	10	23	-13	268	2	8	23	-15
12	Goa	308	0	9	14	-5	380	0	8	15	-7	410	0	8	14	-6

Source: Author's calculations.

SIR: Per Capita State Income Relative to national average (with national per capita being 100).

Population = % Share of state in total national population

Disbursement = Total central transfers and expenditure as % of state income

Revenue = Central revenue collection from state as % of state income

Fiscal Flow = Net federal fiscal flows (+inflow/- outflow) as % of state income. It is calculated as the difference between disbursement and revenue.

States are arranged in ascending order of their per capita income (SIR average for all years)

a) Central revenue collection as a share of state income is reasonably stable across states, except Maharashtra and Karnataka bearing higher burden of central taxes, especially in the second and third quinquennium. This can be explained by higher share of organized sector in the two state economies. Maharashtra is the most advanced state in terms of both service sector and industrial development, while Karnataka leads the country in information technology. Hence, both these states are expected to contribute more direct taxes, which are largely linked to organized sectors of economy. Poorer states of Jharkhand and Assam are also influenced by organized sector's contribution, though focused on natural resources. Among the richer state, it is only Punjab that receives net fiscal inflows, largely due to historical legacy associated with agricultural subsidies. Major source of redistribution is the disbursement side of central fiscal policy, where there is high variation in its share of state income. This trend has been observed in other federal economies also, where disbursement side was found to be main channel of fiscal redistribution (e.g. Flavia et al, 2010 for Italy; and Espasa and Bosch, 2010 for Spain).

Table 4: Summary Data of 'Donor' and 'Recipient' Group of the States

Indicator	2000-05	2005-10	2010-15
Population (%)			
Recipient	60.1	60.5	60.8
Donor	39.9	39.5	39.2
Income Share (%)			
Recipient	45.7	44.0	44.5
Donor	54.3	56.0	55.5
Flow: In (+)/ Out (-) as % of Group Income			
Recipient	5.33	7.64	7.78
Donor	-4.30	-5.89	-6.14

Source: Author's calculations.

Note: Data are average for each quinquennium

b) Table 4 gives summary data for the states divided into categories, namely 'donors' having net fiscal outflows, and 'recipients' having net inflow of fiscal resources through central

fiscal policy. At aggregate level, 7 major and 2 minor states (including UT of Delhi) accounting for roughly 40 percent of the Indian population, were net ‘donor’ states; while remaining 60 percent lived in the ‘recipient’ states. This is interesting and in quite contrast to numbers observed in developed federal economies. For example, in case of Canada, 60 percent of its population lived in the donor states with remaining 40 percent in the recipient states (Ruggeri, 2010). Clearly, reduction in regional inequalities, through fiscal redistribution, would be more challenging in India than in Canada. This is more so due to higher regional disparities in India than developed federal economies; a point earlier made in Table 1. This issue will be revisited in section 4.2. It would be interesting to examine this distribution in other developing federal economies, with varying degree of regional inequalities. Unfortunately, the data and research gaps prevalent in the Indian context are also present there.

- c) Size of interregional fiscal flows as a share of state income has gone up particularly in second quinquennium, a trend maintained in third quinquennium also. More precisely, net contribution by 9 donor states have gone up from 4.3 percent to 6.14 percent of their aggregate state income between first and third quinquenniums. Correspondingly, net fiscal inflows in the remaining 20 states have also gone up from 5.33 percent to 7.78 percent of their aggregate state income in the same period. The numbers are comparable with Spain at around 5 percent for both recipient and donor regions (Espasa and Bosch, 2010). In case of Italy, donor group contributes roughly 6 percent of provincial income while recipients gain 12 percent of their provincial income (Flavia et al, 2010). Indian economy has grown at rapid pace during this period, providing greater tax revenues to central government for redistribution. Existence of regional disparities with increasing tax revenues for the central government create both need and provide opportunity to increase the quantum of regional redistribution. It is interesting to note that income share of recipient group has fallen in

second quinquennium with partial recovery in third quinquennium. This indicates some convergence in income with better growth performance of this group during the third quinquennium compared to donor group.

- d) Lastly, generous transfers to special category states are reflected in estimates of net fiscal inflows to these states, with several instances of net fiscal flows being more than 50 percent of state income.

4.2 Equalization

4.2.1 Income equalization

Discussion so far clearly shows that substantial fiscal redistribution is carried out in terms of the size of national and regional GDP. Following Bayoumi and Masson (1995), there have been several studies examining impact of federal fiscal redistribution on reduction in regional disparities (Duboz and Nicot, 1998; Melitz and Zumer, 1998; Domenech et al, 2000). The basic approach followed in these studies is to estimate relationship between per capita income before and after federal fiscal activities. This can be estimated using simple regression through Ordinary Least Squares (OLS), shown in Equation 1:

$$\frac{(Y - TAX + DISB)_i}{Y - TAX + DISB} = \alpha + \beta \frac{Y_i}{Y} + \epsilon_i \quad (1)$$

Where:

Y is per capita state income before central taxes and disbursement;

TAX and DISB are per capita central taxes and disbursement respectively.

Subscript i refers to individual states while unsubscripted variables refer to national average.

It should be noted that both dependent and independent variables, in equation 1, are in state relative form (with national average being 100 for each year). Hence, observations need not be converted at constant prices, and they also do not suffer from the intertemporal scale effect due to economic growth. Hence, it is suitable to use pooled OLS regression for such

estimation. The difference between β coefficient and unity represents size of the offset to initial income disparities caused by fiscal flows. For example, a coefficient of 0.8 indicates that 80 percent of the initial differences in relative incomes remain even after the federal fiscal redistribution, with 20 percent offset in the initial regional income inequalities. Regression was carried out separately for three quinquenniums to see the intertemporal trends in reduction in pre and post transfer income inequalities. Hence, total number of observation for each regression was 145 (29 states for 5 years). Given substantial interstate variation in population of the states, regressions were weighted by population.

Table 5: Regression Results for Reduction in Income Inequalities

Variable	2000-05	2005-10	2010-15
Y	0.90 (72)	0.86 (72)	0.85 (66)
R ²	0.97	0.97	0.97
N	145	145	145

Y= is the initial income
Values in parenthesis denotes t value

Table 5 provides regression results. The β coefficient was estimated at 0.90 in the first quinquennium, indicating that federal fiscal redistribution could offset only 10 percent of initial income disparities. This increased during subsequent quinquenniums in the range of 14-15 percent. In comparison, offset in initial income inequalities were estimated at 22 percent and 40 percent for the USA and Canada respectively (Bayoumi and Masson, 1995). In European Context, it was estimated at 40% for Germany (Duboz and Nicot, 1998); 32% for Spain (Barberan et al, 2000), 38% for France, and 26% for the UK (Melitz and Zummer, 1998).

Above discussion suggests that, despite contribution by donor states at levels comparable with European countries, federal fiscal redistribution in India fails to make any significant dent on regional income disparities. Failure to reduce income inequalities through federal fiscal redistribution can be explained by two factors. Firstly, as roughly two-third of the

Indian population lives in recipient states, there are few donor and many recipients. Secondly, there are wide disparities in income levels, with average per capita income of the donor states being twice of the average for recipient states. This entire discussion suggests that federal redistribution cannot be used in India for reducing regional income inequalities. The only way to address regional imbalances is by improving productivity and growth performance in the poorer regions.

4.2.2 Fiscal capacity equalization

The most important purpose of federal fiscal redistribution is to achieve horizontal fiscal equalization. By replacing income with relevant fiscal indicators, equation 1 can be modified to estimate the extent of reduction in horizontal fiscal inequalities achieved through fiscal redistribution. This is shown in equation 2:

$$\frac{Fiscal\ Position_i}{Fiscal\ Position} = \alpha + \beta \frac{Fiscal\ Capacity_i}{Fiscal\ Capacity} + \epsilon_i \quad (2)$$

Where:

Fiscal capacity = Sum of revenue collection by central and state government from the state¹⁴.
 Fiscal Position = Fiscal capacity plus net federal fiscal flows (inflow +/outflow -)

In the base scenario with no federal fiscal redistribution, fiscal capacity can be assumed as an indicator of resource availability for regional governments. However, total government expenditure departs from the base scenario due to federal fiscal redistribution. Poorer states, receiving net fiscal inflows, are able to have higher consolidated government expenditure

¹⁴ Own tax revenues are based on average tax effort. Bird (1993) argued that while analysing issue of horizontal fiscal capacity equalization, representative or average tax efforts by all local governments should be used for measuring their own tax revenues. This potential revenue capacity, instead of actual revenue collection, avoid inclusion of shortfall due to lower tax effort by local governments in the horizontal fiscal inequality. This approach is also consistent with prescription by Buchanan (1950) of ability to provide comparable services at comparable tax effort.

(combined expenditure of central and state government) than the limits set by their fiscal capacity. Reverse is true for the richer states. The β Coefficient continues to have similar interpretation that is the percentage of initial regional fiscal inequalities that remained even after federal redistribution. Regression was carried out on similar lines, with three regressions for three quinquenniums. Results are reported in Table 6. The β coefficient was estimated at 0.51 in the first quinquennium, indicating that federal fiscal redistribution could offset 49 percent of initial fiscal disparities. However, reduction in fiscal disparities improved to 65 percent in the third quinquennium. Clearly, central fiscal policy is playing an important role in reducing the interstate fiscal disparities.

Table 6: Regression Results for Reduction in Income inequalities

Variable	2000-05	2005-10	2010-15
F	0.51	0.39	0.35
	(11)	(11)	(10)
R ²	0.47	0.48	0.42
N	145	145	145

F= is the initial fiscal capacity
 Values in parenthesis denotes t value

A brief comment is required on the concept of fiscal equalization. It should be noted that data on government expenditure are at current prices of individual states rather than at all India prices. It is widely accepted that nominal price levels are usually lower in the poorer regions. Hence, the fiscal equalization achieved at all India prices should be higher than the nominal equalization of 65 percent estimated above. The actual extent cannot be measured without having data on purchasing power of the Indian rupee (currency) across states. Another argument can be made regarding the real cost of providing government services. Theoretically, real cost of providing per unit of government services should be lower in the poorer states if one allows for the famous Baumol's cost disease (Baumol, and Bowen, 1966). Wages constitute roughly 65 percent of the Government Final Consumption Expenditure (GFCE) in

India, which should be linked to productivity and wages in the non-government economy. Given the lower productivity and wages in non-government sectors of the poorer regions, real wages in government sector should also be lower than those observed in high productivity regions. However, this theoretical argument for having lower nominal and real wages for government sector in poorer regions largely does not hold in practice due to political reasons.

4.3 Interpretation, Limitations, and Policy Uses

Estimation of fiscal flow at regional level involves substantial effort to obtain official data, develop suitable indicators, and maintain conceptual consistency. Hence, once the hard work of estimating such flows has been accomplished, it is tempting to indulge in policy recommendations on their being too low or high. While deriving conclusion using estimates of federal fiscal flows on the benefits/burden to the constituent units in the federation, it is pertinent to give some space on their scope, limitations, and policy implications. This paper followed most reasonable assumptions for interstate allocation of various components of federal fiscal activities with some methodological clarifications. All in all, the numbers presented above are fairly good to remain stable under different alternative reasonable assumptions for allocation of federal fiscal activities. This is mainly because of the use of disaggregated data on expenditure side, and high correlation between alternative estimates on revenue side.

Notwithstanding stability of the estimates provided, one should not, however, literally equate the localization of expenditure with the benefits to the region. There can be substantial interregional spill-over of the benefits from government expenditures, especially in an open federal economy. For example, construction of roads in the poorer states also benefits richer regions by providing them access to markets. Similarly, provision of health and education in the poorer regions benefit the richer regions through human capital flows from poorer to richer

regions. This effect of human capital can be very crucial in developing industrial and service base in the richer regions, which provide taxes to government. One can clearly see evidence of such spill-overs in form globally competitive information technology sector in Indian cities such as Bangalore, Hyderabad, and Gurgaon; housing highly educated workforce coming from entire nation. Such spill-overs are diffuse, complex, and require substantial research for measurement both at conceptual and empirical level. Recalling the debates on 'brain drain' at international level, despite many barriers on international migration, the flows can be even more substantial in an open federal system.

Finally, the estimates presented in this paper do not capture non-fiscal activities of the central government, which can also influence interregional flows of resources. For example, most of the poorer states in India have abundant mineral resources, but mainly used in the richer states at prices lower than international markets. Control by the central government on natural resources and their pricing allows it to engage in interregional resource flows favouring high income states. Richer states also benefits from the access to large internal market, partly supported by the fiscal flows. On other hand, net fiscal outflows in presence of increasing globalization can have implications on competitiveness of richer states, and consequent tax revenues of states and central government. This is one reason why richer regions in Spain, Italy, and Belgium, having access to larger European market, do not wish to bear 'burden' of supporting poorer regions of their country (Rodden, 2009). Clearly, balancing equity and efficiency in federal redistribution becomes more challenging with globalization.

5 Conclusion

The primary focus of this paper was to prepare estimates of interregional fiscal flows in India. Though this exercise involved several assumptions, the final estimates show stark interstate variations which should hold under alternative assumptions. This is mainly because of use of disaggregated data on expenditure side, and high correlation between alternative estimates on revenue side. This paper also makes methodological contributions on regional allocation of federal fiscal deficit and interest payment on public debt by providing theoretical ground for their allocation, while avoiding double counting. Hence, only single set of estimates are prepared. This issue was not well addressed in the existing literature, leading to multiple sets of estimates, some of which involves double counting (Mansell and Schlenker, 1995; Ruggeri and Yu, 2000; Vaillancourt and Bird, 2007).

The paper proves obvious fact on direction of interregional fiscal flow in India, but importantly provides estimates for magnitude of the flows. Size of interregional fiscal flows, at around 5 percent of the state income for donor regions is comparable to numbers observed in European countries. Despite this, it does not translate into comparable reductions in regional income inequalities. Roughly 40 percent of the Indian population lives in the donor states, providing fiscal resources to rest of the country. Also, Indian federal system is marked by substantial regional disparities, with average per capita income of the donor states being twice of the average for recipient states. With small donor base and wide regional disparities, it is impossible to use fiscal redistribution as a tool for reducing regional income inequalities. The only way to address regional imbalances is by improving productivity and growth performance in the poorer regions. However, fiscal flows are successful in making substantial dent in the interstate fiscal disparities, addressing two third of the gap.

Estimates of interregional fiscal flows are useful in analysing their impact on regional fiscal disparities, income inequalities, macroeconomic stabilization, and provision of

government services. Researchers interested in working of political economy, federalism, and regional economics will find them useful. Further research is required on interstate price variations and unit cost of providing government services at state level. Addressing these data gaps would allow better understanding and policymaking on both fiscal federalism and regional development.

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