



**International Journal of Humanities & Social Science Studies (IJHSSS)**

*A Peer-Reviewed Bi-monthly Bi-lingual Research Journal*

ISSN: 2349-6959 (Online), ISSN: 2349-6711 (Print)

ISJN: A4372-3142 (Online) ISJN: A4372-3143 (Print)

Volume-IV, Issue-V, March 2018, Page No. 71-79

Published by Scholar Publications, Karimganj, Assam, India, 788711

Website: <http://www.ijhsss.com>

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## **Central Transfer and Revenue Generation Effort of Northeast States: An Empirical Analysis**

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### **Abstract**

**Objectives:** *The present study is a modest attempt to examine if the northeastern states use some of the central funding to offset current taxes through reallocations instead of using the same for increasing public expenditure.*

**Methods/Statistical analysis:** *In order to examine the impact of central transfers (CT) on revenue response of state governments, a simultaneous model has been estimated. Data of the present study have been collected from Handbook of Statistics on State Government Finances and Handbook of Statistics on Indian Economy published by the Reserve Bank of India. Data related to the nominal variables have been normalised by SDP deflator for controlling inflation rate.*

**Findings:** *The findings suggest that tax collection of northeastern states responds inversely to the changes in central transfers. However, when we disaggregate total transfers into conditional and unconditional transfers, we find that tax collection increases with an increase in conditional transfers.*

**Application/Improvements:** *Our findings raise serious concerns regarding the existing pattern of intergovernmental transfers in India.*

**Keywords:** *Intergovernmental transfers; fungibility of transfers; tax effort, 2SLS technique; Northeast India.*

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**1. Introduction:** Central transfers are an important feature of any federation. These transfers are actually provided for reducing fiscal imbalances and to promote economic development. While the immediate objectives of intergovernmental transfers are to combat fiscal imbalances, meet national re-distributional goals, promote local expenditures on specific goods and services [1,2,3], but the ultimate goal of such transfers is to promote economic growth. However, such transfers allow the sub national governments with the autonomy to make fiscal adjustments in carrying out their own responsibilities. Hence, these transfers depending on its nature may result in two different kinds of expansionary fiscal policy: tax cut and government spending. Again, there are empirical evidences of “asymmetry hypothesis” that state governments respond to declines in transfers differently

from increases [4,5]. Yet, after decades of intergovernmental transfers in India, studies meant to analyse specifically the utilization aspect of such transfers are very few in number. And even these limited studies have considered the non-special category states only considering Assam in few cases; [6,7,8,9], while the bigger share of the transfers belong to the special category states. Again most of the studies have investigated the responses to transfers in the form of expenditure pattern, whereas the revenue responses remained almost unattended few attempts [8,10]. On this background, the present study seeks to examine if recipients instead of spending for developmental purposes use some of the central funding to offset current taxes or to fund other programmes through reallocations of fungible resources in the period of the grants. Answer to this question is not only important to understand the fiscal behaviour of state governments; it has also implications for economic growth. Because if central transfers are used by the local authority as a way of gaining popularity through reduction in taxes rather than increasing spending, this will have a lower impact on income generation process. And in that case, government will have to trade off higher income (i.e., growth) for popularity. After the introductory section, an overview of India's Intergovernmental Fiscal Transfer System has been given. Next section deals with the survey of previous theoretical and empirical works on the impact of transfers on tax collection. The fourth part of the paper includes the data source and methods followed. The findings of the research are reported in the fifth section and finally the paper is concluded.

## 2. Methodology:

**Data Source:** Data have been collected from Handbook of Statistics on State Government Finances and Handbook of Statistics on Indian Economy published by the Reserve Bank of India. Data related to the nominal variables have been normalised by SDP deflator for controlling inflation rate.

### **Empirical Methods:** Performance of States in Terms of Tax Collection

In an attempt to analyse the performance of different states in terms of tax collection, we have used an index called divergence index which shows the performance of a state compared to the overall average over the study period. We compute this average divergence in two different ways. Firstly, we calculate an index called  $D_1$  using the following formula.

$$D_1 = \frac{\sum(T_{it} - \bar{T}_t)}{P}$$

Where,  $T_{it}$  represents per capita own tax revenue of the  $i^{\text{th}}$  state,  $\bar{T}_t$  refers to the average per capita tax revenue for the entire region concerned, and  $P$  is the number of years considered in the study. Since there is considerable variation in state-wise population, which in turn influences the magnitude of tax collection, therefore we thought magnitude of tax in per capita form will give a better picture. The magnitude of this index shows how far a state has diverged from the national average. A positive value of  $D_1$  would indicate that the performance of the concerned state is better than the regional average over the period, whereas, a negative  $D_1$  implies a tendency of divergence below the average standard. If the value turns out to be null, then we conclude that the state is performing almost in the same pace of national average over the time range.

This measure however does not reveal whether a state is predominantly performing better or worse. To find this, we construct a second measure of divergence index called  $D_2$  which is expressed as

$$D_2 = \frac{\sum \left( \frac{T_{it}}{\bar{T}_t} \right)}{p}$$

If  $D_2$  comes out to be greater than unity, the state in question performs on the average better.

### Central Transfers and Tax Effort

As this study attempts to test the asymmetry hypothesis for northeastern states, we hypothesize that sub national governments respond to the increasing transfers differently from the decreasing ones. Thus, the asymmetric variable is defined as

$$A_{it} = T_{it} - T_{it-1}, \text{ If } T_{it} < T_{it-1} \\ = 0, \text{ otherwise}$$

Where,  $T_{it}$  stands for central transfers for state  $i$  in period  $t$ . The value of variable  $A_{it}$  is negative for the years of cut in transfers and  $0$  otherwise. The coefficients of these variables would measure the tax responses to a reduction in transfers relative to an increase in the same. A statistically significant asymmetry variable would reject the null hypothesis of symmetrical tax response to an increase and a decrease in transfer. If the declining transfers are responded by generating more tax revenues to compensate for the loss in transfers by the states, then it would substantiate the presence of “fiscal replacement” form of asymmetry. On the contrary, the “fiscal restraint” form of asymmetry will be vindicated if the response to cuts in transfers is declining tax collections. All tax and transfer variables are expressed in real per capita terms.

In order to see the impact of central transfers ( $CT$ ) on tax effort ( $TE$ ), a simultaneous model has been estimated.

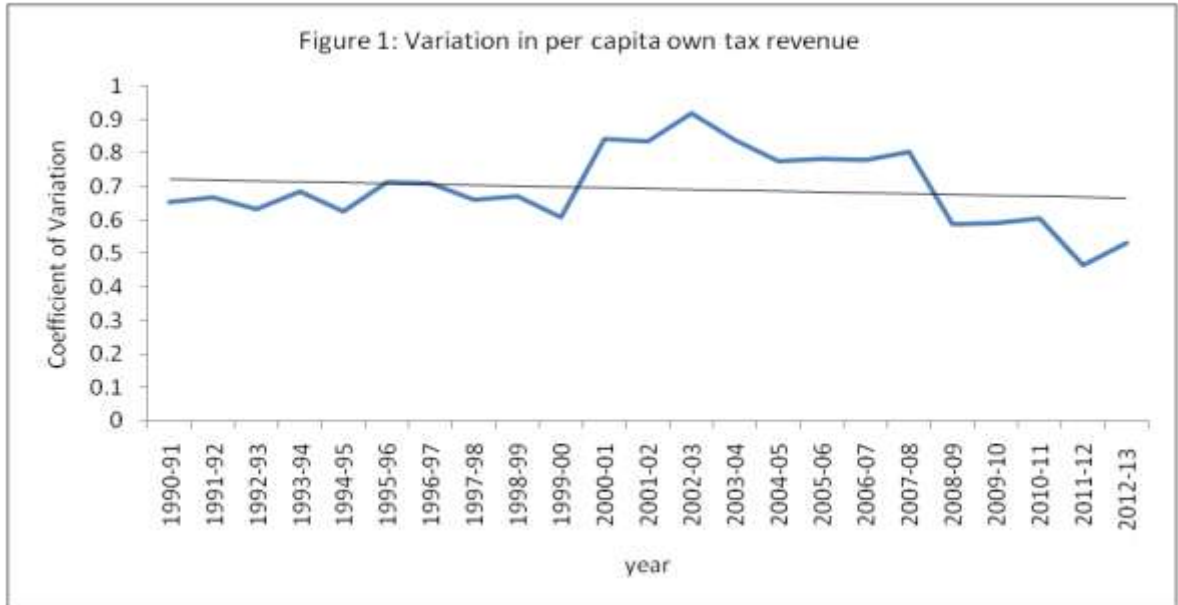
$$(TE)_{it} = \pi + \rho (PCT)_{it} + \partial A_{it} + \sigma' C' + e_{it}$$

Here, tax effort has been represented by state's own per capita tax revenue. In addition to central transfers and asymmetry variable, we considered some control variables affecting tax revenue collection. These are fiscal space, tax structure complexity, internal debt, per capita income, dependency ratio, share of primary sector to total GDP. If  $\rho < 0$ , then it would imply that central transfers in fact, discourage tax effort in the states of India. If  $\partial > 0$ , then there will be the evidence of fiscal replacement form of asymmetry and if  $\partial < 0$ , then it is the evidence of fiscal restraint.

### 3. Analysis of Results:

#### *Variations in Revenue Generation Effort*

Since one of the important justifications behind the intergovernmental transfers is to balance the horizontal imbalances across states, first of all we attempt to see the trend in the variations in tax revenue generation. To do this, we have drawn a figure to see the trend in inequalities across states in per head tax collection.



Source: Drawn by authors.

Figure 1 shows a no significant trend in the horizontal inequalities across the northeastern states over the era of 23 years.

However, in order to examine the statistical significance of the trend analysis, the following simple regression equation has been estimated:

$$y_i = \alpha + \beta t + u_i$$

Where,  $y$  stands for the coefficient of variation of per capita own tax revenue for  $i^{\text{th}}$  state,  $t$  stands for time trend,  $\alpha$  and  $\beta$  are the coefficients of the model. A significant positive value of coefficient of time,  $\beta$  indicates an increasing trend while a significant negative value of the coefficient would mean negative trend in the trend of inequality. Table 1 reports the estimated results.

**Table 1. Trend in Horizontal Inequality**

Dependent variable: CV of states' per capita tax collection		
Variable	Coefficient	t-value
Constant	0.84***	5.22
Time	-0.01	-1.04
$R^2 = 0.47$		$F = 1.08$

Note: (i) \*, \*\*, \*\*\* refer to significant at 1, 5 and 10 percent respectively. (ii)

Autocorrelation has been corrected by Cochrane-Orcutt method.

Source: Estimated by authors.

The regression results also confirm that there is no significant variation in tax collection within states during the study period.

#### *Performance of States in terms of Tax Collection*

Next we move to explore the relative performance of states in terms of per capita tax revenue generation. In an attempt to do that, we have computed two indices, viz, Divergence Index and Predominance Index using formula as mentioned in methodology section.

**Table 2. Performance of states in terms of own tax effort during 1990-2013**

States	Divergence index ( $D_1$ )	Predominance index ( $D_2$ )
Arunachal Pradesh	-186.23	0.549238
Assam	92.31199	1.285527
Manipur	-411.264	0.447348
Meghalaya	108.8762	1.308055
Mizoram	-328.772	0.570069
Nagaland	-358.941	0.606806
Sikkim	1120.02	2.404065

Source: Calculated by authors.

We can see in Table 2 (column 2) that the tax revenue collection is lower than the group average for the states excepting Sikkim, Meghalaya and Assam. In short, measured in terms of  $D_1$ , Sikkim is identified as the best performing state followed by Meghalaya and Assam while Manipur being the poorest one. However, merely seeing the deviation from the average ( $D_1$  index), we may not get the actual performance of the states as the index is affected by the extreme values. Hence, we compute  $D_2$  to understand if a given state performs predominantly better than group average<sup>3</sup>. Measured in terms of  $D_2$ , we observed that Sikkim still manages to be the best performer and Manipur also occupies the last position.

#### *Central Transfers and Tax Effort: Estimated Relationship*

Before estimating the regression, endogeneity test for the possible variables has been conducted and the results revealed that central transfers, fiscal space and internal debt are endogenous. Thus, we opted for a Simultaneous Equation Model using Instrumental Variables Technique. Table 3 displays the estimated results of the impact of transfers on tax collection of the states.

**Table 3. Simultaneous Model Results**

Variables	Model1	Model 2#
$\ln PCT_{it}$	-0.49 (-4.30)***	
$\ln PCCT$		1.32 (5.82)***
$\ln PCUT_{it}$		0.60 (0.36)
$A_{it}$	0.01 (1.14)	
$CA_{it}$		-0.01 (-3.64)***
$UA_{it}$		0.01 (0.61)
$\ln FP_{it}$		-0.08 (-0.43)
$\ln ID_{it}$	0.51 (4.66)***	
$\ln PCI_{it}$	0.54**	0.01 (0.01)
$\ln DR$		-0.87 (-2.25)**
$SPS_{it}$	-0.04 (-9.13)***	-0.03 (-8.62)***
$HHI_{it}$	-0.01 (-1.69)*	0.01 (2.82)***
Constant	7.17 (2.41)**	-2.29 (-1.36)
Adjusted R-squared	0.74	0.96
F Statistic	126.84***	210.88***
D-W Statistic	1.16	1.29
Prob(J-Statistic)	0.47	0.41
Test of Endogeneity $H_0 =$ variables are exogenous		
F Statistic	16.91***	145.01***

Note: (i) Figures in parenthesis refer to t statistics. (ii) \*\*\*, \*\*, \* denotes statistical significance at 1%, 5% and 10% level respectively. (iii) # indicate it is a fixed effect model.

Source: Authors' research.

Results show that own tax collection responds inversely to the changes in central transfers (model 1). When transfers are increased tax effort of state governments gets slackened. Thus, we find a clear evidence of fungibility property of such transfers which allows the local authorities to substitute some of the funding for tax revenues. Secondly, asymmetry variable is found to be insignificant. Thus, declining transfers do not influence tax collection effort.

When we disaggregate total transfers into conditional and unconditional transfers, we find that own tax collection increases with an increase in conditional transfers while unconditional transfers becomes insignificant in influencing tax collection (model 2). Unlike the earlier case, here we found fiscal restraint form of asymmetry for conditional transfers implying that when conditional transfers fall states actually reduce their effort of collecting taxes. A possible reason behind such behaviour may be that when the share of conditional transfers declines, states continue to get higher share of transfers in lump sum amount and thus can use part of those funds as a substitute for tax revenue.

Moving to the control variables, we see that increases in internal debt seems to affect positively tax collection in model. While and fiscal space affects negatively the tax effort. Third, the negative and significant coefficient of HHI indicates that a more complex and diversified tax revenue structure<sup>1</sup> increases tax collection. This is because tax collection from multiple sources makes it less vulnerable to negative shocks affective when collected from one single source. Fourth, tax revenue in the northeast, as expected, is positively associated with per capita income of the state and negatively with the share of primary sector. Finally, dependency ratio affects negatively the tax revenue collection.

**4. Conclusion:** Transfers from the central government represent a significant part of state finances. The tax collection effort of northeastern states reacts inversely to the variations in central transfers at the aggregate level. Thus, financial assistance fails to create incentives for the mobilization of public revenue; on the contrary, assistance is linked with reduced revenue generation of the state governments. The implication is that central dependence of state governments fosters more central dependence, rather than acting as an additional source of developmental finance and to meet deficit in governmental expenditure. However, when we analysed the relationship separately for conditional and unconditional grants, we got a different picture. We find that conditional transfers are positively associated with tax generation effort of state governments while unconditional transfers do not have any impact.

The unconditional component of grants is damaging the self-sustained source of development finance and creating a culture of aid dependency among the Indian states. State governments use unconditional component of transfer as a way of gaining popularity by converting them into resources to reduce tax revenue rather than increasing spending. This attempt of transfer fungibility undermines the growth effect of transfers. Given the fact that unconditional assistance accounts 50 percent share in total grants on average, our

findings raise serious concerns regarding the pattern of intergovernmental transfers in India. Unless the conditional component of grants is increased significantly, central transfer shall do more harm than good in creating a sustained base for developmental finance of state governments.

### Endnotes:

1. The formulae used for calculating fiscal space and tax structure complexity are reported in appendix section.
2. It may be noted here that  $D_2$  turns out to be greater than unity only when the state in question performed better than the average for most of the years.
3. It may be noted here that  $D_2$  turns out to be greater than unity only when the state in question performed better than the average for most of the years.
4. Find that derivative of tax with respect to asymmetry is found by the coefficient of asymmetry variable for non-special states and for special category states, it is the coefficient of asymmetry plus that of asymmetry of special states.
5. Tax structure complexity has been measured by Hirschman-Herfindahl Index (HHI). The details are reported in the appendix section.

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