STRUCTURAL SIFTING IN TAX REVENUE OF INDIAN STATES: A DUMMY VARIABLE ANALYSIS

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ABSTRACT

Using the annual data from 1980-2012, this paper attempts to test the structural shifting in tax revenue of state government in India within the empirical framework of dummy variable regression analysis. During the period 1980 – 2012, this study finds there is upward sift in tax revenue in most of states. Bihar is only state which shows downward trend in tax revenue at the same period. Eight states show no shift in their tax revenue structure during the entire period. Over all tax revenue's shifting move upward during the period 1980-2012.

Key words: *Tax revenue, Structural Shift, Dummy Variable Analysis*.

Introduction

In the Indian economy, the tax system has been use as an important source of financial development. So the centre as well as states has been focused on tax revenue. It is a fact that, the Centre, several States are also facing deteriorating trend of tax revenue, with serious implications on their developmental efforts. Insufficient revenue sources, uncontrolled growth of current expenditures, and failure of central transfers to grow as fast as the States' own revenues have been the sources of the imbalances. In many respects, the situation of tax revenue in the States is more critical than that at the Centre as the States have the primary Constitutional responsibility for providing basic social and economic services.

The constitution assigns a number of important tax resources to central government and a limited amount of tax resources to the states. Most of the buoyant sources of revenue are in the purview of central government. But the fiscal responsibilities in meeting huge expenditure remained with state government (Jena, 2001). These factors have created acute problem for the fiscal adjustment in the states. RBI (1999) study emphasized the structural nature of imbalance in state finance, stemming from the limited resource base in relation to growing expenditure commitments. Eleventh Finance Commission (2000) focused on a series of immediate and longer term issues of fiscal ailment. The phenomenon of expenditure growth outpacing the growth of revenue, noticed in the eighties, got widened in the mid nineties with stagnating revenue growth and fast expansion of expenditure.

The aggregate pictures of all the states have shown the vast inter- state differences in tax performance. Ahluwalia (2000) explained that the growth rate of SDP of all 14 states have shown faster in 1990-98 than 1980-90 but increased variation between growth performance of the states in 1990s. It reflected the fact that richer states accelerated their growth. Kurian(1999) in his paper attempts to bring out the deteriorating trend in state finance in recent years. Failure to contain wasteful expenditure and reluctance to raise additional resources on the part of the states are the main problems most of the state's finances. Rao (2005) talked about reasons for slow growth of tax revenue. The growth of each of the major states has shown deceleration in the growth in the 1990s. Chelliah (2002) discussed his paper about the rational way of increasing the tax

revenue of central and state government in India. Bhargava (2002) discussed about the state level fiscal reforms. The state should play complementary and supplementary role, it is high time that agriculture income tax should be included in constitution to raise the revenue of the states.

In this paper, we have tried to focus performance and structural shifting in Indian state's tax revenue since 1980-81 to 2011-12. And also focus on the important issues that any significant impact of revenue which comes from taxation after adopting the liberalization policies. The present paper has been divided into five section including introduction. The second section is a brief discourse on objective and hypothesis. The third section deals with slow growth rate of tax revenue scenario in Indian states during 1980-2011. Modeling on tax revenue describe in fourth section. Last section shows summary and conclusion.

Trends and change in the composition in state taxes

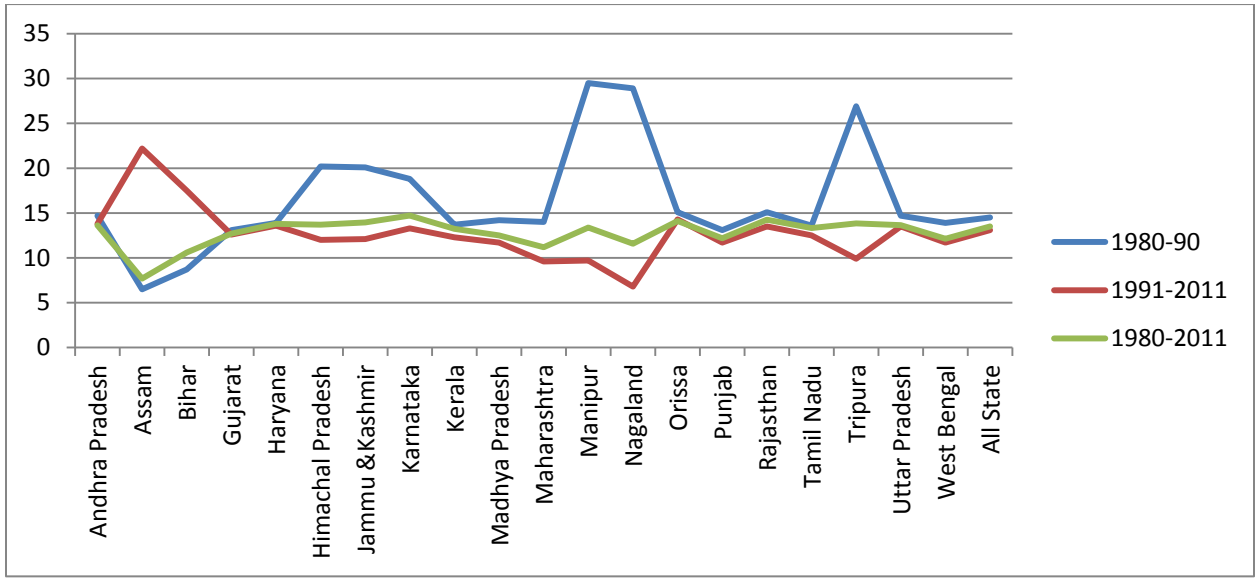
Revenue of state can be broadly combination of tax and nontax revenue. Tax revenue are classified into own tax revenue and share in central taxes. The power of taxation is specified in the state list in the seventh schedule. Under these provisions, the states can collect revenue on land and buildings, agriculture land and income, mineral rights, alcohol and narcotics substance but not tobacco, entry of goods into a local area for consumption or sale, electricity consumption, stamp and registration fee on document. But the major tax sources for India' states are sale tax, stamp duties and registration fees, state excises on alcohol and motor vehicles, goods and passenger taxes.

The tax structure of the States has undergone perceptible changes over time, in terms of both the absolute and relative contributions of taxes. Revenue from taxes has increased in absolute term from Rs. 1040509 lakhs in 1981-82 to Rs. 4458609 Lakhs in 1991-92, Rs. 16431404 Lakhs in 2001-02 and Rs.81298724 Lakhs in 2012. The share of own taxes as a percent of total tax revenue has sharply increased from 63.1 percent in 1981-82 to 70.1 percent in 2011-12. It has shown marginal improvement in own tax revenue during the whole period. The relative share of land revenue has declined with 1.3 percent in 1981-82 to 0.87 percent in 2011-12 as a percent of tax revenue. In absolute term, stamp and registration fee has increased from Rs 42514 lakhs in 1981-82 to Rs. 6437948 lakhs in 2011-12.

Among the State indirect taxes, a certain structural transformation of the relative role of different constituents is evident from the statistical data. Sales taxes of course remain the most significant source of indirect tax revenue for the States. Over the period under study, the relative importance of these taxes in terms of percentage contribution to tax revenue has changed. Their contribution improved from 37.3 per cent of total tax revenue of all States in 1981-82 to 42.5 per cent in 2001-02, but then declined significantly to 34.2 percent in 2011-12. The contribution of State excises to State tax revenues is also quite significant, at about one sixth of their total indirect tax revenue. Over time, however, there has been some improvement in its relative contribution from 7.9 per cent to 8.3 per cent (during 1981-82 to 2011-12). A similar improvement in the relative share is also discernible in the case of tax on property. Its relative contribution has increased from 5.5 percent to 8.9 percent during 1981-82 to 2011-12.

The changes in the relative shares of the different indirect taxes have been the result of their differing rates of automatic growth and of the directions of additional resources mobilizations by the States. These factors can be analyzed through the measurement of the elasticity of the major indirect taxes.

Figure 1.1 Average Annual growth rate of tax revenue during three periods (1980-90, 1990-2011, 1980-11)



Source : "state Finance" RBI (Various Issues)

Figure 1 shows that the trend of tax revenue is deceleration during the period 1980-2011. In pre reform period, the average annual growth rate of tax revenue shows acceleration in entire period but this trend turns deceleration during the period 1991-2011. Another problem is to simplify the tax system and reduce corruption levels. Thus we can say that there were so many reasons behind the slow growth of tax revenue to keep it in decelerated trend during 1980-2011

Objective

In the paper, we focused on this objective as follows:

- To examine the structural shifting of tax revenue in the states during the period of 1981-2012.

Hypothesis

In order to accomplish the following objective, the present work proposes to test following hypothesis:

- That structural shifting of tax revenue has shown deterioration among states during the period under study after economic reform.

Data sources

The study is basically based on secondary data sources. The scope of the study limited to tax revenue across the states during from 1981-2012. The data are collected from Handbook of Statistics of Indian Economy, State Finance of RBI, State Budget Documents, Indian Public Finance Statistic, State Finance Commission Reports and other sources. The main econometrics tools those we apply in this analysis are that dummy variable regression model for structural break of state's tax revenue. Gross tax revenue is regressed on NSDP at factor cost to estimate the elasticity coefficient. The tax data have used in the study relate to 20 states, as some states like Sikkim, Meghalaya, Arunachal Pradesh, Goa and some other states have not found consistent data during the period 1981-2012.

Methodology

In the econometrics analysis the dummy variable regression model provides a significant tool for the structural breaks in the two time periods. The dummy variable approach is useful to the difference in terms of the intercepts as well as the slope of the

two time period. So the dummy variable regression model is

$$\ln(TR)\, t = \alpha + \beta Di + \gamma t + \delta(Dit) + ui$$

Where,

In (TRt) = Dependent variable under study in nature log form;

t = time trend;

D1 = first dummy for the period 1980-81 to1990-91,

D2 = second dummy for the period 1991-92 to 2011-12.

tD2 = an interaction variable to capture the interaction effect of the presence of the attribute in the second period (1991-2012) and the time trend on dependent variable,

α = intercept in the first period (1980-1990);

β = differential intercept in the second period (1991-2012);

γ = regression coefficient of time trend in the first period (1980-1990) which shows the magnitude of rate of response of GDP w.r.t. time;

δ = differential coefficient of time-trend in the second period (1991- 2012) to allow a shift/break/structural change in the magnitude of rate of response of GDP w.r.t. time; and
ui = error term.

In the above regression, (1) (γ*+ δ*), (* shows statistically significant) shows an upward shift in GDP w.r.t. time in the second period (1991-2012); (2) (γ*+ δ*), show a downward shift in GDP w.r.t. time in the second period (1991- 2012); (3) (γ*± δ**), (where ** shows statistically insignificant) shows no shift/ no structural change in GDP w.r.t. time in the second period (1991-2012). In the above regression the additive and the multiplicative dummies are used. The coefficient α is the differential intercept and δ is the differential slope coefficient. If the differential intercept coefficient β is statistically insignificant, then we accept the hypothesis that the two regressions have the same intercept. And if the differential slope coefficient δ is statistically insignificant but β is significant, we may not the reject the hypothesis that the two regressions have same slope that two regression line are parallel. If we find out the present and absent of the attributes in the model than the following structure of the model is analyzed. The first is

$$E(TRt\ Di = 0) = \alpha + \gamma t$$

In the above equation provide the information about the assent the particular attributes. And the second is

$$E(TRt\ Di = 1) = \alpha + \beta + (\gamma + \delta)t$$

In the above equation provide the information about the present the particular attributes.

Empirical analysis

On the basis of above discussion, it was proved the difference of state's tax performance in the pre reform phase and the post reform phase. In the table 1 shows the empirical results of structural breaks of tax revenue in pre reform phase and the post reform phase.

Table 1 .1 structural breaks

$$ln(Y)t = \alpha + \beta Di + \gamma t + \delta(Dit) + ut$$

States	α	γ	β	δ	R^2
Andhra Pradesh	11.25392 (287.0521)*	0.147683 (25.54856)*	0.010315 (0.162640)*	-0.009595 (-1.552656)	0.98
Assam	10.01024 (16.03323)*	0.065205 (0.708334)*	-4.227137 (-4.185266)*	0.157106 (1.596440)	0.78
Bihar	11.20913 (54.55744)*	0.087355 (2.883693)*	-2.060083 (-6.198219)*	0.087279 (2.695088)*	0.95
Gujarat	11.06713 (115.9069)*	0.130289 (9.254690)*	0.034145 (0.221054)	-0.003891 (-0.258556)	0.98
Haryana	10.16098 (288.7044)*	0.139864 (26.95275)*	0.067580 (1.186960)	-0.003792 (-0.683541)	0.93
Himachal Pradesh	8.369486 (76.14316)*	0.202388 (12.48807)*	0.954048 (5.365404)*	-0.086394 (-4.986554)*	0.95
Jammu& Kashmir	8.653628 (89.52540)*	0.201812 (14.16036)*	0.867763 (5.549439)*	-0.081478 (-5.347730)*	0.98
Karnataka	10.59035 (59.91350)*	0.188359 (7.227352)*	0.596477 (2.085970)**	-0.054702 (-1.963358)**	0.96
Kerala	10.64014 (257.4582)*	0.137857 (22.62381)*	0.287609 (4.301909)*	-0.014547 (-2.233166)*	0.99
Madhya Pradesh	11.00273 (146.7428)*	0.142707 (12.90865)*	0.313119 (2.581465)*	-0.025482 (-2.156136)*	0.99
Maharashtra	11.77081 (49.11342)*	0.139510 (3.948001)*	0.743224 (1.916963)*	-0.043502 (-1.151569)	0.90
Manipur	6.493479 (31.52542)*	0.294944 (9.711837)*	1.878077 (5.636337)*	-0.198283 (-6.107348)*	0.94
Nagaland	6.670980 (18.48648)*	0.289581 (5.442696)*	2.234497 (3.827758)*	-0.221123 (-3.887605)*	0.80
Orissa	10.09406 (183.0222)*	0.150679 (18.52976)*	-0.001598 (-0.017908)	-0.007753 (-0.891863)	0.96
Punjab	10.57060 (236.0766)*	0.125978 (19.08215)*	0.150390 (2.076215)*	-0.008533 (-1.209064)	0.99
Rajasthan	10.50211 (288.0996)*	0.150979 (28.09067)*	0.237375 (4.025321)*	-0.015210 (-2.647072)*	0.98
Tamil Nadu	11.37696 (247.9924)*	0.136317 (20.15313)*	0.226997 (3.058669)*	-0.010358 (-1.432449)	0.99
Tripura	6.954801 (46.53648)*	0.269934 (12.25024)*	1.798340 (7.438418)*	-0.170998 (-7.259096)*	0.93
Uttar Pradesh	11.57591 (241.0965)*	0.147146 (20.78560)*	0.079498 (1.023515)	-0.011480 (-1.516905)	0.96
West Bengal	11.17020 (272.1683)*	0.139298 (23.01973)*	0.200843 (3.025052)*	-0.021676 (-3.350747)*	0.94
All State	13.71654 (377.9542)*	0.144928 (27.08478)*	0.159398 (2.715044)*	-0.013652 (-2.386573)*	0.99

***significant at the 1% level **significant at the 5% level ***significant at the 10% level**
#Own Calculation

In the above table the regression results shows the t-test on both the differential intercepts and differential slope coefficients are statistically significant at 1 percent level. So the regression or the trend of tax revenue in two time period is structurally different.

The structural break of the tax revenue in pre and post reform phase is given below:-

Table 1.2 tax revenue (pre and post reform period)

	Pre reform		Post reform					
States	α	γ	α	β	$\alpha+\beta$	γ	δ	$\gamma+\delta$
Andhra Pradesh	11.2539	0.0103	11.2539	0.0103	11.2642	0.0103	-0.0095	0.0008
Assam	10.0102	-4.2271	10.0102	-4.2271	5.7831	-4.2271	0.1571	-4.07
Bihar	11.2091	-2.0600	11.2091	-2.0600	9.1491	-2.0600	0.0872	-1.9728
Gujarat	11.0671	0.0341	11.0671	0.0341	11.2432	0.0341	-0.0038	0.0303
Haryana	10.1609	0.0675	10.1609	0.0675	10.8359	0.0675	-0.0037	0.0638
Himachal Pradesh	8.3694	0.9540	8.3694	0.9540	9.3234	0.9540	-0.0863	0.8677
Jammu& Kashmir	8.6536	0.8677	8.6536	0.8677	9.5213	0.8677	-0.0814	0.7863
Karnataka	10.5909	0.5964	10.5909	0.5964	11.1873	0.5964	-0.0547	0.5417
Kerala	10.6401	0.2876	10.6401	0.2876	10.9277	0.2876	-0.0145	0.2731
Madhya Pradesh	11.0027	0.3131	11.0027	0.3131	11.3158	0.3131	-0.0254	0.2877
Maharashtra	11.7708	0.7432	11.7708	0.7432	12.5140	0.7432	-0.0435	0.6997
Manipur	6.4934	1.8780	6.4934	1.8780	8.7278	1.8780	-0.1982	1.6798
Nagaland	6.4709	2.2344	6.4709	2.2344	8.7053	2.2344	-0.2211	2.0133
Orissa	10.0940	-0.0015	10.0940	-0.0015	10.0925	-0.0015	-0.0077	-0.0092
Punjab	10.5706	0.1503	10.5706	0.1503	10.7209	0.1503	-0.0085	0.1418
Rajasthan	10.5021	0.2373	10.5021	0.2373	10.7394	0.2373	-0.0152	0.2525

Tamil Nadu	11.3769	0.2269	11.3769	0.2269	11.6038	0.2269	-0.0103	0.2166
Tripura	6.9548	1.7983	6.9548	1.7983	8.7531	1.7983	-0.1709	1.6274
Uttar Pradesh	11.3759	0.0794	11.3759	0.0794	11.4553	0.0794	-0.0114	0.068
West Bengal	11.1702	0.2008	11.1702	0.2008	11.3710	0.2008	-0.0216	0.1792
All State	13.7165	0.1593	13.7165	0.1593	13.8758	0.1593	-0.0136	0.1497

***significant at the 1% level **significant at the 5% level ***significant at the 10% level**

#Own Calculation

In the above table shows the structure changes of the tax revenue in pre and the post reform phase. The intercepts of tax revenue is increase in post reform phase as compression to the pre reform phase. The slope coefficients of tax revenue are decrease in post reform phase as compression to the pre reform.

Table 1 .3 structural shifts in tax revenue during pre and post reform period

State	Pre reform	Post reform	Direction
Andhra Pradesh	11.25	11.26	No shift
Assam	10.01	5.78	No shift
Bihar	11.20	9.14	Downward
Gujarat	11.06	11.24	No shift
Haryana	10.16	10.83	No shift
Himachal Pradesh	8.36	9.32	Upward
Jammu& Kashmir	8.65	9.52	Upward
Karnataka	10.59	11.18	Upward
Kerala	10.64	10.92	Upward
Madhya Pradesh	11.00	11.31	Upward
Maharashtra	11.77	12.51	No shift
Manipur	6.49	8.72	Upward
Nagaland	6.47	8.70	Upward
Orissa	10.09	10.09	No shift
Punjab	10.57	10.72	No shift
Rajasthan	10.50	10.73	Upward
Tamil Nadu	11.37	11.60	No shift
Tripura	6.95	8.75	Upward
Uttar Pradesh	11.37	11.45	No shift
West Bengal	11.17	11.37	Upward
All State	13.71	13.87	Upward

#Table based on the above table no. 1 & 2

Table 3 give the tax revenue of different states for the period of 1981 to 2012. There are some states which reveal an almost continuous movement in same direction. Among these states which shows downward trend during the pre and post reform is Bihar and Andhra Pradesh, Assam Maharashtra, Gujarat, Haryana, Orissa, Punjab, Tamil Nadu, Uttar Pradesh shows no shift in growth performance. The highest growth during pre-reform was of Maharashtra and this was followed by Tamil Nadu and Uttar Pradesh but the picture had same after the reform, this time Gujarat also got the highest growth followed by Tamil Nadu. Over all state' tax revenue is upward shift trend during the pre and post reform.

Summary and Conclusion

In the present study mainly concentrated on the state`s tax performance between pre and post reform period. The structure of the tax revenue changes time to time due to changes make by government in its policies. The objective of this study to finds out the structural shifting of tax revenue in states. In this purpose the Dummy Variable Regression Model had been applied. The study is basically based on secondary data sources. The scope of the study limited to tax revenue across the states during from 1981-2012. The data are collected from State Finance of RBI, Indian Public Finance Statistic and so on. Over all state' tax revenue is upward shift trend during the pre and post reform. In this same period, we find out to some states move upward and some states show that there is no structural shifting in their tax revenue. But Bihar move downward trend in tax revenue.

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