

Measurement of Taxable Capacity and Tax Efforts of Indian States

N. K. Bishnoi^{1*}, Tanu Juneja² and Satbir Singh³

¹Professor, Haryana School of Business, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India. Email: nkbishnoi123@gmail.com

²Research Scholar, Haryana School of Business, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India. Email: juneja.tanu06@gmail.com

³Research Scholar, Haryana School of Business, Guru Jambheshwar University of Science and Technology, Hisar, Haryana, India. Email: nainsatbir@gmail.com

*Corresponding Author

Abstract: It is believed that effective tax system helps in raising revenue and it can be done by expanding the tax base. Indian state's tax system does not have any benchmark which can give an objective to government that how much tax they can exploit according to present tax rate. In this study we have tried to give benchmark to the Indian state governments to realize their taxable capacity to the maximum with the help of regression coefficient of fixed effect test and random effect test for the period of 2004-2005 to 2014-2015. The study take into account different sources of tax revenue of the states as dependent variable and its proxies which affect the capacity factors are considered as independent variables and measured the taxable capacity and tax efforts made by the Indian state governments.

Keywords: Effective tax system, Revenue, Tax, Tax efforts, Taxable capacity.

I. INTRODUCTION

Income from tax revenue of India is lower than the tax revenue collecting by other countries which comes in the same rank under the classification of developing countries. According to IMF (2011), tax to GDP ratio of middle income group countries was 18 percent and for India it was 16 percent for the period of 1980-2009. Tax to GDP ratio of India is unfavorable not only at international level but it is deteriorating or static at national and sub national level also.

In India assignment of powers to collect tax is done in such a way that the authority to charge wide-ranging based tax are given to central government while authority of state governments is to collect tax that is limited to only sub national territory. Therefore, central government earns more taxes than their requirement and this create fiscal imbalance between the center and state governments (Purohit, 2006). State governments are political entities and the major taxes which state governments

includes are sales and purchase tax, stamp duty and registration tax, excise duty and motor vehicle tax.

Though Indian Constitution authorized state governments to charge number of taxes but near about 60 percent of the state own tax revenue comes from taxes charged on sales and purchase of goods. State tax revenue as percent of GSDP has shown an increasing trend from 6.3 percent in 2001 to 7 percent in 2006 but this raise was mainly due to increase in state sales tax and stamps duty and registration fees. This ratio came down in 2010 to 6.5 percent of GDP before recuperating to 7.6 percent of GDP in the year 2013. For the latest year 2014-2015, tax to GSDP ratio again came down to 6.7 percent. This trend was approximately same when we considered the non special category and special category states separately. One key element of states own tax revenue is interstate discrepancy which cannot be elucidated by the capacity factors and not even by taking special category and non special category separately. After analyzing the state specific growth rate of state own tax revenue we found that growth rate of own tax revenue of some poor states was higher as compare to rich states. Growth rate of own tax revenue of Bihar was 11.87 percent during the period of 1991-2004 and it increased to 19.10 percent in the period 2005-2015. In low income states i.e. Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, there was an increase of near about 3.5 percent during 2005 to 2015. While the growth rate of states own tax revenue of rich states was not so high as in Kerala it was only 0.3 percent, in case of Haryana the growth rate was 1 percent and in Punjab it was 2.3 percent. These figures demonstrate that the tax efforts made by states to collect revenue differ irrespective to their financial position. One of the key reasons for this diversion is that state governments do not have any bench mark to evaluate performance of the tax system.

It is believed that effective tax system helps in raising revenue and it can be done by expanding the tax base. But in case of state governments it is not up to mark as from the year 1991 to

2013-2014, states own tax revenue has contributed only 6.84 percent in GDP while among this little share, contribution of VAT alone is 4.11 percent of GDP. According to Rao (2015) there are various reasons for narrow tax base which include high range of exemptions, deductions, concession given in direct and indirect taxes, ambiguity in tax law and low capacity of tax administration. But one major factor which needs to bring into notice of policy makers is that Indian state's tax system does not have any benchmark which can give an objective to government that how much tax they can exploit according to present tax rate. Generally, it is believed that low tax effort of Indian state government is due to inefficiency in tax administration and existence of corruption in tax system. However, the fact is along with these reasons one basic factor which is ignored in literature is that we do not have any benchmark against which the tax efforts should be assess.

In view of the above we decided to give a benchmark of collection of tax revenue from different tax bases to the Indian state governments. Best possible way of doing this is through measuring taxable capacity. Therefore, we selected 14 non special category and 8 special category states for this purpose and estimated potential taxable capacity for the period of 2004-2005 to 2014-2015 (detailed explanation for choosing these states is mentioned further). In order to give benchmark for revenue potential, an exercise called tax efforts was done in which ratio of states actual tax revenues and its tax potential was estimated. This ratio describes how far or how close a state government is, to its taxable capacity and in which tax base improvement is needed.

II. MEANING OF TAXABLE CAPACITY

Taxable capacity or fiscal capacity specifically of revenue account may be defined as the amount of tax that can be collected by applying a standard rate to its revenue base. Le *et al.* (2008) defined taxable capacity as tax to GDP ratio estimated using the coefficient of regression equation considering the country specific characteristics. Tax effort measures the extent to which a government uses its capacity to raise revenue with taxation (ACIR). Tax efforts can also be defined as the index of the ratio of its actual revenue through taxation to its predicted taxable capacity.

Broadly, there are three major approaches which are used in literature to compute taxable capacity and tax efforts i.e. income approach, aggregate regression approach and representative tax approach (Bahl, 1972; Rao, 1993; Paincastelli, 2001; Purohit, 2006; and Garg *et al.* 2014). Income approach is the oldest approach among the three approaches. According to income approach most of the taxes are paid from the current income therefore income of a state is considered as a critical measure to estimate taxable capacity. Further, tax efforts is estimated by using three ratios i.e. tax income ratio, income elasticity of tax revenue and incremental tax income ratio. Some of the important studies which have used income approach as measure of taxable capacity are (Frank, 1959; Bird, 1964; Aaron, 1965 and Sastri,

1966). Later on this method was considered an inappropriate measure as it was assumed that taxable capacity depends only on income ignoring other relevant factors. Therefore, in the latest studies income approach is not used. Second approach is aggregate regression approach. Regression approach is an improvement over the income approach because it takes into account all the relevant parameters like sectoral GSDP, geographical, demographical, social and political variables of the country or state which affects taxable capacity. These parameters are used as independent variables. In the regression approach, a relationship between the taxable capacity factors and tax ratio is identified. Some notable studies which have used regression approach are (Dwivedi, 1980; Oommen, 1987; Ninth Finance Commission, 1988; Sarma, 1991; Purohit, 2006 and Mahdavi, 2013). Third approach, available in literature is representative tax system approach. Under this approach, actual tax base or their close proxies for each tax are identified and effective tax rate (ratio of actual tax revenue to actual tax base) is estimated. With the help of these effective rates for each tax base, normative tax rate is calculated which leads to measure taxable capacity. In literature, various key studies are there which have used Representative Tax System approach i.e. (ACIR, 1962; Bahl, 1972 and Purohit, 2006). We have adopted aggregate regression approach for our analysis because income approach considers only income as key factor to estimate taxable capacity and representative tax system approach take into account the close proxies for each tax base which is very difficult to find for each tax (Thimmaiah, 1979 and Rao, 1993) specially in case of sub national level. Therefore, we decided to adopt multiple regression approach for our analysis as our endeavor was to estimate the taxable capacity and tax effort of sub national governments.

III. METHODOLOGY AND DATA DESCRIPTION

According to the regression approach taxable capacity refers to the predicted tax-GSDP ratio estimated from a regression equation. Tax effort of the states can be defined as the index of the ratio between the predicted taxable capacity and the actual revenue. To estimate the tax effort of states first step is to estimate potential revenues from taxes and for this purpose we follow the framework of Sen (1997). Methodology given by Sen (1997) used a disaggregated framework and take into account separate regression for each groups of taxes. Tax effort is estimated separately for all the special category and non-special category states with the exception of Jharkhand, Chhattisgarh and Uttaranchal, Jammu and Kashmir, Nagaland and Goa due to non-availability of data for many variables. Fourteen non special category states that were included in the study are Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. Eight special category states that were included in the study are Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Sikkim and Tripura. The study is based on the data started from 2004-2005 to 2014-2015 (latest data). We have taken the post FRBM Act

data (adopted by the centre in 2003) for the analysis due to the reason that there was a sharp change in the trends of revenues after the implementation of FRBM Act. According to economic survey of 2017, revenue receipts of state governments increased from 12.3 percent of GSDP (average of 10 years prior to FRBM Act) to 14.2 percent of GSDP (average of 11 years after the implementation of FRBM Act). Using the post FRBM Act data has an advantage that it will help in isolating the impact of other factors like VAT adoption, central transfer and upward trend of GSDP (Economic Survey, 2016-2017).

The pertinent data for the tax revenues was obtained from the Handbook of statistics on state government finances published by Reserve Bank of India. Census data was taken from the Planning Commission reports. Data for the GSDP was taken from the Central Statistical Organization.

Tax efforts of the Indian states were calculated on a disaggregated basis for the following groups of taxes as suggested by the Sen (1997). These groups were made due to the same set of tax base proxies and possibly at some degree of interchangeability within each group of taxes. Groups of following tax bases were made for estimating the taxable capacity and tax efforts of the states (1) Land revenue (2) Stamps duty and registration fees (3) Excise duty (4) State sales tax (5) Motor vehicle tax. These tax bases together generate 90 percent share of states own tax revenue therefore they were considered as the dependent variables of the study and the variables which affect the capacity factors of these tax bases were considered as independent variables. These independent variables are also called as proxies of the tax bases. Panel regression has been used for estimating the tax efforts of individual taxes of Indian states. Further the appropriateness of fixed and random effect model was determined with the Hausman test. To estimate the tax potential of the states following traditional tax bases suggested by Sen (1997) and Purohit (2006) were used:

A. Land Revenue

Land revenue includes basic revenues from land, surcharge, betterment taxes and special crop ceases. Taxable amount of the land depends upon productivity and the volume of landholdings. Both these factors of land revenue determine the revenue generated from agriculture. Therefore, primary sector GSDP can be considered as the proxy of land revenue. The function for tax effort analysis of land revenue is:-

$$\text{Log (LR)} = a + b \log (\text{PGSDP})$$

B. Stamp Duty and Registration Fees

Stamp duty and registration fees are charged by the government when transfer of various financial institutes occurs. For registering various kinds of instruments like movable and immovable properties, fixed amount as registration fees is charged by the government. Therefore, proxy for this tax base is assumed as the share of SDP from construction and real

estate along with ownership of dwelling and business services, population density and urbanizations (Purohit, 2006). The function for tax effort analysis of stamp duty and registration fees is:-

$$\text{Log (SD)} = a + b \log (\text{REALCON, URBAN, POPDEN})$$

C. State Excise Duty

The tax collected by the state government on alcohol, alcoholic preparation and narcotic substances is called excise duty. Major part of revenue from this tax comes from alcohol and proxy for this tax base can be consumption of liquor, data for which is difficult to obtain. Therefore, Sen (1997) suggested per capita gross state domestic product as proxy for this tax. The function for tax effort analysis of state excise duty is:-

$$\text{Log (SED)} = a + b \log (\text{PCSDP})$$

D. State Sales Tax

State sales tax is a direct tax charged by the state government on sales and purchase of goods and services in the states. Sales tax is charged in all the states but the rate structure of different commodities varies from state to state. Sales tax contribute more than half in total own tax revenues and it is called as tax charged on the consumption of goods and services when there is sale of goods to the consumer. Proxies for the sales tax base are annual per capita household consumption expenditure and share of manufacturing state domestic product. The function for tax effort analysis of state sales tax is:-

$$\text{Log (SST)} = a + b \log (\text{APCE, MANU})$$

E. Motor Vehicle Tax

Motor vehicle tax is charged under the Indian Motor Vehicle Act 1939, on registration of new vehicles, issuance of permits and certificates for the maintenance of transport vehicles, for attaining a driving license and transferring ownership of vehicles. Rate structure for motor vehicle taxes depends upon type of vehicle and varies from state to state. Taxes on Private motor vehicles are charged at higher rate. Proxies for Motor Vehicle Tax are share of GSDP from transport sector and total number of registered vehicles in a state. The function for tax effort analysis of Motor Vehicle Tax is:-

$$\text{Log (MVT)} = a + b \log (\text{TSDP, REGVEH})$$

IV. ESTIMATION OF RESULTS

Following the traditional practice, an attempt was made to estimate taxable capacity of Indian states for the period of 2005 to 2015 (actual latest data). For each tax base, separate regression has been made to predict the taxable capacity of Indian states. For a detail analysis of Indian states, special category states and

non-special category states were tested separately as economic conditions for both categories are different.

A. Estimates for Non Special Category States

While checking the appropriateness of fixed and random effect model in non special category states Hausman test suggested that for the tax bases land revenue, state excise duty and state sales tax and motor vehicle tax, random effect model was appropriate and for the tax base stamps duty and registration fixed effect was appropriate.

$$\text{Log (LR)} = -1.19 + 0.75 \log (\text{PGDP}) \quad R^2 = 0.95$$

$$(-2.88) (11.38)^* \quad (1)$$

$$\text{Log (STAMPS)} = -9.98 + 0.51 \log (\text{REALCON}) + 0.21 \log (\text{URBAN}) + 3.7 \log (\text{POP DEN}) \quad R^2 = 0.95$$

$$(-2.33) (3.17)^* (0.54) (3.00)^* \quad (2)$$

$$\text{Log (MVT)} = -3.14 + 0.41 \log (\text{TSDP}) + 0.74 \log (\text{REGVEH}) \quad R^2 = 0.89$$

$$(-8.45) (7.49)^* (8.46)^* \quad (3)$$

$$\text{Log (SED)} = -1.24 + 1.18 \log (\text{PCSDP}) \quad R^2 = 0.85$$

$$(-5.25) (29.63)^* \quad (4)$$

$$\text{Log (SST)} = -1.37 + 0.57 \log (\text{MANU}) + 0.70 \log (\text{APCE}) \quad R^2 = 0.92$$

$$(-7.16) (7.26)^* (9.83) \quad (5)$$

B. Estimates for Special Category States

Hausman test in case of special category state suggested that for the tax base land revenue, motor vehicle tax and state excise duty, random effect model was appropriate and for the tax base stamps duty and registration and state sales tax, fixed effect technique was appropriate.

$$\text{Log (LR)} = -3.61 + 1.17 \log (\text{PGDP}) \quad R^2 = 0.98$$

$$(-4.57) (6.74)^* \quad (6)$$

$$\text{Log (STAMPS)} = -11.97 + 0.34 \log (\text{REALCON}) + 0.15 \log (\text{URBAN}) + 5.6 \log (\text{POP DEN}) \quad R^2 = 0.98$$

$$(-4.70) (1.87) (0.42) (4.59) \quad (7)$$

$$\text{Log (MVT)} = -1.948 + 0.804 \log (\text{TSDP}) + 0.272 \log (\text{REGVEH}) \quad R^2 = 0.76$$

$$(-5.55) (6.60)^* (2.29)^* \quad (8)$$

$$\text{Log (SED)} = -2.37 + 1.07 \log (\text{PCSDP}) \quad R^2 = 0.80$$

$$(-5.91) (18.72)^* \quad (9)$$

$$\text{Log (SST)} = -2.163 + 0.209 \log (\text{MANU}) + 1.055 \log (\text{APCE}) \quad R^2 = 0.93$$

$$(-5.84) (2.16)^* (8.87)^* \quad (10)$$

Note: -The sign * indicates significance at 5 percent, figures in parenthesis indicate t statistics.

C. Interpretation of Results

The estimated results for the specifications given in previous section for 14 non special category states and 8 special category states are presented in following tables. In the first step, tax capacity of the states was defined as the predicted values using the estimated regression equations of all the capacity indicators selected for the study. In the next step, tax efforts were derived as the ratio between the actual tax revenue and predicted taxable capacity. In the last step, states were ranked according to their tax effort. Highest rank denotes that state has utilized well its tax base to increase revenues and lowest rank denotes that state has further scope to increase its revenue from this particular tax base. The aggregate or cumulative taxable capacity for a state is estimated as sum of disaggregated taxable capacity. An aggregate tax effort was derived as the ratio of aggregate actual tax revenue to aggregate taxable capacity. Actual tax revenue, taxable capacity and tax efforts of non special category states and special category states are given in the Tables I to XI.

TABLE I: TAXABLE CAPACITY AND TAX EFFORT OF NON - SPECIAL CATEGORY STATES - LAND REVENUE RS. MILLION

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Andhra Pradesh	1109.58	2730.53	40.63	12
Bihar	1328.78	1416.25	93.82	8
Gujarat	11450.45	2004.73	571.16	2
Haryana	115.32	1390.38	8.29	14
Karnataka	1685.82	1421.96	118.55	7
Kerala	681.41	1118.18	60.93	11
Madhya Pradesh	2360.89	1909.02	123.66	6
Maharashtra	7763.98	2551.83	304.25	4
Orissa	3412.67	1081.97	315.41	3

Punjab	240.11	1605.23	14.95	13
Rajasthan	1906.95	2076.50	91.83	9
Tamil Nadu	1408.82	1661.83	84.77	10
Uttar Pradesh	5211.19	3380.04	154.17	5
West Bengal	14212.29	2278.60	623.7	1

TABLE II: TAXABLE CAPACITY AND TAX EFFORT OF SPECIAL CATEGORY STATES - LAND REVENUE

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Arunachal Pradesh	40.68	46.6	87.3	6
Assam	1129.63	576.3	196.0	4
Himachal Pradesh	104.65	191.5	54.6	7
Manipur	10.23	28.6	35.7	8
Meghalaya	34.92	32.7	106.7	5
Mizoram	31.40	13.3	235.4	2
Sikkim	33.08	7.0	473.1	1
Tripura	83.08	42.2	196.8	3

Taxable capacity and tax efforts of the tax base, land revenue using the regression equations 1 and 6 are given in Table I (non special category states) and Table II (special category states). As we can see that in some of states like Gujarat, Haryana, Kerala, Maharashtra, Orissa, Punjab, Uttar Pradesh, West Bengal, Assam, Himachal Pradesh and Manipur the difference between actual tax revenue and taxable capacity is so high and to elucidate this uncertainty we refer to many studies which measured the taxable capacity of Indian states most important among them is Purohit (2006) which also gave similar result with different time period and states therefore, we decided to move forward with these results.

Table I indicates that among the non-special category states West Bengal has made maximum efforts meaning that it has utilized well its taxable capacity to increase revenue. Andhra Pradesh, Punjab and Haryana have performed worst as they were not been able to obtain revenue from this tax base. In order to verify the reliability of our ranking, we compared our results with other key studies i.e. Sen (1997), Purohit (2006) and Raju (2012) which have adopted same methodology with different time span. We found that score attained by non special

category states was almost similar as per our ranking. Purohit (2006) have given lowest rank to Haryana in collecting revenue from land revenue and Raju (2012) also ranked land revenue as lowest area of tax collection and first rank to West Bengal in collecting revenue from land. Haryana and Punjab did not performed satisfactorily in both of the phases as they were not able to obtain revenue from this tax base. Sen (1997) gave reason for low tax revenue collection of Haryana and Punjab that in both of the states. Purohit (2006) stated that distribution of land holdings is unequal in India and in some states small holdings are free from tax, only the owners of large holdings have to pay tax, which affects the income from agriculture. Therefore, there are huge difference between revenue realized and revenue potential of state governments. Significant amount of revenue comes from market committee fees and not classified in taxes. Gujarat, Orissa and Maharashtra have performed satisfactory with respect to this specific tax base. Table II shows that among special category states Sikkim have scored first rank it shows that it has ensured maximum utilization of this tax base in order to increase revenue. Manipur has performed worst as it scored 8th position in ranking of this tax base. Mizoram, Tripura and Assam have performed satisfactory.

TABLE III: TAXABLE CAPACITY AND TAX EFFORT OF NON - SPECIAL CATEGORY STATES - STAMPS DUTY AND REGISTRATION FEES

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Andhra Pradesh	32635.5	9584.33	340.50	7
Bihar	12655.78	48730	2.59	14
Gujarat	29873.43	6951.43	429.74	4
Haryana	20876.58	45960.27	45.42	10
Karnataka	38849.88	9934.62	391.05	6
Kerala	20958	288710.6	7.25	12
Madhya Pradesh	22617.24	2072.812	1091.13	3
Maharashtra	115923.6	28302.5	409.58	5

Orissa	57945.58	2133.66	2715.77	1
Punjab	20528.29	31247.24	65.69	8
Rajasthan	19680.67	1218.30	1615.41	2
Tamil Nadu	48579.65	93473.61	51.97	9
Uttar Pradesh	60550.44	382627.4	15.82	11
West Bengal	23442.51	646563.2	3.62	13

TABLE IV: TAXABLE CAPACITY AND TAX EFFORT OF SPECIAL CATEGORY STATES - STAMPS DUTY AND REGISTRATION FEES

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Arunachal Pradesh	18.7	0.001697	1101764	1
Assam	1432.127	257093.2	0.55	7
Himachal Pradesh	1261.3	255.67	493.32	3
Manipur	43.86364	147.04	29.83	6
Meghalaya	80.83636	244.76	33.026	5
Mizoram	7.709091	1.08	707.47	2
Sikkim	47.13636	13.57	347.22	4
Tripura	237.7455	69379.89	0.34	8

Taxable capacity and tax effort for the tax base stamps duty and registration fees, using the regression equations 2 and 7 are given in Table III (non special category states) and Table IV (special category states). Table III represents that among non special category states Orissa has made maximum effort to raise revenue from this tax. Bihar has scored lowest in the ranking of efforts means it has contributed least in collecting revenue from stamps duty and registration fees. Rajasthan, Madhya Pradesh and Gujarat have performed satisfactory in the ranking of this tax revenue. Purohit (2006) stated that low tax efforts in collecting revenue from stamps duty and registration fees shows that state governments have under estimated the values of property to avoid tax. Table IV shows that among non special category states, Arunachal Pradesh has score maximum and Tripura has performed worst in collecting revenue from stamps duty and registration fees. Mizoram, Himachal Pradesh and Sikkim have performed satisfactory in collecting revenue from this tax.

TABLE V: TAXABLE CAPACITY AND TAX EFFORT OF NON SPECIAL CATEGORY STATES - MOTOR VEHICLE TAX

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Andhra Pradesh	22982.91	19034.24	120.75	4
Bihar	4646.97	3859.23	120.41	5
Gujarat	17408.46	22400.4	77.71	12
Haryana	5143.2	9806.67	52.45	14
Karnataka	24131.96	16333.79	147.74	2
Kerala	12943.28	11833.09	109.38	7
Madhya Pradesh	10529.71	9051.33	116.33	6
Maharashtra	31428.7	38560.15	81.51	10
Orissa	6179.38	6195.60	99.74	9
Punjab	7199.23	7123.18	101.07	8
Rajasthan	16046.38	11255.76	142.56	3
Tamil Nadu	23472.8	28981.34	80.99	11
Uttar Pradesh	18960.69	25857.84	73.33	13
West Bengal	8644.30	5298.76	163.14	1

TABLE VI: TAXABLE CAPACITY AND TAX EFFORT OF SPECIAL CATEGORY STATES - MOTOR VEHICLE TAX

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Arunachal Pradesh	97.99	92.08	106.42	4
Assam	2247.53	2515.22	89.36	6
Himachal Pradesh	1457.63	969.32	150.38	3
Manipur	86.19	142.34	60.55	7
Meghalaya	205.38	411.42	49.92	8
Mizoram	104.05	63.09	164.91	2
Sikkim	105.45	50.40	209.24	1
Tripura	264.79	283.58	93.37	5

Taxable capacity and tax effort for the tax base Motor vehicle tax by using the regression equations 3 and 8 are given in Table V (non special category states) and Table VI (special category states). Table VI indicates that among non special category states, West Bengal has achieved highest score in putting effort to collect revenue from motor vehicle tax. Karnataka, Rajasthan and Andhra Pradesh have also performed satisfactory in this tax

revenue. Haryana has placed least effort to raise revenue from motor vehicle tax. Table VI represents that in case of special category states, Sikkim, Mizoram and Himachal Pradesh have obtained first, second and third positions respectively meaning that these states have contributed the most in collection of revenue from motor vehicle tax. Meghalaya has performed worst it means that it was least tax contributor in the tax base motor vehicle tax.

TABLE VII: TAXABLE CAPACITY AND TAX EFFORT OF NON SPECIAL CATEGORY STATES - STATE EXCISE DUTY

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Andhra Pradesh	55877.23	14093.77	396.46	2
Bihar	14161.53	6711.552	211.00	5
Gujarat	699.1091	37295.51	1.87	14
Haryana	20325.01	45608.41	44.56	12
Karnataka	76290.55	28171.54	270.80	3
Kerala	14761.85	35430.3	41.66	13
Madhya Pradesh	33470.95	14388.27	232.62	4
Maharashtra	61054.08	40450.64	150.93	7
Orissa	9952.118	17697.83	56.23	11
Punjab	24241.28	34922.82	69.41	10
Rajasthan	28516.46	19242.09	148.19	8
Tamil Nadu	61777.5	34027.5	181.55	6
Uttar Pradesh	66756.4	10786.47	618.89	1
West Bengal	17110.08	20605.76	83.03	9

TABLE VIII: TAXABLE CAPACITY AND TAX EFFORT OF SPECIAL CATEGORY STATES - STATE EXCISE DUTY

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Arunachal Pradesh	292.83	542.34	53.99	6
Assam	3432.5	296.04	1159.44	1
Himachal Pradesh	5537.63	720.22	768.88	2
Manipur	61.05	289.97	21.06	7
Meghalaya	997.57	429.60	232.21	3
Mizoram	23.38	503.42	4.64	8
Sikkim	700.59	1029.89	68.03	5
Tripura	726.93	422.77	171.95	4

Taxable capacity and tax effort for the tax base state excise duty by using the regression equations 4 and 9 are given in Table VII (non special category states) and Table VIII (special category states). Revenue collection from state excise duty depends upon the prohibition policy of different state governments (Sen, 1997). Table VII states that among the non special category states, Uttar Pradesh has made maximum effort in collecting revenue from state excise duty as this state's rank was first. Andhra Pradesh, Karnataka and Madhya Pradesh have also

performed reasonably well as their rank was second, third and fourth respectively in collecting revenue from state excise duty. Gujarat has performed worst in this tax base as this state's rank was 14. This may be due to existence of prohibition policy in Gujarat. Table VIII states that Assam, Himachal Pradesh and Meghalaya have scored first, second and third positions respectively. It denotes that, among the special category states, these states contributed most in collecting revenue from state excise duty. Mizoram came out as least contributor in collecting revenue from state excise duty as its rank was last.

TABLE IX: TAXABLE CAPACITY AND TAX EFFORT OF NON SPECIAL CATEGORY STATES - STATE SALES TAX

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Andhra Pradesh	245853.4	165281.6	148.75	2
Bihar	46926.28	38395.52	122.22	5
Gujarat	198587.6	234625	84.64	11
Haryana	92611.07	158232	58.53	14
Karnataka	185737.3	162262.3	114.47	6
Kerala	140944.2	103983.8	135.54	3
Madhya Pradesh	90203.16	83239.21	108.37	7
Maharashtra	357129.6	336692.2	106.07	8
Orissa	57945.58	69797.54	83.02	12
Punjab	83778.28	131232.3	63.84	13
Rajasthan	102676	118705.4	86.50	10
Tamil Nadu	274549.5	206281.9	133.09	4
Uttar Pradesh	210395.6	136529.3	154.10	1
West Bengal	116888.3	119597.5	97.73	9

TABLE X: TAXABLE CAPACITY AND TAX EFFORT OF SPECIAL CATEGORY STATES - STATE SALES TAX

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Arunachal Pradesh	1286.918	2513.30	51.20	6
Assam	36375.96	4747.10	766.28	1
Himachal Pradesh	14363.27	6868.36	209.12	2
Manipur	2054.573	2089.55	98.33	4
Meghalaya	2585.2	3045.91	84.87	5
Mizoram	973.5	2040.69	47.70	7
Sikkim	1128.555	4136.29	27.28	8
Tripura	4700.445	2342.52	200.66	3

Taxable capacity and tax efforts of the tax base state sales tax by using regression equations 5 and 10 are given in Table IX (non special category states) and Table X (special category states). More than 50 percent of total tax revenue is contributed by sales tax. Therefore, tax effort of sales tax determines the overall tax efforts of states Sen (1997). Rate structure of sales tax varies from commodity to commodity in different states. Result indicates that Uttar Pradesh, Andhra Pradesh and Kerala

have scored first, second and third positions respectively. The majority of the states have higher actual revenue from state sales tax than taxable capacity. Punjab and Haryana contributed least in collecting revenue from state sales tax. In case of special category states, Assam, Himachal Pradesh and Tripura managed to score first, second and third positions as they collected maximum revenue for the tax base state sales tax. Mizoram and Sikkim were recorded as least contributor as they scored last positions.

TABLE XI: AGGREGATE TAXABLE CAPACITY AND TAX EFFORT OF NON SPECIAL CATEGORY STATES

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Andhra Pradesh	358458.64	210724.51	170.11	1
Bihar	79719.35	537686.55	14.83	14
Gujarat	258019.03	303277.09	85.08	8
Haryana	139071.18	260997.75	53.28	11
Karnataka	326695.50	218124.17	149.78	2
Kerala	190288.69	441075.98	43.14	12
Madhya Pradesh	159181.95	110660.65	143.85	3
Maharashtra	573299.88	446557.30	128.38	5
Orissa	135435.34	96906.62	139.76	4
Punjab	135987.20	206130.73	65.97	9
Rajasthan	168826.49	152498.03	110.71	7
Tamil Nadu	409788.26	364426.14	112.45	6
Uttar Pradesh	361874.29	559181.13	64.72	10
West Bengal	180297.45	794343.77	22.70	13

Aggregated taxable capacity of a particular state was estimated by adding all the revenue (land revenue, motor vehicle tax, state excise duty, revenue from stamps duty and registration fees and state sales tax) and their corresponding taxable capacity (estimated in Tables I-X). Similarly, tax efforts of each state were estimated as the ratio of actual total revenue and its taxable capacity. States were ranked according to their tax efforts to indicate that whether the state is making sufficient efforts to collect revenue from taxes. Results of Table XI indicates that

among non special category states, Andhra Pradesh is making maximum tax effort as it scored highest and Karnataka, Madhya Pradesh and Orissa stood at second, third and fourth ranks respectively. Bihar stood last in ranking of tax effort. Among special category states (Table XII) Himachal Pradesh stood as rank first it indicates that this state has made maximum tax efforts in collecting revenue. Tripura has scored lowest rank; it shows that this state has contributed least in collecting revenue among all special category states.

TABLE XII: AGGREGATE TAXABLE CAPACITY AND TAX EFFORT OF SPECIAL CATEGORY STATES

States	Actual Revenue	Taxable Capacity	Tax Effort	Rank
Arunachal Pradesh	1737.13	3194.35	54.38	4
Assam	44617.75	265227.80	16.82	7
Himachal Pradesh	22724.48	9005.07	252.35	1
Manipur	2255.91	2697.55	83.63	3
Meghalaya	3903.91	4164.44	93.74	2
Mizoram	1140.04	2621.64	43.49	5
Sikkim	2014.82	5237.14	38.47	6
Tripura	6013.00	72470.99	8.30	8

V. CONCLUSION

The study measured the relative tax efforts of the 14 non special category and 8 special category states for the period of 2005 to 2015. Performances of both special category and non special category states were classified in three categories. First category was best performing states which have scored highest positions (1 to 5) in tax efforts ranking, second category was poor performing states which remained low (10 to 14). The third category was medium level performing states which have scored the ranking in the range of 6 to 9 positions. On the bases

of these ranking we stated the weaker tax collection area of all the state governments. Results concluded that Andhra Pradesh and Himachal Pradesh have not put sufficient effort to collect revenue from land. Bihar, West Bengal and Tripura need to put more efforts in collecting revenue from stamps duty and registration fees as they scored lowest rank. Maharashtra and Meghalaya need to improve their ranking in terms of collecting revenue from motor vehicle tax. Punjab and Arunachal Pradesh need to put more tax efforts in collecting revenue from land, state excise duty and state sales tax. Orissa and Mizoram are advised to improve their ranking in collecting revenue from

state excise duty and state sales tax. Rajasthan and Sikkim has recorded state sales tax as their low tax area. Uttar Pradesh and Assam need to put more tax efforts in collecting revenue from stamp duty and registration fees and motor vehicle tax. Haryana and Manipur have performed poor as they have scored lowest positions in collecting revenue from all the five tax bases taken in study (except state sales tax in case of Manipur). So, these states are advised to review their tax receipts procedure. Karnataka and Madhya Pradesh performed well in collecting revenue from all the tax bases and recorded no weaker area. Gujarat and Kerala state governments need to put more tax effort in three out of five tax bases i.e. motor vehicle tax, state excise duty and state sales tax, in case of Gujarat and land revenue, stamp duty and registration fees and state excise duty in case of Kerala. Tamil Nadu has scored lowest in collecting revenue from land and motor vehicle tax. Lowest score of the states indicate that actual revenue of those is less than taxable capacity. So, if the state governments want to develop they should make more efforts to collect revenue from their weak performing areas.

REFERENCES

- [1] ACIR, "Measure of state and local fiscal capacity and tax effort," Report No. M-16, 1962. Retrieved from: <http://www.library.unt.edu/gpo/acir/Reports/information/M-16.pdf>.
- [2] H. Aaron, "Some criticism of tax burden in India," *National Tax Journal*, vol. 18, no. 3, pp. 313-318, 1965.
- [3] R. W. Bahl, "A representative tax system approach to measuring tax effort in developing countries," *International Monetary Funds*, vol. 19, no. 1, pp. 87-124, 1972.
- [4] R. Bird, "A note on tax sacrifice comparison," *National Tax Journal*, vol. 17, no. 3, pp. 303-308, 1964.
- [5] D. N. Dwivedi, "Trends in tax effort of Indian states," mimeo, unpublished *Economic Survey* 2017, "Ministry of finance," 1980. Retrieved from <http://indiabudget.nic.in/es2016-17/echapter.pdf>
- [6] H. J. Frank, "Measuring state tax burdens," *National Tax Journal*, vol. 12, no. 2, pp. 179-185, 1959.
- [7] S. Garg, A. Goyal, and R. Pal, "Why tax effort falls short of capacity in Indian states: A stochastic frontier approach," Indira Gandhi Institute of Development Research, Working Paper No. 2014-032, pp. 1-48, 2014. Retrieved from: <http://www.igidr.ac.in/pdf/publication/WP-2014-032.pdf>
- [8] IMF, "Revenue mobilization in developing countries," *International Monetary Fund*, 2011.
- [9] T. M. Le, B. M. Dodson, and J. Rojchaichaninthon, "Expanding taxable capacity and reaching revenue potential: Cross – country analysis," World Bank, Policy Research Working Paper No. 4559, 2008. Retrieved from: https://www.researchgate.net/profile/Blanca_MorenoDodson/publication/2560
- [10] S. Mahdavi, "State government tax revenue, tax revenue composition and tax effort index: An Assessment of the 1978-1997 period," Working Paper, The University of Texas at San Antonio, 2013. Retrieved from: <http://business.utsa.edu/wps/eco/0036ECO-090-2013.pdf>
- [11] The Ninth Finance Commission, 1989. Report Retrieved from http://www.nipfp.org.in/media/pdf/books/BK_35/The%20Ninth%20Finance%20Commission%20Issues%20And%20Recommendations.pdf
- [12] M. A. Oommen, "Relative tax effort of states," *Economic and Political Weekly*, vol. 22, no. 11, pp. 466-470, 1987.
- [13] M. Piancastelli, "Measuring the tax effort of developed and developing countries: Cross country panel data analysis-1985/95," IPEA, Working Paper No. 818, 2001. Retrieved from: <http://dx.doi.org/10.2139/ssrn.283758>
- [14] M. C. Purohit, "Tax efforts and taxable capacity of central and state governments," *Economic and Political Weekly*, vol. 41, no. 8, pp. 747-751, 2006.
- [15] H. Rao, "Taxable capacity tax-efforts and forecasts of tax-yield of Indian states," Institute for Social and Economic Change, Bangalore, India, 1993. Retrieved from: http://203.200.22.249:8080/jspui/bitstream/2014/9760/1/Taxable_capacityfor_tax_efforts_and_forecast_Content.pdf.
- [16] M. G. Rao, "The Tyranny of the status quo: The challenge of reforming India's tax system," India Policy Forum, 2015. Retrieved from <http://www.ncaer.org/uploads/photo-gallery/files/1436711357IPF%202015%20Govinda%20Rao%20Conference%20Version%20Draft.pdf>
- [17] S. Raju, "State fiscal capacity and tax effort: Evidence from Indian states," University of Mumbai, Working Paper No. UDE 39/2/2012, pp. 1-18, 2012. Retrieved from http://archive.mu.ac.in/arts/social_science/eco/pdfs/depart/SR-WP-39-02-2012.pdf
- [18] T. Sen, "Relative tax effort by Indian states," National Institute of Public Finance and Policy, Working Paper No. 5, 1997. Retrieved from: http://www.nipfp.org.in/media/medialibrary/2013/04/wp_1997_05.pdf
- [19] K. V. S. Sastri, *Federal State Financial Relations in India*, New-Delhi: Oxford Press, 1966.
- [20] J. V. M. Sarma, "Panel data models and measurement of states tax effort in India," *Journal of Quantitative Economics*, vol. 7, no. 1, pp. 145-164, 1991.
- [21] G. Timmaiah, *Revenue Potential and Revenue Efforts of Southern States*, New Delhi: Oxford and IBH Publishing Company, 1979.