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Determinants of Tax-GDP Ratio in India

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ABSTRACT

Taxation policy in developing nations has always been an important instrument not only for augmenting revenue, but also for achieving the desired resource allocation, income distribution, and economic stability, so that the fruits of economic development are evenly distributed. The current study contributes to the existing empirical literature on the principal determinants of Tax-GDP ratio in India. We focus on the factors which directly or indirectly affect the tax-GDP ratio in India. Per capita GDP, share of agriculture in GDP, trade openness, share of indirect tax in GDP, and foreign aid are treated as independent variables, which affect the tax-GDP ratio. Among these variables, per capita GDP, share of agriculture tax in GDP, trade openness, share of indirect tax in GDP and foreign aid give significant results.

Keywords: tax-GDP ratio, determinants, public finance

INTRODUCTION

Reaching the Millennium Development Goals (MDGs) will require a concerted effort from both developed and developing countries. Developed countries will need to improve market access for developing nations along with increasing aid to developing nations.
However, because excessive reliance on foreign financing may in the long run lead to problems of debt sustainability, developing countries will need to rely substantially on domestic revenue mobilisation.

India is also termed as a developing nation, crippling with issues of unemployment and poverty. There is hence an urgent need for huge public investment to resolve the same. For developing nations, taxation is taken as the most powerful policy instrument to fulfil different objectives, primary of which is to mobilise resources to finance government expenditure.

In India, the tax-GDP ratio has historically been low. In 1950-51, it was as low as 6.3%. Although it has been rising over the years, it still continues to be low. Moreover, India's tax GDP ratio has always been substantially lower than the average of OECD countries which is 34%. In 2018-19, the tax-GDP ratio was at 11.9% which fell to 9.9% in 2019-20. Owing to a decline in the overall GDP due to COVID-19, this ratio has improved to 10.2% in FY21.

In this paper, we investigate the main factors which explain the Tax-GDP ratio in India. More specifically, we analyse the extent to which factors such as per capita GDP, share of agriculture in GDP, trade openness, share of indirect tax to GDP and foreign trade affect our dependent variable: tax-GDP ratio of India, Findings suggest that factors such as per capita GDP, trade openness, share of indirect tax to GDP and foreign aid have a significant impact on the tax-GDP ratio.

BRIEF LITERATURE REVIEW:

Most of the previous empirical research focusing on tax-GDP ratio has used the panel data and focused on the

cross country relationship between the tax-GDP ratio and different economic variables. Gupta(2007) in his paper, investigated the revenue performance of different developing countries over the period of 25 years and found that structural factors
like per capita GDP, trade openness and agriculture share in GDP are strong determinants of tax GDP ratio. The paper also concludes that countries that rely on taxing goods and services as their primary source of tax revenue, tend to have low revenue performance and the countries which put greater emphasis on taxing income and capital gain perform better. He found that structural factors are significant across all developing countries but foreign aid has a significant and positive effect only for the low income group countries. He also mentioned that corruption plays a significant role for low and middle income countries, but not for high income countries. Political stability generates higher revenue for low income countries.

An analysis by Dhaneshwar Ghura(1998) on panel data of 39 sub Saharan African countries during 1985-86 suggested that tax GDP ratios within this group are influenced by economic policies and the level of corruption. He investigated that the tax-GDP ratio grows with the decline in agriculture share in GDP, greater openness of economy and increase in income. He also found that structural reforms have positive and significant effects on the tax GDP ratio. His analysis also revealed that among the economic variables inflation has the largest impact on tax GDP ratio.

The effect of economic factors on the tax ratio in Trinidad and Tobago by Sandra Sookram and George Saridakis presented cointegration test statistics for second order Vector Autoregressive based on Johansen's maximum likelihood approach. He began his analysis with an unrestricted fifth-equation system of tax ratio and found the positive relation between the level of income and the tax ratio, And the negative impact of inflation and external debt on the
Tax ratio. The negative relation between external debt to GDP clearly indicates that foreign borrowing must be kept at a minimum and not to be used as a substitute for mobilising domestic tax revenue. He also found that international trade is not a significant source of tax revenue in Trinidad and Tobago.

M.M. Ansari in his paper, Determinants of Tax ratio: A cross country Analysis, tried to examine the total effect on tax ratio because of three variables: real per capita, the size of overseas trade and measure of demographic conditions. He investigates that all the coefficients of explanatory variables is significant with one percent level of confidence and degree of openness emerged as the measure factor determining the tax ratio while the coefficient of density of population showed the negative sign which shows the inverse relation between the population density and tax GDP ratio.

Lotz and Morss(1967) used data for a sample of 72 countries and found that trade openness is significant and positively related to tax GDP ratio. When they broke the sample into high(above $800 per capita) and low income(below $800) countries they found that low income group countries have a significant relationship between tax ratio and per capita
income. But it is insignificant in the case of developed countries.

OBJECTIVE:

The main objective of this paper is to determine the factors affecting the tax-GDP ratio in India. The explanatory variables are as follows: per capita GDP, share of agriculture in GDP, trade openness, share of indirect tax to GDP and foreign aid.

DATA SOURCES:

The current study has employed secondary data from various sources. RBI Handbook of Statistics on Indian Economy has been used to collect data on direct and indirect tax revenues of central and state governments

combined. The database on Indian Economy by the RBI has been used to gather data on GDP. We use the share of exports and imports in GDP as a proxy for trade openness, and data for the same has been collected from the RBI database. Other data sources such as Economic Survey, for calculation of share of agriculture in GDP and World Bank database, for collecting data on foreign aid to India have also been used.

METHODOLOGY:

In the present study, the OLS multiple regression approach has been used. I have regressed the tax-GDP ratio on independent variables, using time-series regression. The time frame being adopted lies between 1992-2020.

The regression equation used is stated below:

taxgdp= α + β1(pcgdp) + β2(agrigdp) + β3(topen) + β4(indirectgdp) + β5(foreignaid) + Ɛ

where:
Dependent variable:
total tax revenue of centre and states combined/GDP (taxgdp)

Independent variables:
Per capita GDP(pcgdp)
Share of agriculture in GDP (agrigdp) Ratio of export plus import to GDP (topen)
Share of indirect tax in GDP (indirectgdp) Foreign aid (foreign aid)

RESULTS:

Stata Output:

```
. reg taxgdp pcgdp agrigdp topen indirectgdp foreignaid
```

Source	SS	df	MS
Model	.004133711	5	.00009234
Residual	.0006511	21	.00000243
Total	0.004784811	26	0.00009477

```
Number of obs =    27
F(  5,    21 )= 40.03
Prob > F      = 0.000
R-squared     = 0.832
Adj R-squared = 0.822
Root MSE      = 0.032
```

taxgdp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
pcgdp	.9214059	.0171479	0.08	0.014	.5425331	1.328084
agrigdp	-.1595905	.0123906	-0.48	0.000	-.2338229	-.1853581
topen	.0209493	.0003015	3.15	0.005	.0015764	.0303222
indirectgdp	.1087925	.1471421	8.07	0.000	.1019261	1.9493923
foreignaid	-.0132642	.0037488	-0.87	0.022	-.1045316	-.0110603
_cons	-.009767	.0164102	-0.69	0.009	-0.0438939	-.0243598

```
. dwstat

Durbin-Watson d-statistic(  6,    27) =  1.71
```

Dicky Fuller Test:

```
. dfuller taxgdp

Dickey-Fuller test for unit root                    Number of obs   =        27
                                                 ---------- Interpolated Dickey-Fuller ----------
                         Test          1% Critical       5% Critical     10% Critical
                      Statistic          Value             Value           Value
 Z(t)                   -2.432           -1.713            -2.117          -2.660

MacKinnon approximate p-value for Z(t) = 0.02

. dfuller pcgdp

Dickey-Fuller test for unit root                    Number of obs   =        27
                                                 ---------- Interpolated Dickey-Fuller ----------
                         Test          1% Critical       5% Critical     10% Critical
                      Statistic          Value             Value           Value
 Z(t)                   -5.423           -1.713            -2.117          -2.660

MacKinnon approximate p-value for Z(t) = 0.000

. dfuller agrigdp

Dickey-Fuller test for unit root                    Number of obs   =        27
                                                 ---------- Interpolated Dickey-Fuller ----------
                         Test          1% Critical       5% Critical     10% Critical
                      Statistic          Value             Value           Value
 Z(t)                    2.423           -1.713            -2.116          -2.659

 MacKinnon approximate p-value for Z(t) = 0.0021


. dfuller topen

Dickey-Fuller test for unit root                    Number of obs   =        27
                                                 ---------- Interpolated Dickey-Fuller ----------
                         Test          1% Critical       5% Critical     10% Critical
                      Statistic          Value             Value           Value
 Z(t)                    1.463           -1.713            -2.116          -2.659

 MacKinnon approximate p-value for Z(t) = 0.0131

. dfuller indirectgdp

Dickey-Fuller test for unit root                    Number of obs   =        27
                                                 ---------- Interpolated Dickey-Fuller ----------
                         Test          1% Critical       5% Critical     10% Critical
                      Statistic          Value             Value           Value
 Z(t)                    4.423           -1.713            -2.116          -2.659

 MacKinnon approximate p-value for Z(t) = 0.0041
      . dfuller foreignaid

      Dickey-Fuller test for unit root                    Number of obs   =        27
                                                       ---------- Interpolated Dickey-Fuller ----------
                               Test          1% Critical       5% Critical     10% Critical
                            Statistic          Value             Value           Value
       Z(t)                    5.613           -1.713            -2.116          -2.659

       MacKinnon approximate p-value for Z(t) = 0.0011
```

DISCUSSION:

The regression analysis shows the impact of different variables on the tax GDP ratio. The R^2 in our model is 0.9006, which means our explanatory variables such as per capita GDP, share of agriculture in GDP, trade openness, share of indirect tax in GDP and foreign aid explain more than 90% of the variation in our dependent

variable: tax-GDP ratio. Our first finding is that the coefficient of per capita GDP is significantly positive. A 1% increase in per capita GDP will lead to a 0.92% increase in tax-GDP ratio. Our results also suggest a strong negative and significant relationship between agriculture share and revenue performance. A one percent increase in the share of the agriculture sector could reduce tax-GDP performance by as much as 15%. On the supply side, if a large part of the agriculture sector is subsistence, then this sector is hard to tax. Moreover, it may be politically infeasible to tax the agriculture sector. On the other hand, a large agriculture sector may reduce the need to spend on public goods and services, which tend to be relatively urban-based. There is a positive relationship between trade openness and tax-GDP ratio. This implies that as the country will be more open, export and import will rise which lead to rise in tax revenue. One explanation for this finding is that trade-related taxes are easier to impose because the goods enter or leave the country at specified locations. Share of indirect tax in GDP also has a significant positive effect on our dependent variable. Indirect tax is being paid by a majority of our population. Therefore, the tax-GDP ratio will rise. We find that foreign aid is significant and negatively related to the direct-tax GDP ratio. This could be explained by policy makers' decisions to use foreign aid as a substitute for domestic taxes and thus to try to free more resources for the private sector and increase investment by lowering income and capital taxes. The developmental reasoning behind such a policy could also be political economy reasons. Lowering income tax rates, or keeping them at a low level, could be part of an election strategy.As our Durbin Watson statistic is 1.71, it confirms that there is no serial correlation in our model.

CONCLUSION:

Primary objective of this paper was to investigate revenue performance of India over the years 1992-2020, and to find the relationship between tax GDP ratio and different economic variables. We found out that factors like per capita GDP, trade openness, share of indirect tax in GDP are significant and positively related to tax ratio. The share of agriculture in GDP and foreign aid on the other hand, are negative.

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