TAX BUOYANCY OF INDIA: AN EMPIRICAL ANALYSIS

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Abstract

The objective of the paper is to examine the tax buoyancy in India during the period 1950-2010. This total period is divided into five decades and observed tax buoyancy in each decade. The log-linear regression technique is used to estimate the tax buoyancy. The important implication of the positive regression coefficient is that the instantaneous growth of tax revenue is more than that of national income. From the regression analysis it is found that during all the five decades the tax buoyancy is higher than national income. But the tax buoyancy is very high in 1970s and 1960s. From 1980s to 2000s the tax buoyancy is almost constant. The decade-wise change in tax revenue due to one per cent increase in GDP is examined through change in regression coefficient of each decade. Here, the noteworthy point is that from 1950s to 1960s the tax revenue increased by 1.7 per cent and from 1960s to 1970s the increase in tax revenue is only 0.6 percentage. From 1970s to 1980s the increase in tax revenue drastically declined by 2.2 percentage. From there onwards the change in tax revenue noticed a declining trend but the percentage of declining is not too high.

Key Words: Tax Buoyancy, Regression, GDP

Introduction

In the modern era the role of government is not confined only to provide basic amenities to people. For the developing countries particularly in the case of India, on the one hand it is having demographic dividend and on another side still mass poverty, unemployment is posing a challenge. Since independence India is implementing so many development programmes to meet the ever growing challenges it has been confronting. For this, the government needed more public revenue in order to invest in social and overhead capital which is crucial for the development of an economy.
as they are having more linkages with the other sectors of the economy. Only government has to invest in such activities as they are having long gestation periods. This requires huge amount of investment and for the government the important source to generate income is tax revenue. But in India the tax revenue is not adequate as some of the economic activities such as agricultural income is an exception till today in rural areas and the rising unorganised sector is not fully comes under the tax purview in urban areas. According to the Economic Survey 2014-15, in the immediate post-Fiscal Reforms and Budget Management Act 2003 (FRBMA) period (2004-05 to 2007-08) significant fiscal consolidation was achieved largely due to growth in tax revenues. Post-2008 crisis, growth in overall gross tax revenue (GTR) as well as its major components (with the exception of personal income tax) was not buoyant enough to facilitate encore performance in terms of revenue-led fiscal consolidation (Economic Survey, 2014-15). In this background this paper focused on examining the tax buoyancy of India during the period 1950-2010. The paper is organised in different sections. Section-II deals with the review of literature on tax buoyancy. In Section-III objective, data sources and methodology are discussed. In Section-IV results are presented and the final Section is devoted to conclusion followed by references.

Section-II: Review of Literature

Bilquees (2004) examined the elasticity and buoyancy of the tax system for the period 1974-75 to 2003-04. The elasticity of the total tax revenue both with respect to the total GDP and the non-agricultural GDP base is less than unity. Overall, sales tax takes the lead by way of improving revenues. The high coefficient of income tax inclusive of withholding tax, which is an indirect tax, is high. Excluding the withholding tax leads to a lower coefficient. Sales tax with respect to imports and manufacturing also takes care of loss of revenue due to lowering of tariff and excise duties. However, the sales tax coefficient with respect to the GDP base reflects the inclusion of

service sector and utilities in the sales tax net, which has serious implications for the poor. The estimates of buoyancy suggested that tax changes did not lead to significant revenue augmentation. The low buoyancy of income tax exclusive of the withholding taxes implies that imposition of massive withholding taxes coupled with an increase in the taxable income limits is working at cross purposes.

Upender (2008) made an attempt to provide an empirical content to differential coefficient of tax [revenue] buoyancy during post tax reform period in India. The period after 1992 is considered as post tax reform period to look at the prognostications of tax reforms that had been initiated by the government of India. The regression results illustrate that the estimate of constant gross tax buoyancy is positively significant and more than unity during pre tax reform period illuminating that gross tax is moderately elastic. From this upshot it can be comprehended that a one per cent increase in income leads to increase the gross tax revenue by more than one per cent, all else equal. Further it can be understood that the average propensity to tax was increasing with the increase in Gross Domestic Product during pre tax reform period. The regression coefficient of interaction variable is significantly negative and stumpy showing a downward shift in the degree of tax buoyancy during post tax reform period. The estimate of the tax buoyancy which was just above the unity during pre tax reform period is less than unity during post tax reform period evincing the fact that the gross tax is relatively inelastic. From this it can also be understood that the average propensity to tax is declining with the increase in Gross Domestic Product during post tax reform period. Thus, the estimates of gross tax buoyancy during pre and post-tax reform periods are not stable. Ahmed and Mohammed (2010) found the determinant of tax buoyancy of developing countries. The authors used 25 countries cross section data for the year 1998 to 2008 and used

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pooled least square method for result analysis. Their result showed that import, manufacturing sector, services sector, monetization and budget deficit influence positively the tax buoyancy while growth in grants impact negatively on tax buoyancy. The growth of agriculture sector has insignificant impact on tax buoyancy in case of developing countries because they are not taxed or under taxed.

Okech and Mburu (2011)\textsuperscript{5} analyzed the responsiveness of tax revenue to changes in national income using tax elasticity and buoyancy given the various tax reform measures that have been mooted over years. The authors found that the tax revenue was neither buoyant nor income-elastic despite reforms undertaken over period since 1986. On the basis of this, the authors recommended that there is a need to re-evaluate the tax policy measures that have been implemented over the years to make tax responsive to national income while enhancing tax collection measures.

Kargbo and Egwaikhide (2012)\textsuperscript{6} examined the base elasticity of the tax system in Sierra Leone and its major handles using annual data covering the period between 1977 and 2009. The empirical results by the authors indicated that buoyancy estimates were higher than elasticity estimates; and that short-run elasticities were lower than the static long-run elasticities. Estimation results further showed that discretionary tax measures were effective in mobilizing additional tax revenues and that the tax system was inelastic during the period.

Ndedzu et. al (2013)\textsuperscript{7} evaluated the revenue productivity of Zimbabwe’s overall tax system and of individual taxes on the basis of estimates of tax buoyancy using yearly time series data for the period 1975-2008. The tax buoyancy is computed using the Dummy Variable Technique to abstract


\textsuperscript{7}Desmond Ndedzu et. al (2013): “Revenue Productivity of Zimbabwe’s Tax System”, \textit{Asian Journal of Social Sciences & Humanities}, 2 (4), 144-156.
from discretionary changes in the tax system. The estimation results of the authors demonstrated that the tax system as a whole and the individual taxes, with the exception of customs duty, are both not buoyant. Also most of the buoyancy coefficients are found to be greater than the elasticity coefficients implying that discretionary tax measures were used to generate additional tax revenue during the study period. The authors recommended improvements on tax administration, reduction in tax evasion and reducing the number of tax exemptions so as to improve on revenue generation.

Belinga et. al (2014) estimated short- and long-run tax buoyancy in OECD countries between 1965 and 2012. The authors found that for aggregate tax revenues, short-run tax buoyancy does not significantly differ from one in the majority of countries; yet, it has increased since the late 1980s so that tax systems have generally become better automatic stabilizers. Long-run buoyancy exceeds one in about half of the OECD countries, implying that GDP growth has helped improve structural fiscal deficit ratios. Corporate taxes are by far the most buoyant, while excises and property taxes are the least buoyant. For personal income taxes and social contributions, short and long-run buoyancies have declined since the late 1980s and have, on average, become lower than one.

Bayu (2015) found that the share of service sector value added, import and overall government budget deficits to GDP affects gross tax revenue positively, whereas the share of official development assistance to GDP affects it negatively. Even though the share of industry value added to GDP has positive effect on the buoyancy of gross tax revenue, statistically it was found insignificant. Further, the author revealed that tax revenues are non-buoyant in Ethiopia this points the need for enhancing the efficiency of revenue administration in bringing new customers in to the tax net.

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Section-III: Objective

The objective of the paper is to examine the tax buoyancy in India during the period 1950-2010. This total period is divided into five decades and observed tax buoyancy in each decade.

Data Sources and Methodology

The data on Gross Domestic Product (GDP) at market prices is obtained from RBI website on Data Base on Indian Economy and the data on Total Tax Revenue is collected from Indian Public Finance Statistics -2014-15 published by the Ministry of Finance, Govt. of India for the period 1950-2010.

In the empirical studies tax buoyancy will estimated using the following power function.

\[ Y = b_0 X^{b_1} \]

For the purpose of estimating the above regression equation by OLS method, the two variables have to be specified in log form as shown below.

\[ \log Y = \log b_0 + b_1 \log X \]

The derivative of log Y with respect to log X is \( b_1 \) the constant tax buoyancy. In the empirical studies, this form of equation is being widely used to estimate the degree of tax buoyancy on the grounds that the regression coefficient of log X (income) gives directly the size of tax buoyancy. If the degree of tax buoyancy is more than unity, then the instantaneous growth rate of tax revenue will be relatively higher than that of instantaneous growth rate of national income. If the degree of tax buoyancy is less than unity, then the instantaneous growth rate of tax revenue will be relatively smaller than that of instantaneous growth rate of national income. If the degree of tax buoyancy is unity, then the instantaneous growth rate of tax revenue and national income will be identical. Thus, the log-linear form of regression equation of tax revenue on income will be helpful in ascertaining the size of the instantaneous growth rates of tax revenue and national income. It
should be noted that the estimate of tax buoyancy through the log-linear equation would be constant. (Upender, 2003)\textsuperscript{10}

**Section-IV: Results**

The result of estimated log-linear regression is presented in Table-1. During the decade of 1950s, the coefficient of GDP is positive and significant at one per cent level. In this decade increase in percentage of GDP leads to increase in tax revenue by 1.7 per cent. The model explains 83 per cent of variation in tax revenue due to one percentage increase in GDP. In 1960s also the sign of the regression coefficient is positive and significant at one per cent level. In this decade the value of the regression coefficient is reported as 3.4 which means that the increase in tax revenue due to one per cent increase in GDP is double when compared with the previous decade. The model explains 92.6 per cent changes in tax revenue caused by one per cent increase in GDP. During 1970s also there is an increasing trend in tax revenue as shown by the regression coefficient as it is positive and significant at one per cent level. The value of the regression coefficient is 4.0 which show that in the 1970s tax revenue increased by 4 per cent due to one per cent increase in GDP. The variation in tax revenue is explained 88.7 per cent by the model. 1980s decade also witnessed a positive sign of the regression coefficient and significant at one per cent level. In this decade one per cent increase in GDP leads to 2.8 per cent increase in tax revenue. The model explains 99.3 per cent of variation in tax revenue caused by one per cent increase in GDP. In 1990s, the regression coefficient is turned out to be positive and significant at one per cent level. Due to one per cent increase in GDP this decade witnessed 2.1 per cent increase in tax revenue. The model explains 98.2 percentage of variation in tax revenue caused by one per cent increase in GDP. During 2000s also the regression coefficient is turned out to be positive and significant at one per cent level. One per cent increase in

GDP leads to increase in tax revenue by 2.0 per cent as reflected by the regression coefficient. The model explains 99.3 per cent of variation in tax revenue caused by one per cent increase in GDP.

The decade-wise change in tax revenue due to one per cent increase in GDP is examined through change in regression coefficient of each decade. Here, the noteworthy point is that from 1950s to 1960s the tax revenue increased by 1.7 per cent and from 1960s to 1970s the increase in tax revenue is only 0.6 percentage. From 1970s to 1980s the increase in tax revenue drastically declined by 2.2 percentage. From there onwards the change in tax revenue noticed a declining trend but the percentage of declining is not too high.

One more important implication of the positive regression coefficient is that the instantaneous growth of tax revenue is more than that of national income. From the regression analysis it is found that during all the five decades the tax buoyancy is higher than national income. But the tax buoyancy is very high in 1970s and 1960s. From 1980s to 2000s the tax buoyancy is almost constant.

<table>
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<th>YEAR</th>
<th>α</th>
<th>t (α)</th>
<th>p</th>
<th>β</th>
<th>t (β)</th>
<th>p</th>
<th>R²</th>
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<td>1950s</td>
<td>-7.720</td>
<td>-3.336</td>
<td>.010</td>
<td>1.770</td>
<td>6.239</td>
<td>.000</td>
<td>.830</td>
</tr>
<tr>
<td>1970s</td>
<td>-26.407</td>
<td>-5.897</td>
<td>.000</td>
<td>4.001</td>
<td>7.942</td>
<td>.000</td>
<td>.887</td>
</tr>
<tr>
<td>1980s</td>
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<td>-20.116</td>
<td>.000</td>
<td>2.829</td>
<td>33.663</td>
<td>.000</td>
<td>.993</td>
</tr>
<tr>
<td>1990s</td>
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<td>-9.148</td>
<td>.000</td>
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<tr>
<td>2000s</td>
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<td>-13.011</td>
<td>.000</td>
<td>2.031</td>
<td>34.507</td>
<td>.000</td>
<td>.993</td>
</tr>
</tbody>
</table>

Note: *indicates significant at 1 per cent level. 
Source: Author’s calculation.
Section-V: Conclusion

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