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Impact of Debt on Primary Deficit and GSDP Gap in Odisha: Empirical Evidences

1. Introduction

The excessive pressure of public expenditure over its revenue receipt is financed through borrowing and this accumulation of borrowing leads to both financial and real burden on the people. It is because that the present borrowing is financed through future tax hence is called financial burden to the people. Further, it is also observed that the increasing level of taxable income may cause adverse effects on the willingness to work and save. This type of effect is called the real burden of the public debt.

Although there is revenue surplus of Rs. 27.96 crore in the FY 1981-81 (Finance Account, Govt. of Odisha), the State's revenue position started deteriorating incurring revenue deficits continuously. This widening level of revenue deficit combined with high level of fiscal deficit forced the Govt. of Odisha to go for internal debt.

2. Objectives

The objectives of this study is to examine

2.1 The solvency aspect debt of Odisha by capturing the primary deficit

2.2 The impact of debt on GSDP gap. GSDP gap is the difference between potential GSDP and actual GSDP.

3. Selected Literatures

The literature in the context of public debt has been carried out in the case of India by authors such as Venkataraman (1968), Singh (1999), Rangarajan and Srivastav (2005), Kanan and Singh (2007), and Bal and Rath (2014) shows public debt has negatively affects the economic growth

in the long run. So far, no study on this aspect is made on Odisha. This motivate us to makes an attempt to examine the impact of debt specific to Odisha by taking Bohn (1998) framework.

4. Analytical Framework and Data Sources

Bohn (1998) framework suggests that the primary surplus generated on account of public debt is a sufficient condition for solvency. This study has extended the Bohn framework by including GSDP gap. The potential GSDP is calculated through Hodrick-Prescott (HP) filter. Since there is inter-relationship among debt (DB), primary deficit (PD) and GSDP gap (OG), Structural VAR (SVAR) is used for our analysis. Our model is as follows:

$$\begin{bmatrix} \Delta DB_t \\ \Delta PD_t \\ \Delta OG_t \end{bmatrix} = \begin{bmatrix} 1 & b_{PD_t}^{DB_t} & b_{OG_t}^{DB_t} \\ 0 & 1 & b_{og_t}^{PD_t} \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} \mu_{DB_t} \\ \mu_{PD_t} \\ \mu_{OG_t} \end{bmatrix} \qquad (1)$$

Where, μ_{DB_t} μ_{PD_t} and μ_{OG_t} are the structural impacts of public debt, primary deficit and GSDP gap respectively. The 3×3 coefficient matrix shows the structural impacts of the restricted variables. All the data are taken in real terms. **The methodology is explained in the annex**.

5. Results & Analysis

The first step is to know the stationary or non-stationary property of the variables to avoid the spurious regression in time series. Hence, ADF and PP test are conducted and the results show that all the series are stationary at first order difference. In the subsequent step, the optimum lag selection criteria are implemented through VAR model by following AIC, SC and HQ criteria. These criteria suggested that lag 2 is the optimum and VAR follows the stability condition. It indicates that there are no roots of the polynomial outside of the unit circle and hence can be concluded that VAR satisfy the stability condition in the model. In the next step, this study illustrated the dynamic relation among these variables in a structural VAR with long run restriction framework, and the results are presented in Table 1.

Table 1: Structural VAR Parameter Estimates

Parameter	Coefficient	Std. Error	P-Value
$b_{PD_t}^{DB_t}$	1.71***	0.17	0.00
$b_{OG_t}^{DB_t}$	-2.79***	0.35	0.00
$b_{OG_t}^{PD_t}$	-0.04	0.17	0.81

Note: *** indicates significant at 1 percent level; DB = public debt; PD = primary deficit; OG = GSDP gap.

5.1 The results from Table 1 show that the impact of public debt on primary deficit is significant and positive. It indicates that higher public debt leads to higher primary deficit**. 1% rise of debt ratio leads to 1.71% rise in the primary deficit ratio.** This implies that there were insolvency issues during the period of FY 1980-81 to FY 2014.15.

5.2 The results from Table 1 also indicates that the impact of public debt on GSDP gap is negative and statistical significant. **This implies that debt has a positive impact on GSDP by reducing the gap between potential and actual GSDP**. More specifically, **1% rise in debt ratio reduces the GSDP gap by 2.79 %.**

5.3 No conclusive results are found relating to the impact of primary deficit on GSDP gap.

5.4 In the next step, this study captures long term relationship among these variables through impulse response function (figure 1 and 2). **The future 10 year time period is taken into account to examine the relationship.**

Fig. 1: Response of Primary Deficit due to Shock of Debt

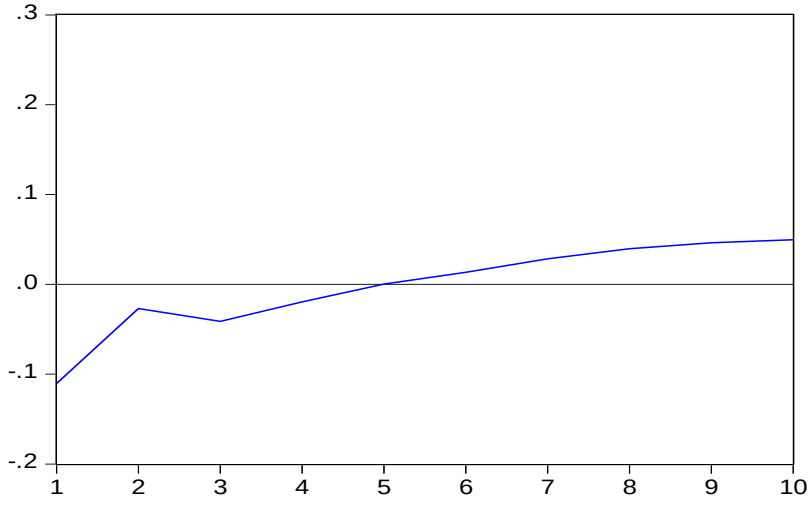
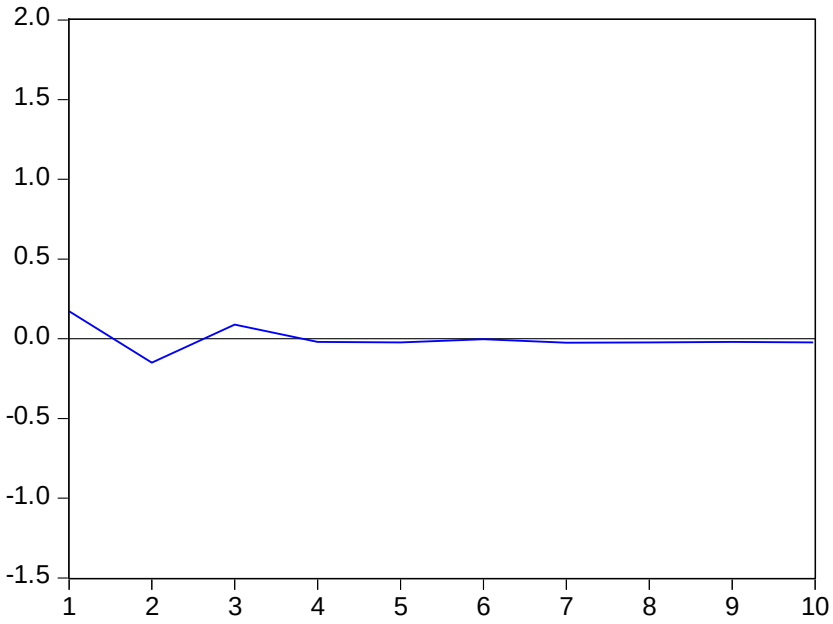


Fig.2: Response of GSDP gap due to Shock of Debt



5.4.1 The figure 1 shows the response of primary deficit ratio on account of change in one standard deviation in debt ratio. It will be negative for coming five years **but it will have positive effect (it will be primary surplus) in the next 6 to 10 years.**

5.4.2 The response of GSDP gap (figure 2) to one standard deviation change in debt ratio indicates the gap would come down in the beginning of the period and it will have a neutralized effect in subsequent years.

6. Policy Implications

This study suggests an incremental rise in debt ratio for reducing the GSDP gap and improving the primary deficit ratio. The decline in GSDP gap will be achieved through higher economic growth and, generate more revenue for the State, which in turn, will improve the primary deficit.

References

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Annex

Methodology

The study use structural vector auto regression (SVAR) model by putting long run restriction because reduced VAR model does not allow us to estimate the impact of public debt on primary deficit as well as GSDP gap.

So, the VAR model is in present context appears as follows:

$$y_t = \eta + \sum_{j=1}^{k} \beta_j x_{t-j} + u_t \qquad (2)$$

Where, $y_t = [DB_t , PD_t, OG_t ,]^{/}$, η is a vector associated with constant term, and β_j is a matrix of VAR parameters for lag j, x_{t-j} is the 3×3 matrix of the variables and u_t is white noise disturbance term. In the case of reduced VAR model the impact of one variable consequently affect to all other variables and hence it's difficult to assess the impact of a particular variable on other variable. Therefore the study takes SVAR model to show the impact of public debt (DB_t) on primary deficit (PD_t) and GSDP gap (OG_t) by taking annual data from FY 1980-81 to FY 2014-15 (in real terms). The main purpose of SVAR estimation is to obtain non-recursive orthogolization of the error terms for impulse response analysis. To identify the long-run structural impact, we chose the identification of Blanchard and Quah (1989) long-run constraints[1].

[1] This kind of restriction is applied only in the case of integrated variable.