



PUBLIC DEBT AND ITS PRODUCTIVITY : A MODEL BASED TEST AND ANALYSIS IN JHARKHAND

Diraj Mani Pathak

Dept. of Economics, St. Xavier College, Ranchi

Like other Indian states, Jharkhand is also relying on debt financed revenues to increase the pace of Economic Growth. The positive effects of Public Debt relate to the fact that in resource-lacking economies, debt financing, if done properly yields higher growth and adds to their capacity to service and repay debt but the negative effects work through Debt Burden and Resource Diversion from Developmental Activities to Debt Servicing or Non-Developmental Activities. Hence, for a new as well as an underdeveloped state like Jharkhand must pay utmost care to the utilization of public debt. The present study examines the impact of public debt on economic growth of Jharkhand for the period 2000-01 to 2013-14. Ordinary Least Square (OLS) method has been used for model fitting. The study confirms a strong positive relationship between Outstanding Debt and GSDP of the state. However, the relationship between GOI debt and SDP of the state has been found negative but it was not very strong.

Key Words: Economic Growth, GOI debt, GSDP, OLS.

Introduction

In general nobody would like to lend if they are not paid some returns on their funds. It simply means that anyone who borrows have a very strong belief that they would be able to generate sufficient returns by using borrowed funds, so that even after sharing it with the lenders they will end up with some surplus. This very fact states that by nature a debt is productive. But when we talk about the public debt the conditions changes and so does the nature of debt. Probably it was J.M.Keynes, who strongly suggested that the Government must intervene into the economic system for pushing out from depression. This intervention into the economic system is now not limited to depression only but is a general phenomenon. Modern states are welfare states and used to take care of its citizens from cradle to the grave. This has increased the revenue requirements of the Governments. At the same time Democracy and its current practices have forced the Governments to be a populist. And so, we observe, that the Governments are borrowing to finance productive as well as unproductive purposes. But as is known to all that even Governments have to repay the borrowed funds as well as the interest on that to remain solvent in the eyes of the public. So, it would be quite interesting to know as to what degree of productivity exists in case of Public Debt?

At the time of birth Jharkhand inherited a public debt of Rs. 5961.94 Crores (15/11/2000) from Bihar which has increased to Rs. 37593.84 Crores in 2013-14. So, the debt has increased by more than six times. The GSDP of Jharkhand in 2000-01 was Rs. 27616.38 Crores which has increased to Rs. 186219.75 Crores in 2013-14. So, it has also increased by more than six times. Thus, ordinarily speaking, the figures suggest that public debt has positive impact on economic growth of Jharkhand, but is this conclusion significant statistically? What are the implications of such a conclusion? Here, in this paper, an attempt has been made to answer these questions for Jharkhand.

Review of Literature

Many economists have attempted to study the effects of public debt on economic growth, theoretically whereas many have attempted to fit it empirically. So, the review of literature can be done by dividing it into two sections as follows:

Public Debt and Economic Growth: The Theory

The economists have had mixed opinions regarding the effects of public debt on economic growth. Accordingly there are many postulates. However, they can be grouped under two broad heads:

Public Debt has Negative Impact on Economic Growth

Neoclassical growth models augmented with public agents issuing debt to finance consumption or capital goods tend to establish a negative relationship between public debt and economic growth. Modigliani (1961), improving contributions by Buchanan (1958) and Meade (1958), argued that the national debt is a burden for future generations, which comes in the form of a reduced flow of income from a lower stock of private capital. He also pointed out that apart from a direct crowding-out effect, it has impact on long-term interest rates, possibly in a non-linear form.

Going into the details of this negative impact of public debt on economic growth, Diamond (1965) added the effect of taxes on the capital stock and differentiated between public external and internal debt. He concluded that, through the impact of taxes needed to finance the interest payments, both types of public debt reduce the available lifetime consumption of taxpayers, as well as their saving, and thus the capital stock. In addition, he contended that internal debt can produce a further reduction in the capital stock arising from the substitution of government debt for physical capital in individual portfolios.

Keeping in mind the long run nature of Economic Growth, Buchanan theory postulated that debt involves a postponement of the burden of taxation to future generations (future time-periods) (Geiger, 1990). And so, there can be no burden at the time when the expenditure is made because bond-purchasers act totally voluntarily but the burden must be borne in the future when coercive taxation is levied to service and redeem the debt. Internal debt and external debt are the same in this respect. Because future taxpayers are not around to defend their interests, public expenditure will be predictably higher under debt (Cohen, 1993). More generally, debt-financing is a violation of basic democratic principle – because it off-loads the cost of current expenditures onto the shoulders of a necessarily un-enfranchised future.

Public Debt has Positive Impact on Economic Growth

The Keynesian model postulates that there is no real burden associated with public debt and it has no negative effect on economic growth (Metwally and Tamaschke, 1994). The real burden occurs at the time when the expenditure is made: that's when real resources are used up. Internal public debt is "debt we owe to ourselves". It adds nothing to our real resource base.

Substituting public debt for current taxation has an immediate macro-expansionary effect: an increase in public expenditure financed by a tax increase invokes a different and lower multiplier than does debt-financed public expenditure (and indeed, in macro terms, public debt invokes no contractionary force (Savvides, 1992) . Elmendorf and Mankiw (1999) also has the similar view that in the short-run output is demand-determined and fiscal deficits (or higher public debts) have a positive effect on disposable income, aggregate demand, and overall output. This positive short-run effect of budget deficits (and higher debt) is likely to be large when the output is far from capacity.

Public Debt and Economic Growth: Empirical Studies

This area has been an area of common interest for the researches and hence we have plenty of empirical studies. These studies have attempted to connect Public Debt to Economic Growth. Many studies have found a negative relationship between the two whereas many have found a different one. However, all these studies have been focused on national level only.

Ali, R., & Mustafa, U. (2012) found that Debt burden has negative impact on economic growth and labor productivity in developing nations . A similar conclusion has been drawn by Karagol, E. (2012). According to him Debt services are negative related to GNP in long term and short term . Studying the impact of public debt on economic growth Singh, C. (1999), concluded that it is a perception that long term debt had negative impact on economic growth. But in the case of India domestic debt was used for investment purpose. The one aspect of debt is the burden for future generation . Assessing the impact of foreign debt on economic growth Lin, S., & Sosin, K. (2001), said that the utilization of foreign debt is very important. Foreign debt can be associated with positive economic growth but without proper utilization of foreign debt economic growth is not possible or can be unfavorable .

The relationship between public debt and its various components to economic growth is a complex one but most of the empirical studies have provided support to the theoretical logic that beyond a threshold level public debt has negative impact on economic growth.

Analytical Framework

Based on the general perception that if debt is used for productive activities and hence its impact must be reflected on GSDP of the state, the following regression models provides us the logical support. This type of regression models if fitted for a nation needs two independent variables viz. Domestic Debt and Foreign Debt. But in case of a sub-national entity or state there is no foreign debt. So, here, I will fit two models. First, considering only one independent variable viz. Total Outstanding Debt (OD) of the state and second, considering two independent variables viz. Total Internal Debt of the state (ID) and Loans and Advances from the Government of India (GOI). As we know that most of the Indian states are dependent on loans and advances from the government of India. So, it would be interesting to examine its impact on state's GSDP. Assuming normal distribution, the technique of Ordinary Least Square has been used for model fitting. Specifications of the models are as follows:

Model-I

$$\text{GSDP} = A + B(\text{OD}) + u$$

Where, 'GSDP' refers to Gross State Domestic Product and it is a dependent variable here, 'OD' refers to total Outstanding Debt of the State and it is an independent variable here, 'A' refers to the Constant intercept of the model, 'B' is the regression coefficient and 'u' stands for the residuals.

Model-II

$$\text{GSDP} = A + B_1(\text{ID}) + B_2(\text{GOI}) + u$$

Where, 'GSDP' refers to Gross State Domestic Product and it is a dependent variable here, 'ID' refers to Internal Debt, 'GOI' refers to loans and advances from the Government Of India or simply GOI debt of the State and both are an independent variable here, 'A' refers to the Constant intercept of the model, 'B1' and 'B2' are the regression coefficients and 'u' stands for the residuals.

Data Analysis

Here, the Debt figures and the GSDP figures both have been taken at current prices. Data tables are given in the Appendix below.

The estimated regression model-I is

$$\text{GSDP} = -14211.163 + 4.896(\text{OD})$$

Regression Analysis

Table-1: Regression Coefficients & Its Significance

Predictor	Coefficients	Std. Error	t	p
Constant	-14211.163	8237.228	-1.725	.112
OD	4.896	.346	14.133	.000
Dependent Variable: GSDP				

SE = 11951.98872, $R^2 = 94.78\%$, $R^2(\text{adj}) = 94.31\%$

In the above table predictor shows their impact on the dependent variable (GSDP). GSDP is impacted by the independent variable. Outstanding debt has positive and statistically significant influence on GSDP. Even if the sample size is not very big but the standard error of (B) is very small. Hence, estimates are very reliable. High value of R^2 and adjusted R^2 support the model.

ANOVA table also confirms the results of the first table. The high value of F-statistic and very low p-value again support the fitting of our regression model.

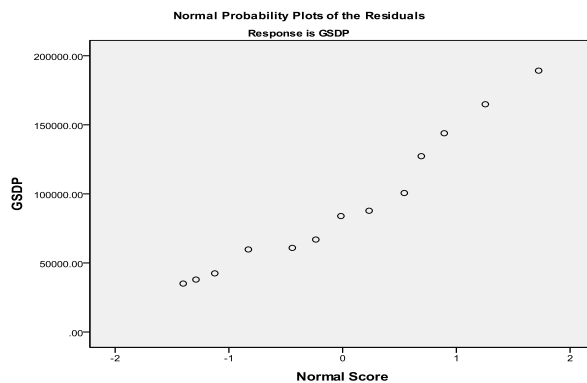
Table-2: Results of ANOVA

Sources	Sum of Squares	df	Mean Square	F	p
Regression	28532450490.670	1	28532450490.670	199.737	.000
Residual	1571350378.561	11	142850034.415		
Total	30103800869.231	12			
a. Predictors: (Constant), OD, b. Dependent Variable: GSDP					

Regression Graph

Probability plot of the residuals of the regression model seems to be normal (as it seems to be forming an approximate straight line) provide support for the fitted regression model and for our assumption of normal distribution.

Figure-1: Probability Plots of the Residuals



The estimated regression model-II is

$$\text{GSDP} = -28378.539642990247 + 7.308139675600492(\text{ID}) + -0.48791080562055084(\text{GOI})$$

Regression Analysis

Table-3: Regression Coefficients & Its Significance

Predictors	Coefficients	Std. Error	t	p
Constant	-28378.540	268954.433	-.106	.919
ID	7.308	5.214	1.402	.211
GOI	-.488	72.829	-.007	.995
Dependent Variable: GSDP				

SE = 13115.88782, $R^2 = 91.05\%$, $R^2(\text{adj}) = 88.06\%$

In the above table predictor shows their impact on the dependent variable (GSDP). GSDP is impacted by both of the independent variables. Internal debt variable has more impact

on the GSDP as compare to the GOI debt. Internal debt has positive and high statistically significant influence on GSDP while GOI debt decreases the GSDP as it has negative relation with GSDP but it is not highly significant as suggested by the t-value. Here, the standard errors are high but it may be due to a smaller sample size. High value of R² and adjusted R² support the model.

Table-4: Results of ANOVA

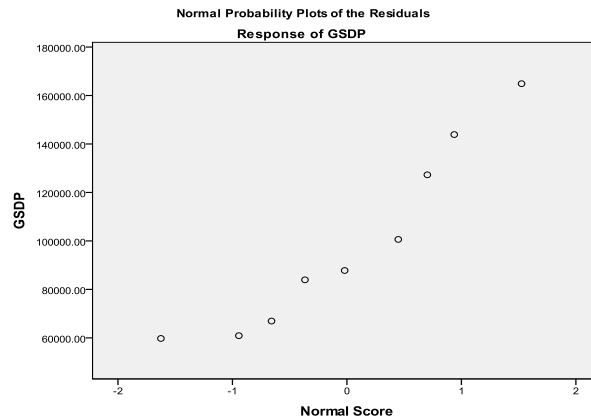
Sources	Sum of Squares	df	Mean Square	F	p
Regression	10494056744.750	2	5247028372.375	30.501	.001
Residual	1032159079.250	6	172026513.208		
Total	11526215824.000	8			
a. Predictors: (Constant), GOI, ID b. Dependent Variable: GSDP					

Results of ANOVA have something to say here as the value of F-statistic is moderately high. It simply means that the explanatory variables are not able to explain properly the variation in the explained variable. However, a moderately high F-value and a very low p-value support the fitting of our regression model.

Regression Graph

Probability plot of the residuals of the regression model seems to be normal (as it seems to be forming an approximate straight line) again provide support for the fitted regression model and for normal distribution.

Figure-2: Probability Plots of the Residuals



Conclusion

In this paper the relationship between debt and economic growth for Jharkhand has been investigated on economic data through (2001-02 to 2013-14) for Model-I and through (2004-05 to 2012-13) for Model-II. In Model-II, the debt has been divided according to the source into different groups like internal debt and GOI debt, etc., to add some dynamics to the model. In the earlier views/literature surveys of debt, debt was considered as a burden of the economy. But in Jharkhand, as our study suggest, the debt has been used

for the investment purpose and there is no doubt about its being productive. The paper has analyzed the greater relationship between debt and economic growth in Jharkhand. And on the basis of that one important fact which the study highlighted is mismanagement of GOI debt capital. The state Government must utilize the GOI debt capital for the purpose of increasing the pace of infrastructural development which will result in rapid economic growth.

Thus, it's clear that public debt or any sub-group of public debt like the GOI debt or internal debt must be taken as a source of capital. And we all know that capital helps the domestic saving, government revenues, covers fiscal deficit and also contributes to economic development.

Appendix

Debt and GSDP of Jharkhand (in Rs. Crores)

Year	GSDP	OD	ID	GOI
2001-02	35069	7804.37		
2002-03	37967	8923.32		
2003-04	42449	10569.48		
2004-05	59758	13511.69	9652.83	2991.82
2005-06	60901	17360.07	13017.79	2846.4
2006-07	66935	19417.37	14422.62	2701.21
2007-08	83950	21614.58	15858.86	2540.26
2008-09	87794	24083.98	17568.15	2404.14
2009-10	100621	27165.02	19880	2271.51
2010-11	127281	28655.06	21131.39	2167.21
2011-12	143891	30663.77	22285.78	2024.2
2012-13	164876	34260	25201.6	2024.4
2013-14 (BE)	189208	38930		

Source- Economic Survey of GOJ- 2007-08 & 2013-14

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