

Burden of Public Debt, Growth and Poverty: A State Level Investigation in the Indian Context

Ritwik Sasmal

Ph.D. Scholar

Department of Economics, Vidyasagar University, Midnapore

Email: ritwikster@gmail.com

Abstract

This paper examines the effect of debt liability of the government on economic growth and poverty alleviation in the major states of India. The proposition is that if the burden of public debt is high, the amount of debt servicing will be also high. In that case sufficient funds can not be allocated for economic growth and welfare measures for the poor. The theoretical result of this study suggests that if a greater share of the available fund is used for debt servicing, the growth rate declines. The empirical results of panel regression based on state level data in the Indian context show that a higher ratio of gross fiscal deficit to state GDP reduces per capita income and increases poverty. The other factors like gross capital formation, capital expenditure of the government are effective in reducing poverty through their positive impact on per capita income. On the other hand, if poverty is high in a state, revenue collection will be low and, in that case, public debt will rise. A kind of reverse causality may be there between debt burden and poverty. This problem has been partially addressed in this study.

Key words: *state gross fiscal deficit, debt servicing, available budgetary funds, growth, per capita income, poverty.*

JEL classification: *H6, H53, E6, O23*

1. Introduction

The economic growth and poverty alleviation are the two major objectives in the developing countries like India. These objectives are closely associated with public expenditure and fiscal health of the state. There is rich literature on public expenditure and economic growth. The studies on this topic have examined the effect of public expenditure on economic growth and poverty alleviation. There is a debate on which types of government expenditures are more effective in accelerating growth. At the same time, there is difference of opinion on the strategy of poverty alleviation. Growth vs. direct measures is a very well known controversy in the formulation of the policy measures for poverty alleviation. In any case, economic growth is important for poverty alleviation. This paper plans to examine the effect of fiscal burden of public debt on economic growth and poverty alleviation. Like most of the countries in the developing world, in many states of India the burden of public debt is very high. To meet the requirements of financial resources for economic development and social welfare most of the states are to resort to the policy of public debt. The collection of tax and non-tax revenues is not sufficient for this purpose. The fiscal deficit and revenue deficit are so high that many states are forced to take fresh public debt for the payment of interest on loans and for other expenditures. The debt servicing every year involves payment of huge interest on previous loans and repayment of original loans. In many cases the collections of tax and non-tax

revenues are not sufficient to allocate necessary funds for economic growth and poverty alleviation after meeting the mandatory requirements of debt servicing. In this context how economic growth and level of poverty are affected by debt-burden of the state is the main query of this study. So far as the role of public expenditure in economic growth is concerned, Barro (1990) shows that government spending increases productivity and promotes growth. However, in a balanced budget growth model, the growth rate initially increases with increase in the tax rate and after certain point the growth rate declines as tax rate is increased. Alesina and Rodrik (1994) demonstrate theoretically that inequality is harmful for growth. If inequality is high in the society, the demand for larger government expenditure will be also high. Then the tax rate on income will be higher and this will discourage investment and growth. Apart from the size of public expenditure, the composition of public expenditure is also important for growth. So, where the public money is being spent really matters in economic growth. As growth has implications for poverty alleviation the nature of govt. spending has impact on poverty. It is argued that if a greater share of the total spending of the govt. is disbursed on distributive and welfare measures, the growth rate may be slowed down. Devarajan et al. (1996) show that current expenditure is more helpful for growth compared to capital expenditure in a cross-country study of the developing world. Barro (1991), however, finds different results in a similar study. He shows that capital expenditure is more effective in promoting economic growth. Sasmal and Sasmal (2016) have shown in the Indian context that if greater share of public expenditure is allocated for the development of infrastructure, it significantly helps economic growth and reduces poverty. Similar results have also been obtained by Marjit et al. (2020) in the Indian context. The study finds that the allocation of budgetary funds have political dimensions also. Although the capital expenditure is more productive and helpful for growth, the government prefers to allocate a greater share on revenue expenditure to ensure its political gain at the cost of long term growth. Bruce and Turnovsky (1999) have explained in a theoretical model that if the public expenditure is financed by public borrowing, the sustainability of public debt and fiscal policy are very important. They have considered two types of government spending: productive expenditure and consumption expenditure. The study shows that the debt policy will be sustainable if the economy is capable of generating larger amounts of primary surplus to repay the previous loans. Otherwise, there has to be a provision for lump-sum tax on the people. Using the idea of Bruce and Turnovsky (1999), Sasmal and Sasmal (2020) have explored alternative measures of sustainability of public debt in the Indian context. They have shown that the ratio of fiscal deficit to net national product and the ratio of interest payment on public debt in total expenditure of the government will give an idea about the fiscal position of the country. Akram (2016) examines the effect of public debt, both external and internal, on growth and poverty in selected South Asian countries for the period from 1975 to 2010. The results show that public debt has negative impact on growth but its effect of external debt on inequality is insignificant. The domestic debt, however, has negative relationship with inequality and it is pro-poor in nature. Loko et al. (2003) mention the argument that a large external debt burden is a major cause of poverty through its effect on economic growth and human development. It is also noted in the study that there increasing empirical evidence that growth plays a key role in poverty reduction. Ghura et al. (2002), however find that increase in average income does not always to lead to rise in income of poor. Krugman (1988) argues that the servicing of heavy debt many directly divert budgetary resources from investment to the payment interest on loan and repayment of loan and thereby hamper growth. The main point is that if debt burden hampers growth, it will have adverse impact on poverty. Also, the high debt burden will lead to curtailment of social expenditure for the poor. In the context of multi-dimensional poverty, the study of Loko et al. (2003) finds that debt ratio to GDP in the developing nation has negative impact on life expectancy and positive impact on infant mortality. Higher per capita GDP has positive impact on life expectancy &

literacy and negative impact on infant mortality. That means poverty declines. In the Indian states like Bihar and Uttar Pradesh poverty was very high in 1993-94 and 2004-05 (60.5 per cent and 54.4 per cent in Bihar and 48.4 per cent and 40.9 per cent in Uttar Pradesh respectively). In the same respective years their debt-SGDP ratios were also very high. In Bihar they were 6 per cent and 8.5 per cent respectively and in Uttar Pradesh these ratios were 5.5 per cent and 5.6 per cent respectively. In developed states like Haryana and Tamil Nadu, poverty was much lower. 35.9 per cent and 24.1 per cent respectively in the above two years for Haryana and 44.6 per cent and 28.9 per cent in Tamil Nadu. The debt-SGDP ratios were also lower. In Haryana it was 2.9 per cent and 3.9 per cent and Tamil Nadu they were 3.6 per cent and 3.5 per cent in 1993-94 and 2004-05 respectively. In this background the present study is trying to investigate the impact of debt-liability of the govt. on growth and poverty in the states of India using a theoretical model and empirical results based on state level data. It is very clear that if debt liability of a state is high, then sufficient financial resources can not be allocated for development of infrastructure and capital formation. Neither will it be possible to allocate sufficient funds for welfare measures. In that case, not only growth will suffer but also the goal of poverty alleviation can not be achieved. So, it is likely that in the states when debt liability is high, growth rate will be low and poverty will be high. The reverse causality may be also there. If poverty is high in a state, sufficient financial resources can not be mobilised through tax and non-tax revenues. In that case, the govt. will have to depend more and more on public debt. So, poverty may be a cause of higher debt liability in the state. So, all these things will be analysed in this paper. A theoretical model has been constructed in endogenous growth framework to show that if a greater share of available fund is used for debt servicing, the growth rate will decline. The second part is empirical analysis. In panel regressions using state level data, the effect of debt liability on per capita income, poverty and other variables have been estimated. Similarly, the impact of growth (measured by per capita income) on poverty has been examined. The analysis also examines the effect of poverty on debt liability of the state. The whole work has been arranged as follows: The theoretical model has been presented in the section 2. Section 3 gives data and methodology of empirical analysis. The economic results and discussions have been presented in section 4. Section 5 gives conclusions.

2. Theoretical Framework

Barro (1990) considered an endogenous growth with balanced budget expenditure of the government. That is, government expenditure, G , is equal to tax collection, T . The tax revenue is T and tax is imposed on income at a fixed rate τ . So, $T = \tau \cdot Y = G$.

Bruce and Turnovsky (1999) have introduced public debt into the growth model and examined the sustainability of public debt and fiscal policy in growth process. In this paper we like to consider a growth model with deficit budget.

The basic hypothesis of this paper is that if the debt burden of a state or a country is high, poverty will be high due to lower growth rate. So, this work tries to show the effect of debt burden of the government on economic growth and level of poverty. Following Barro (1990) and Bruce and Turnovsky (1999), we have considered an endogenous growth model with public debt. Apart from tax collection from income, here the government mobilises funds for government expenditure through public debt. The fund from debt is collected from sale of bonds (B) to the public for which interest is paid at the rate of r . The government has debt servicing for such bonds including interest payments on bonds and repayment of original amount of the loans. The households, on the other hands, earns interest income from the

investment on such bonds. Now, the income of the household is $(Y + rB)$ on which tax is paid at the rate of τ . Here, the budget constraint of the household is:

$$\dot{B} + \dot{K} = (1 - \tau)(Y + rB) - C \quad (1)$$

Both B and K are increasing over time. The utility function of the household

$$U = \frac{C^{1-\theta}}{1-\theta} \quad (2)$$

Here, θ is constant elasticity of substitution in inter-temporal consumption. Due to debt-liability, the government expenditure changes. The debt-servicing is a compulsory payment of the government to the bond holders. Total available fund of the government is now R where:

$$R = T + B = \tau \cdot Y + B \quad (3)$$

A portion of the total budgetary resource (R) is paid for debt servicing. Suppose β is the fraction of R goes to debt servicing and β is given. The value of β and the amount of debt servicing (DS) depend on the fiscal deficit every year. If fiscal deficit is higher, DS is higher. In that case β is also higher. After payment of DS, the remaining part of the total financial resource (R) can be used as government spending (G) in production function. The fiscal deficit is defined as the net borrowing of the government (D) and it is expressed as the ratio of GDP denoted by η where

$$\eta = \frac{D}{Y}.$$

β is a positive function of η .

$$\beta = f(\eta), f'(\eta) > 0, f''(\eta) < 0,$$

assuming that B has a proportionate relationship with η .

The remaining part of the available fund which is used as government expenditure may be used for economic growth and social sector development. Both types of expenditures have implication for poverty alleviation and economic growth.

Here, $(1 - \beta) \cdot R = G$. So, following Barro (1990) the production function is now can be expressed as

$$Y = AK^\alpha (L \cdot (1 - \beta) \cdot R)^{1-\alpha} \quad (4)$$

In (4), Y is output, K is physical capital and L is Labour. A is given technological efficiency. L is assumed to be constant. α and $(1-\alpha)$ are production elasticities of Y with respect to K and L respectively. L is now measured in efficiency terms. This is a form of Cobb-Douglas production function with CRS. Incorporating debt burden of the government into the model, the objective of the households becomes the maximisation of the discounted total utility over the infinite planning horizon and it is expressed as

$$\text{Max}_C V = \int_0^{\infty} \left(\frac{C^{1-\theta}}{1-\theta} \right) = e^{-\rho t} \cdot dt \quad (5)$$

$$\text{s.t. } \dot{B} + \dot{K} = (1 - \tau)(Y - rB) - C$$

Here, the state variable is K and control variable is C . The shadow price of K is v . This is a dynamic optimisation problem which can be solved by using Hamiltonian in optimal control theory.

At the same time, after solving the Hamiltonian we derive the optimal growth path of consumption. We get the optimal growth paths for K and Y . In a balanced growth path,

$$g_C = g_K = g_Y$$

Therefore, the economic growth rate becomes

$$g_Y = g_C = \psi = \frac{1}{\theta} \{(1 - \tau)MP_K - \rho\} \quad (6)$$

From (4), the MP_K can be derived as

$$MP_K = \frac{\partial Y}{\partial K} = A' \cdot \alpha \cdot K^{\alpha-1} \cdot (R)^{1-\alpha} \cdot (1 - \beta)^{1-\alpha} \quad (7)$$

Here, $A' = A \cdot L^{1-\alpha}$

In balanced growth, Y, B, G, R will grow at the same rate. So, given τ, α and β if MP_K is constant it will satisfy the conditions of endogenous growth.

Equation (7) can be written as

$$MPK = \frac{\partial Y}{\partial K} = A' \cdot \alpha \cdot \left(\frac{R}{K}\right)^{\alpha-1} \cdot (1 - \beta)^{1-\alpha} \quad (8)$$

As $\left(\frac{R}{K}\right)$ is constant in a balanced growth path MP_K is constant. So, it satisfies the condition of endogenous growth.

Now, the growth rate becomes

$$\psi = \frac{1}{\theta} \left\{ (1 - \tau) \left[A' \cdot \alpha \left(\frac{R}{K}\right)^{\alpha-1} \cdot (1 - \beta)^{1-\alpha} \right] - \rho \right\} \quad (9)$$

To examine the effect of debt servicing on the growth rate, we differentiate (9) w.r.t. β and get

$$\frac{\partial \psi}{\partial \beta} = -(1 - \alpha) \cdot \frac{1}{\theta} \left\{ (1 - \tau) \left[A' \cdot \alpha \cdot \left(\frac{R}{K}\right)^{\alpha-1} \cdot (1 - \beta)^{-\alpha} \right] - \rho \right\} \quad (10)$$

Here, $\frac{\partial \psi}{\partial \beta} < 0$. That is, growth rate declines if the debt burden of the government increases.

The implication is very clear. If fiscal deficit is high the debt burden will increase, and this will leave very limited budgetary resources for growth and development purposes. But economic growth is important for reduction of poverty. As growth suffers due to high debt liability, this will have adverse impact on poverty. This will also hamper poverty alleviation due to shortage of funds for welfare measures for the poor.

3. Data and Methodology

The variables used in the panel regressions of this study are per capita net state domestic product at constant price (pc_nsdpcnsp), gross capital formation (gross_capital), share of revenue expenditure in total govt. spending (rato_re), public expenditure on social development (pub_exp_social), ratio of gross fiscal deficit to state GDP (sgfd_gdp), poverty ratio in the state (poverty_hcr), public expenditure on infrastructure (pub_exp_infr), industrialisation in the state (indus_nsdpcnsp), literacy rate, productivity in agriculture (agri_prod) and capital expenditure of the govt. (capital_exp) and density of population per square km in the state (pop_den_sqm). Four rounds of data on poverty are available for the years 1993-94, 2004-05, 2009-10 and 2011-12. The source of data is 'Handbook of Statistics on state government Finances', RBI (several issues). The data has been taken on 17 states of India. They are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. All the big states have been taken in the study. Two special category states Assam and Jammu & Kashmir have been taken because of their large size. The small states have not been included. Fixed effects and Random effects models have been used in panel regression following Baltagi (2021) and Wooldridge (2009).

The equation for the panel regression is:

$$Y_{it} = \beta_0 + \beta X_{it} + u_i + \varepsilon_{it}$$

where, Y_{it} is the dependent variable with value of the i th individual observed in time t and X_{it} is the i th independent variable, u_i is the unobserved individual heterogeneity of i th entity of the dependent variable; ε_{it} is the error term of the i th entity in time t . In Fixed effects model:

$$E(X_{it}, u_i) \neq 0$$

that is, X_{it} and u_i are correlated. In Random effects model, X_{it} and u_i are uncorrelated. i.e., $E(X_{it}, u_i) = 0$.

The Hausman test has been used to examine the appropriate model.

It has been mentioned that there may be a two-way relationship between debt burden and poverty. That is, the problem of endogeneity might be relevant in this case. To avoid the problem of endogeneity in panel regression, the scholars have suggested to apply Generalized Method of Moments (GMM) and use instrumental variables in appropriate manner (Loko et al. 2003; Akram, 2016; Murray, 2006). However, for practical purposes, to avoid endogeneity in panel regression, Devarajan et al. (1996) has taken dependent variable in forward lag and Akram (2016) has used independent variable in backward lag. In this study, following the existing literature, we have used the independent variable debt-state GDP ratio (ratio_sgfd_sgdp) in 3-year lag to capture its cumulative effect on poverty in the subsequent period. However, this may not be a full proof robust result and it can be addressed in a better way in future research. Here, the specific equations are:

$$(i) \ln_pc_nsdp_cnsp_t = A_0 + A_1 pub_exp_infr_t + A_2 ratio_sgf_sgdp_{t-3} + A_3 indus_nsdp_t + u$$

$$(ii) poverty_hcr_t = B_0 + B_1 \ln_pc_nsdp_cnsp_t + B_2 \ln_social_exp_t + B_3 literacyrate + u$$

$$(iii) \text{poverty_hrc}_t = C_0 + C_1 \ln_agri_prod_t + C_2 \text{ratio_sgfd_sgdp}_{t-3} + u$$

These three equations have been estimated in *Table 1, 2 and 3* respectively. Similar equations have been estimated in *Table 4, 5, 6 and 7*.

4. Empirical Results and Discussion

The results in *Table 1* show that the ratio of state fiscal deficit (sgfd) to state gross domestic product (sgdp) has significant negative impact on per capita net state domestic product at constant prices (pc_nsdpcns). It implies that if the debt burden of the state is high it will have significant adverse effect on growth and per capita income. The reason is very clear. Since the state has greater debt liability, it is difficult for the state to allocate sufficient funds for development purposes. It is supported by another result of the *Table 1*. The share of public expenditure on infrastructure (pub_exp_infr) has significant positive impact on per capita income. The development of infrastructure like roads and highways, railways, air and seaports, power generation, irrigation, warehousing, etc. has crucial role in increasing productivity, investment, and economic growth. The government has an important role also in the development infrastructure in developing countries like India. But the states which face huge fiscal burden due to public debt, are not in a position to allocate sufficient funds for infrastructure development. In effect, growth suffers, and per capita income remains low. Industrialisation (indus_nsdpcns) in the state has positive and significant impact on per capita income. It is quite natural that if the industrial growth is higher in the state, per capita income will rise.

Table 1. Panel regression of log of per capita income in the state (ln_pc_nsdpcns) on the ratio of gross fiscal deficit to state GDP (ratio_sgfd_sgdp) in lag and other factors.

Random-effects GLS regression #		Number of observations	=	68
Group variable: state		Number of groups	=	17
R ² :	within	=	0.5168	
	between	=	0.4912	
	overall	=	0.4941	
corr (u _i , X)	=	0 (assumed)		
		Wald chi2(3)	=	63.63
		Prob> Chi2	=	0.0000

ln_pc_nsdpcns	Coefficient	z	P > z
pub_exp_infr	4.692	6.08 *	0.000
ratio_sgfd_sgdp	-0.080	-2.78 *	0.005
indus_nsdpcns	3.100	2.57 *	0.010
_cons	8.363	23.52 *	0.000

* significant at 1% level.

Hausman test accepts random effects model.

The results of *Table 2* examine the effect of per capita income (pc_nsdpcns) on the ratio of poverty (poverty_hcr) along with other factors. It is found that rise in per capita income significantly reduces poverty in the state. This result suggests that economic growth and rise in per capita income are very important for poverty alleviation. This result is consistent with the findings of Sasmal&Sasmal (2016). If growth is slowed down due to higher burden of public

debt or any other reason, poverty will rise. That means, the debt burden affects poverty through its impact on growth and per capita income. This is an important finding of this study. In *Table 2*, the other two factors, social expenditure and literacy rate are found to have no significant effect on poverty. Possibly, the per capita income has subsumed the effects of these two factors in reducing poverty. In many studies social sector expenditure of the government and literacy rate have been found to have reduced poverty. Here, they are insignificant possibly due to the fact that per capita income has subsumed the effects of social sector expenditure and literacy on poverty.

Table 2. Panel regression of poverty (poverty_hcr) on log of per capita income in the state (ln_pc_nsdpcns) and other factors.

Random-effects GLS regression #	Number of observations	=	68
Group variable: state	Number of groups	=	17
R ² : within	=	0.8611	
between	=	0.3930	
overall	=	0.5985	
corr (u_i, X)	=	0 (assumed)	
	Wald chi2(3)	=	301.67
	Prob> Chi2	=	0.0000

poverty_hcr	Coefficient	z	P > z
ln_pc_nsdpcns	-11.69824	-7.45 *	0.000
ln_social_exp	-1.424112	-0.88	0.378
literacyrate	-.1011921	-0.82	0.413
_cons	161.7354	17.89 *	0.000

* significant at 1% level.

Hausman test accepts random effects model.

While in *Table 2*, the effect of debt burden of the government on poverty has been examined via its effect on growth and per capita income. In *Table 3*, the direct effect of public debt on poverty has been checked along with other factors. The result shows that state gross fiscal deficit as ratio of state GDP has significant positive impact on poverty implying that if debt burden rises poverty will also rise. This result reinforces the previous results and arguments presented in *Table 1* and *2*. That is, if the burden of debt is high, less fund or no fund will be allocated for growth and welfare measures to reduce poverty. The result also shows that if the productivity in agriculture rises poverty will decline. This is because the income of the farmers and agricultural labourers will increase. In a country like India, where a large section of the population are still dependent on agriculture, rise in productivity will definitely have a favourable effect on poverty alleviation. On the other hand, the share of revenue expenditure in total spending of the government (ratio_re) has been found to be insignificant. It is not difficult to explain this result. The revenue expenditure of the government comprises mainly committed expenditures like wage and salary, pension, interest payment on loan, subsidy, administrative expenses etc. many of which are non-developmental in nature or unproductive.

Table 3. Panel regression of poverty (poverty_hcr) on the ratio of gross fiscal deficit to state gdp (ratio_sgfd_sgdp) in lag and other variables.

Random-effects GLS regression #	Number of observations	=	68
Group variable: state	Number of groups	=	17
R ² : within	=	0.5288	
between	=	0.1857	
overall	=	0.2555	
corr (u _i , X)	=	0 (assumed)	
	Wald chi2(3)	=	45.38
	Prob> Chi2	=	0.0000

poverty_hcr	Coefficient	z	P > z
ln_agri_prod	-27.435	-5.79 *	0.000
ratio_sgfd_sgdp	1.357	2.61 *	0.009
ratio_re	2.698	0.14	0.891
_cons	227.355	5.98	0.000

* significant at 1% level.

Hausman test accepts random effects model.

The gross capital formation (ln_gross_cap) and capital expenditure of the government (capital_exp_cr) are crucial for growth and reduction of poverty. But these factors could not be taken with other factors in the same equation due to the problem of multicollinearity. Here in Table 4, gross capital formation is found to have significant negative impact on poverty. This is due to its positive impact on growth. The capital expenditure has significant negative effect on poverty because it enhances growth, and this result is consistent with the findings of Marjit et al. (2020). As growth takes place per capita income rises leading to decline of poverty. The density of population (pop_den_sqm) is found to have no effect on poverty.

Table 4. Panel regression of poverty (poverty_hcr) on gross capital formation (ln_gross_cap), capital expenditure of the govt. (cap_exp) and population density (pop_den_sqm)

Fixed-effects (within) regression #	Number of observations	=	68
Group variable: state	Number of groups	=	17
R ² : within	=	0.7344	
between	=	0.0725	
overall	=	0.0460	
corr (u _i , Xb)	=	-0.5945	
	F(3,48)	=	44.23
	Prob> F	=	0.0000

poverty_hcr	Coefficient	t	P > z
ln_gross_cap	-4.247249	-4.48 *	0.000
capital_exp	-.0007571	-3.12 *	0.003
pop_den_sqm	-.021174	-1.49	0.142
_cons	87.96031	8.38 *	0.000

* significant at 1% level.

Hausman test accepts fixed effects model.

In explaining growth and poverty in the event of high fiscal burden of public debt, our argument is that if debt is high, the state will not be in a position to allocate sufficient fund for the development of infrastructure necessary for growth. The result in *Table 5* shows that fiscal deficit as ratio of sgdp has significant negative effect on infrastructure. So, our hypothesis is vindicated by this result. The other two factors, social sector expenditure and industrial growth have no significant effect on infrastructure although their coefficients are positive.

Table 5. Panel regression of public expenditure on infrastructure (pub_exp_infr) on the ratio of gross fiscal deficit to state gdp (ratio_sgfd_sgdp) and other factors.

Fixed-effects (within) regression #	Number of observations	=	68
Group variable: state	Number of groups	=	17
R ² : within	=	0.1531	
between	=	0.0817	
overall	=	0.0068	
corr (u _i , Xb)	=	-0.3727	
	F (3, 48)	=	2.89
	Prob> Chi2	=	0.0448

pub_exp_infr	Coefficient	t	P > z
ratio_sgfd_sgdp	- 1.039565	- 2.63 **	0.011
indsnsdp	0.263773	0.08	0.934
ratio_social_exp	.0727291	0.40	0.688
_cons	.1558387	1.28	0.206

** significant at 5% level.

Hausman test accepts fixed effects model.

We have so far discussed that if the fiscal burden of public debt is high, it will have adverse effect on economic growth and poverty alleviation. Let us now check the reverse causality. It may be the case that as poverty is high in a state, the government depends more on public borrowing to meet its expenditures on administration, welfare schemes and economic development. In many states of India, there is high revenue deficit. That means, current revenue is not sufficient to meet its current expenditures. It is obvious that in a state where poverty is high, the collection of revenue will be low. *Table 6* shows that poverty has significant positive effect on debt liability of the state. Since there may be both way causality between the debt burden and poverty, some problem of endogeneity might be there. To avoid the problem of endogeneity, the independent variable (ratio_sgfd_sgdp) has been taken in lag following the existing literature (for details see methodology and results in *Table 1* and 3).

Table 6. Panel regression of the ratio of gross fiscal deficit to state gdp (ratio_sgfd_sgdp) on poverty and social expenditure of the govt.

Fixed-effects (within) regression #	Number of observations	=	68
Group variable: state	Number of groups	=	17
R ² : within	=	0.2500	
between	=	0.1583	
overall	=	0.0053	
corr (u _i , Xb)	=	-0.5700	
	F (2, 49)	=	8.17
	Prob> Chi2	=	0.0009

ratio_sgfd_sgdp	Coefficient	t	P > z
poverty_hcr	.0011243	3.62 *	0.001
pub_exp_social	.0480195	0.76	0.451
_cons	-.0161368	-0.52	0.608

* significant at 1% level.

Hausman test accepts fixed effects model.

In addition to economic growth, social sector development, and welfare measures also help reduction of poverty. Now, if the government allocates sufficient funds for social sector, this may lead to high fiscal burden of public debt. The results in *Table 7* corroborates this proposition. Here, it is found that the effect of social sector expenditure (pub_exp_social) has significant positive impact on public debt. That means if the government allocates larger funds for social sector to reduce poverty its debt burden may increase. The industrial growth (indus_nsdp) is found to have negative impact on public debt. This is because with industrial growth government revenue increases. As a result, dependence on public debt decreases.

Table 7. Panel regression of the ratio of gross fiscal deficit to state gdp (ratio_sgfd_sgdp) on social expenditure of the govt. (pub_exp_social) and industrial development (indus_nsdp)

Fixed-effects (within) regression #	Number of observations	=	68
Group variable: state	Number of groups	=	17
R ² : within	=	0.1495	
between	=	0.0164	
overall	=	0.0051	
corr (u _i , Xb)	=	-0.6319	
	F (2, 49)	=	4.31
	Prob> F	=	0.0189

ratio_sgfd_sgdp	Coefficient	t	P > z
pub_exp_social	.1342886	2.05 **	0.046
indus_nsdp	-.2469156	-2.40 **	0.020
_cons	-.0364837	0.93	0.356

** significant at 5% level.

Hausman test accepts fixed effects model.

5. Conclusions

This paper plans to examine the effect of the burden of public debt on growth and poverty. The objective is to see what happens to growth and poverty if the debt burden of a state is high. Like many countries in the developing world in India also the burden of public debt is high in most of its states. The main proposition of this paper is that if the debt liability is high, a large share of the available budgetary fund of the government will be allocated to debt servicing in the forms of payment of interest on public debt and repayment of loans. In that case, sufficient financial resources can not be allocated for economic growth and welfare measures for reduction of poverty. As a result, growth will suffer, income will be low and poverty will rise. The problem has been analysed in this work by a theoretical model and with the help of econometric results based on state level data in the Indian context. The theoretical result suggests that if a greater share of funds is allocated to debt servicing, the growth rate declines. The empirical results of panel regression show that the ratio of gross fiscal deficit (sgfd) to state GDP reduces per capita income and increases poverty. It indicates, growth is important for reduction of poverty. Among other factors, gross capital formation and higher capital expenditure of the government accelerate growth and thereby reduce poverty. As a large section of the population in countries like India depend on agriculture for their livelihood, rise in productivity in agriculture has significant negative impact on poverty. There is some problem of reverse causality also. That is, poverty may lead to higher debt burden in a state. This means, if the collection of revenues is low in a state due to high poverty, the government will have to depend on public debt to meet its expenditures on various heads. It has been found that if poverty is higher, the ratios of sgfd to SGDP rises. This is a kind of endogeneity problem between debt burden and poverty which has been partially taken care of in this paper. There is scope for obtaining more robust results on this point in further studies by using correct and strong instrumental variables in panel regression.

Acknowledgement:

The author is indebted to his Ph.D. Supervisor Professor Pinaki Das for his guidance and help. He acknowledges the valuable help and suggestions received from his respected teacher, Professor Sebak Kumar Jana. He is also thankful to the anonymous referee(s) for their valuable comments and suggestions.

References

- Akram, N. (2016). Public debt and pro-poor economic growth evidence from South Asian countries. *Economic Research-Ekonomska Istraživanja*, 29(1), 746-757.
- Alesina, A., & Rodrik, D. (1994). Redistributive politics and economic growth. *Quarterly Journal of Economics*, 109(2), 465-490.
- Baltagi, B. H. (2021). *Econometric Analysis of Panel Data*. Springer, Edition 6, No. 978-3-030-53953-5, March.
- Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy*, 98 (5 – Part 2), S103-S125.
- Barro, R. J. (1991). Economic growth in a cross section of countries. *Quarterly Journal of Economics*, 106(2), 407-444.
- Bruce, N., & Turnovsky, S. J. (1999). Budget balance, welfare and the growth rate: ‘Dynamic scoring’ of the long-run government budget. *Journal of Money, Credit and Banking*, 31(2), 162-186.

- Devarajan, S., Swaroop, V., & Zou, H. (1996). The composition of public expenditure and economic growth. *Journal of Monetary Economics*, 37(2), 313-344.
- Ghura, D., Carlos, A. L. and Charalambos, T. (2002). Is growth enough? Macroeconomic Policy and Poverty Reduction. *IMF Working Paper*, 02/118 (July).
- Krugman, P. (1988). Financing vs. forgiving a debt overhang. *Journal of Development Economics*, vol. 29, 253-68.
- Loko, B., Mlachila, M., Nallari, R. and Kalonji, K. (2003), The impact of External indebtedness on poverty in low-income countries. *IMF Working Paper*, WP/03/61 (March).
- Marjit, S., Sasmal, R. and Sasmal, J. (2020). Composition of public expenditure and growth of per capita income in Indian states: a political perspective. *Journal of Social and Economic Development*, 22(1),1-17.
- Murray, M. P. (2006). Avoiding invalid instruments and coping with weak instruments. *Journal of Economic Perspectives*, 20(4), 111-132.
- Reserve Bank of India. *Handbook of Statistics on the state government finances*, Reserve Bank of India (several issues).
- Sasmal, J. &Sasmal, R. (2020). Public debt, economic growth and fiscal balance: alternative measures of sustainability in the Indian context. *Global Business Review*, 21(6), 780-799.
- Sasmal, R. &Sasmal, J. (2016). Public expenditure, economic growth and poverty alleviation. *International Journal of Social Economics*, 43(6), 604-618.
- Wooldridge, J.M. (2009). *Introductory Econometrics: A Modern Approach*. Cengage Learning, Edition 4.