Public Expenditure and its Impact on Per Capita Income in Indian States

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Abstract

This paper examines the composition of public expenditure and its impact on per capita net state domestic product on some major Indian states. In general, growth means rise of per capita net state domestic product (nsdp) over time. Revenue expenditure is considered to be less productive than capital expenditure. Per capita net state domestic product in some states in India is very high and in some states it is low. The panel regression based on major states in India shows that revenue expenditure has less effect on growth. On the other hand, capital expenditure has significant and positive impact on growth of per capita net state domestic product (nsdp).

1. Introduction

The role of government in various sectors of economic component like education, health, social welfare and economic growth are important issues in public economics and public finance. Which component of government expenditure is more helpful and productive remains a controversial issue in economic literature. The nature and composition of government spending and its impact on economic growth has become an important area of research. There is also a debate on the optimal size of the government. If inequality is high in the society there will be demand for a largergovernment although it may affect economic growth severely. Taxation and public spending are considered as important instruments of redistribution in the society. Though it is not the only mechanism for redistribution, informalisationof the economy and weak governance can be an alternativeroute for redistributive policies (Marjit, Mukherjee and Kolmar,2006). The idea of optimal fiscal policy is somehow ambiguous in less developed countries becausepolitical gain is the main concern in these countries. Though expenditure on less productive heads has adverse impact on economic growth but political stability can coexist with economic stagnation (Sasmal, 2011).

The expenditure on the development of infrastructure like road, irrigation, power generation telecommunication etc. which are lacking in the developing countries is likely to accelerate growth. However,if the governance level is weak and there is corruption and leakage of funds and lack of proper monitoring for the utilisation of funds and implementation of the projects

such expenditures will fail to generate human skill (Sasmal, 2011).Government generally bears two types of expenditures in all forms of its expenditure- revenue expenditure and capital expenditure. Capital expenditure broadly means expenditure on asset creation for economic and social development, repayment of loan and advance of loan for rural and economic services. If public accounts are included in other heads of public expenditure in the capital accounts then inter-state settlement, contingency fund, small savings, provident funds etc., reserve funds, deposits and advances, suspense and miscellaneous, appropriation of contingency fund and remittances are to be included (Handbook of Statistics on State Government Finances, Reserve Bank of India, various issues). Revenue expenditure includes expenditure on wages and salaries allowances, maintenance, pension, interest payment on loan and various payments and transfers in the current account. Some elements revenue expenditure are developmental and some are non-developmental.

Empirical study of the state expenditure policy and its impact on other variables, relationship with National Income and other variables was studied by German economist Adolph Wagner (1890). His theory was explanatory rather than prescriptive in nature. According to Wiseman and Peacock, the aim is to establish generalization about government expenditure, not from postulate about the logic of choice, but rather by inference from historical evidence. Adolph has based his law on increasing state activities on historical facts. The Median voter theory tells that if inequality is high in the society there will be demand for a larger government. Taxation and public spending are considered as important instruments of redistribution in the society (Meltzer and Richard, 1981; Alesinaand Rodrik, 1994; Persson and Tabellini, 1994). The government may adopt the policy of spending more on unproductive or less productive heads even with huge deficit in fiscal balance in the pursuit of political gain (Sasmal, 2011; Marjit,Kolmar and Mukherjee,2001; Marjit and Maity,2006). Although expenditure on less productive head has negative effect on economic growth, political stability can co-exist with economic stagnation (Sarkar,2006).

Banerjee and Newman (1993) and Galor and Zeira (1993) have been put forwarded a counter arguments to show that if redistributive policies can enhance human capital, they can accelerate growth. Barow (1990) in his endogenous growth model with government spending has shown that efficiency of labour will increase if government spends more on productive services and it helps growth. We get mixed results in respect of the question of which component of government expenditure is more productive and growth promoting. Current expenditure of the government is found to be more productive than capital expenditure in the empirical studies based on cross country data by Debrajan (1996); Ghosh and Gregoriou (2008). Barrow (1991) and Chen (2006) have shown that capital expenditure of the government has positive impact on growth. Bruce and Turnovsky (1990) shown that under certain conditions, reduction in public expenditure can improve the fiscal balance in the long run. The deficit in fiscal balance again adversely affects economic growth.

This work observes that though the share of revenue expenditure fluctuates over time but it has an increasing trend in almost all of the cases.Capital expenditure generally makes investment for development of infrastructure. Revenue expenditure on the other hand covers a wide variety of unproductive or less productive expenditures like pension, subsidy, paymentof interest on public borrowing and various social welfare schemes which may not be much effective in promoting economic growth.

The study is restricted to revenue expenditure and capital expenditure of the major states in India. There is no consideration of expenditure of central government. There is no consideration of private sector expenditure or public sector undertakings. The study will take into account the period from 2002 to 2016.Public accounts of public expenditure like- inter-state settlement, contingency fund, small savings, provident funds etc., reserve funds, deposits and advances, suspense and miscellaneous, appropriation of contingency fund and remittances are excluded from capital expenditure.

Objective of the Study:

Objectives of this studies are-
I) toanalyse the share of revenue expenditure andcapital expenditure of the major states in India from 2002 to 2014 .
ii) to study the per capita net state domestic product of these states after three years (2005 to 2016) of spending of revenue expenditure and capital expenditure.
Iv) to examine the impact of public expenditure on per capita income in the major states of India
The whole work has been arranged as follows: the methodology and data have been explained in section 2. Section 3 gives the analysis of net state domestic product (nsdp) and expenditure pattern of the state governments in India. Results of panel regression and their explanations have been presented in section4. Section 5 gives the summary and conclusions.

2. Methodology and Data

In panel regression both Fixed effects model (F.e.m) and Random effects model (R.e.m) have been estimated.
The Fixed effects model equation is :

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

Where Y_{it} is the dependent variable in period t.
And X_{it} is the observed explanatory variable in period t.
$\mu_i$is the unobserved individual characterstics of the ith entity.
$\varepsilon_{it}$is the error term in period t.

In Fixed effects model the observed explanatory variables and unobserved characteristics are correlated.

That is E $(X_{it}, \varepsilon_{it}) \neq 0$

In Random effects model the equation is the same but the observed explanatory variables and unobserved characteristics are uncorrelated.

That means E $(X_{it}, \varepsilon_{it}) = 0$

The Hausman Test has been used to examine the appropriateness of the regression model.

Per capita net state domestic product at constant prices in the major states over time is calculated from 2005 to 2016 taking a lag of three years after government spending although the lag is two for the last slot due to non-availability of data for all the states. Only the non-special category states have been selected for this study because in special category states grants and expenditure of the central government play important role. Naturally the expenditure pattern and its impact on income of the state government cannot be assessed properly.

As per the selection of years for the use of data it can be said that we have taken public expenditure (from 2002 to 2014) in lag of three years to avoid endogeneity.That means, the impact of expenditure is expected to be reflected in income after three years. The years have been chosen depending on data readily available from Handbook of statistics of state government finances of Reserve Bank of India (different editions).

It is possible to take data for the entire period from 2002 to 2016 and in that case we have to go for using the technique of panel cointegration. Definitely if data is analysed for the whole period it will give a more comprehensive picture and the results are likely to be robust. However there are good works in the panel regression using several rounds of data (Debrajan et al.,1996; Ghosh & Gregoriou,2008; Marjit et al.,2013). So following these works we used five rounds of data for panel regression in the study and we have got meaningful results. The purpose of taking per capita net state domestic product (nsdp) in forward lag is to suggest that it will take at least three years to reflect the impact of public expenditure on per capita income. Secondly this procedure will help avoid endogeneity problem. That means it is per capita income that changes due to change in government expenditure not the otherwise.

3.1 Empirical analysis of Net State Domestic product (NSDP) of major States of India

Table 1.Per capita net state domestic product at constant prices (in Rupees) of the major states in India

Major States/Year	**2005**	**2008**	**2011**	**2014**	**2016**
Andhra Pradesh	27179	33733	38556	79174	96374
Assam	17050	18922	21741	44809	52416
Bihar	7588	10297	13149	23223	25950
Chattishgarh	18530	23926	27163	61146	68321
Goa	80844	90409	129397	241081	308823
Gujarat	36102	43685	56634	111370	131853
Haryana	40627	49780	61716	124302	143211
Himachal Pradesh	35806	41666	49203	105241	119387
karnataka	29295	37687	41492	105697	124093
kerala	35492	43644	52808	112444	128550
Madhya Pradesh	15927	19462	23272	44336	53047
Maharastra	40671	50183	61276	114750	133141
Odisha	18194	22963	24542	54211	67522
Punjab	34096	41003	46325	95807	105387
Rajasthan	19445	23356	29612	64522	72072
Tamil Nadu	34126	43193	57093	106189	117806
Uttar Pradesh	13445	15713	18014	34583	38934
West Bengal	23808	27914	32164	54520	61245

Source: Data taken from RBI Handbook of statistics on state government finances (several issues)

From the table it is seen that throughout the years the per capita net state domestic product (nsdp) at constant prices in case of Goa is highest among major Indian states where as in case of Bihar it is lowest. In 2005, Maharastra was second in per capita nsdp and Haryana was third. Then came,Gujrat,Himachal Pradesh, Kerala, Tamil Nadu,Punjab, Karnataka,Andhra Pradesh respectively. The position of West Bengal in per capita nsdp was eleventh among major eighteen states.

In 2008, Maharastra andHaryana performed in the same manner. Then it is Gujarat, Kerala, Tamil Nadu, Himachal Pradesh,Punjab, Karnataka,Andhra Pradesh and West Bengal.

In 2011, in case of per capita nsdp the best performer is Goa. Then it is Haryana, Maharastra, Tamil Nadu,Gujarat, Kerala, Himachal Pradesh, Punjab, Karnataka, Andhra Pradesh, West Bengal respectively.

In 2014, the base year of per capita nsdp at constant prices changed. Previously the base year

was 2004-05, and now it is 2014-15.This year if the performance of various states is taken in a series it will be like Goa, Haryana, Maharastra, Gujarat, Kerala, Tamil Nadu, Karnataka, Himachal Pradesh, Punjab, Andhra Pradesh, Rajasthan, Chattishgarh, West Bengal respectively. The position of West Bengal came in thirteenth position. Previously it was in eleventh position in the last three consecutive years.

In 2016, the performance series is Goa,Haryana, Maharastra, Gujarat, Kerala, Karnataka, Himachal Pradesh, Tamil Nadu, Punjab,Andhra Pradesh, Rajasthan, Chattishgarh, West Bengal respectively. This year also the position of west Bengal in per capita nsdp is thirteen.

So from the above study it is seen that India's 'BIMARU'states are developing but not catching up. Over nearly two decades, the BIMARU states have remained at the bottom, Goa, Maharastra, Haryana Gujarat, Kerala remain at the top. Bihar has remained India's poorest state over the period. Prior to state elections these states,political leader have sought to claim that because of their leadership, their state is no longer in BIMARU states. Coined in the early 1980's by demographer Ashish Bose, the acronym was used for the Northern states contributing significantly to India's population explosion. In 2015, economist Vinita Sharma found that while these states had made progress individually, they had not converged with the Southern states. The richest Indian states resemble upper middle income countries of the world. From the table above it is seen that, West Bengal from 2014, lagged behind the so called BIMARU states.

3.2 Analysis of share of revenue expenditure in total expenditure

Revenue expenditure is a day to day expenditure or current expenditure of the government. Total government expenditure is classified into revenue expenditure and capital expenditure. Revenue expenditure includes all those things, some of which serves developmental purposes though some of these are non-developmental in nature, whereas capital expenditure is mostly developmental because it means asset creation, although some components are non-developmental. Firstly, we can discuss about the share of revenue expenditure in total expenditure then turn to capital expenditure. Total expenditure is the addition of revenue expenditure and capital expenditure including public accounts. As revenue expenditure increases, capital expenditure declines in the annual budget because total fund is constant. The table of share of revenue expenditure in total expenditure is given below-

Table2.Share of revenue expenditure in total expenditure of the major states of India

States/Year	2002	2005	2008	2011	2014
Andhra Pradesh	0.758	0.717	0.765	0.78	0.861
Assam	0.796	0.872	0.815	0.876	0.864
Bihar	0.79	0.787	0.767	0.773	0.766
Chattishgarh	0.81	0.767	0.779	0.788	0.839

Goa	0.833	0.769	0.758	0.788	0.822
Gujrat	0.796	0.744	0.747	0.752	0.473
Haryana	0.883	0.852	0.779	0.805	0.877
Himachal Pradesh	0.777	0.753	0.7	0.802	0.817
Karnataka	0.782	0.802	0.771	0.759	0.806
Kerala	0.87	0.873	0.867	0.856	0.898
Madhya Pradesh	0.767	0.71	0.737	0.653	0.737
Maharastra	0.857	0.761	0.764	0.831	0.856
Odisha	0.755	0.864	0.794	0.823	0.78
Punjab	0.855	0.89	0.856	0.898	0.876
Rajasthan	0.79	0.79	0.798	0.821	0.813
Tamil Nadu	0.852	0.826	0.791	0.766	0.818
Uttar Pradesh	0.783	0.779	0.728	0.806	0.726
West Bengal	0.836	0.767	0.847	0.875	0.842

Source: Data taken from RBI Handbook of statistics on state government finances (several issues)

From the table it is seen that share of revenue expenditure in total expenditure in 2002 in case of Andhra Pradesh is three fourth of total expenditure. We know that revenue expenditure means expenditure on salary, wage, subsidy, allowance, pension etc. It does not help in the process of production and income generation. So spend of lower revenue expenditure means spending of higher capital expenditure. Because capital expenditure and revenue constitute are the two part of total expenditure. In 2002, share of revenue expenditure in total expenditure of Odisha was the lowest, and then it came Andhra Pradesh, Madhya Pradesh, Himachal Pradesh, Karnataka, Uttar Pradesh, Bihar, Gujrat, Chattishgarh, West Bengal etc. In 2002 Haryana spend more on revenue expenditure, then Kerala, Maharastra, Punjab and Tamil Nadu spent accordingly.

In 2005, Madhya Pradesh spent lowest as share of revenue expenditure. Andhra Pradesh, Gujrat, Himachal Pradesh, Maharastra, West Bengal and Chattishgarh came next. Punjab spent most on revenue expenditure in 2005 and Kerala, Assam, Odisha, Haryana, Tamil Nadu spent accordingly.

In 2008, Himachal Pradesh spent lowest as share of revenue expenditure. Uttar Pradesh, Madhya Pradesh, Gujrat, Goa, Andhra Pradesh, Bihar came next. Kerala, Punjab, West Bengal, Assam spent most as share of revenue expenditure in 2008.

In 2011,Madhya Pradesh , Gujrat, Karnataka, Tamil Nadu, Bihar, Andhra Pradesh, Goa spent lowest accordingly as share of revenue expenditure and Punjab, Assam, West Bengal, Kerala, Maharastra spent highest.

In 2114 Gujrat spent lowest among all the states as share of revenue expenditure and Uttar Pradesh, Madhya Pradesh, Bihar, Odisha, Karnataka came next. The highest expenditure as share of total expenditure was done by Kerala, Haryana, Punjab, Assam, Andhra Pradesh, Maharastra, and West Bengal accordingly.

From the above discussion it is seen that West Bengal spent higher as share of revenue expenditure in total expenditure and it is highest in 2011 among all the years. In this year it spent almost .875 as share of revenue expenditure. In case of Madhya Pradesh it spent lowest as share of revenue expenditure among all the years and spent more as capital expenditure so the per capita net state domestic product has increased remarkably and it claim not to be included in BIMARU state now.

3.3 Analysis of share of capital expenditure in total expenditure

We have already said that capital expenditure is mostly developmental in nature though some components in it are non-developmental. Capital expenditure means asset creation. Expenditure made by the government for creation of capital asset in the economy is categorised as capital expenditure. The table of share of capital expenditure in total expenditure is given below-

Table 3.Share of capital expenditure in total expenditure of the major states in India

States/Year	2002	2005	2008	2011	2014
Andhra Pradesh	0.242	0.283	0.235	0.22	0.139
Assam	0.204	0.128	0.185	0.124	0.136
Bihar	0.21	0.213	0.233	0.227	0.234
Chattishgarh	0.19	0.233	0.221	0.212	0.161
Goa	0.167	0.231	0.242	0.212	0.178
Gujrat	0.204	0.256	0.253	0.248	0.527
Haryana	0.117	0.148	0.221	0.195	0.123
Himachal Pradesh	0.223	0.247	0.3	0.198	0.183
Karnataka	0.218	0.198	0.229	0.241	0.194
Kerala	0.13	0.127	0.133	0.144	0.102
Madhya Pradesh	0.233	0.29	0.263	0.347	0.263
Maharastra	0.143	0.239	0.236	0.169	0.144
Odisha	0.245	0.136	0.206	0.177	0.22
Punjab	0.145	0.11	0.144	0.102	0.124

Rajasthan	0.21	0.21	0.202	0.179	0.187
Tamil Nadu	0.148	0.174	0.209	0.234	0.182
Uttar Pradesh	0.217	0.221	0.272	0.194	0.274
West Bengal	0.164	0.233	0.153	0.125	0.158

Source: Data taken from RBI Handbook of statistics on state government finances

From the table it is seen that share of capital expenditure in total expenditure in 2002 is highest in Odisha. Then Andhra Pradesh, Madhya Pradesh, Himachal Pradesh, Karnataka, Uttar Pradesh, Bihar, Assam, Gujrat came accordingly. In case of West Bengal, it stands twelfth among the states.

In 2005, share of capital expenditure in total expenditure of Madhya Pradesh ishighest among the states.Then it cameAndhra Pradesh, Gujrat, Himachal Pradesh, Maharastra, West Bengal,Goa, Uttar Pradesh, Bihar, Rajasthan respectively.

In case of Himachal Pradesh, share of capital expenditure in total expenditure is nearly onethird and it is the highest in 2008. Uttar Pradesh, Madhya Pradesh, Gujrat, Goa, Maharstra, Andhra Pradesh came accordingly after Himachal Pradesh. The share of capital expenditure in total expenditure in case of west Bengal is meagre and its position is fifteenth among eighteen states.

In 2011 Madhy Pradesh spent most as share of capital expenditure in total expenditure among the states. Then Gujrat, Karnataka, Tamil Nadu, Bihar, Andhra Pradesh, Goa, Chattishgarh, Himachal Pradesh spent accordingly. In this year West Bengal's performance in capital expenditure is very poor.

Gujrat spent above fifty percent of its share of capital expenditure in total expenditure and it is the highest in 2014. Then Uttar Pradesh, Madhya Pradesh, Bihar, Karnataka, Rajasthan Himachal Pradesh, Tamil Nadu came next. West Bengal's position is eleventh in spending capital expenditure.

From the above findings it is seen that throughout the years Madhya Pradesh has spent more as share of capital expenditure in total expenditure and it performed quite well in increasing its per capita net state domestic product. Whereas state like Punjab spent more revenue expenditure as share of total expenditure and it is now a heavily indebted state in India. Even state like Bihar also spent more capital expenditure and its performance is satisfactory.

4. Results of panel regression and Discussion

Panel regression of per capita net state domestic product (nsdp) at constant prices on the share of revenue expenditure and capital expenditure in the total expenditure of the states has been done. Here waves of data are five rounds. Per capita net state domestic product at constant prices has been used as dependent variable. The share of revenue expenditure and capital expenditure in total expenditure have been taken as explanatory variables for the years 2002, 2005, 2008, 2011 and 2014 in panel regression using 5 waves of data. The results of the panel regression are shown in table 4 and 5.

Table 4. Panel Regression of per capita net state domestic product at constant prices on revenue expenditure of the state governments

Group variable: state

Dependent Variable: per capita net state domestic product (nsdp).

Explanatory Variable: revenue expenditure of the state government as share of total expenditure (sh_rev_exp_cons).

Number of groups (states): 18

Number of observations: 90

Time period: 5

Fixed effects (within) regression

R-sq: within = 0.1946
Between =0.3598
Overall =0.0451

F (1, 71) = 17.15

Prob> F= 0.0001

Exp. Variable	Coefficient	t	p > I t I
Sh_rev_exp - .908221	- 4.4*	0.000	
Cons	11.04538	120.37*	0.000

Random-effects GLS regression:

R-sq: within = 0.1946
Between = 0.3598
Overall = 0.0451

Wald chi2 (1) = 13.20

Prob> chi2 =0.0003

Exp. Variable	Coefficient	Z	p >I zI
Sh_rev_exp- .8387203	- 3.63*		0.000
Cons 11.02149	80.32*0.000		

denotes significant at 1% level.

Hausman test accepts random effects model

So we can say that it has less impact on per capita net state domestic product (nsdp).

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Table 5. Panel Regression of per capita net state domestic product at constant prices on capital expenditure of the state government

Group variable: state
Dependent Variable: per capita net state domestic product (nsdp).
Explanatory Variable: capital expenditure of the state government as share of total expenditure (sh_cap_exp_cons).
Number of groups (states): 18
Number of observations: 90
Time period: 5
Fixed effects (within) regression:
R-sq: within = 0.2338
Between =0.0669
Overall =0.0788
F (1, 71) = 21.67
Prob>F= 0.0000

Exp. Variable	Coefficient	t	p > I t I
Sh_cap_exp.	9462636	4.65*	0.000
Cons	10.12837	2.54*	0.000

Random-effects GLS regression:
R-sq: within = 0.2338
Between = 0.0669
Overall = 0.0788
Wald chi2 (1) = 20.37
Prob> chi2 =0.0000

Exp. Variable	Coefficient	Z	p >I zI
Sh_cap_exp.	9200973	4.51*	0.000
cons	10.14502	55.40*	0.000

Denotes significant at 1% level

In both the cases (Fixed effects model and Random effects model) of panel regression of capital expenditure as share of total expenditure, the coefficients are positive and probability is zero. And also F statistics is high. So it is statistically significant.

Since regression has been done as share of total expenditure of states, per capita net state domestic product has been taken as log form because it is a big number. Expenditures have been taken in three years lag so that the effect expenditure is reflected in income growth. Since the coefficient is positive and significant, it means, if the share of capital expenditure is increased, it helps economic growth through infrastructure development and capital formation. As a result, per capita income increases.

5. Summary and Conclusions

This paper examines the composition of government spending and its impact on per capita net state domestic product (nsdp). There are differences of opinion on revenue expenditure and capital expenditure in the government budget in respect of their impact on growth. In general, growth means gradual rise of per capita net state domestic product. Revenue expenditure means day to day expenditure of government. It includes wages and salaries, subsidy, pension, expenses on administrative services, interest payment on public borrowing etc. whereas capital expenditure generally includes investment for long term growth like-power and irrigation, road and railway communication etc. So the general norm is like that the more and more fund of government budget allocated to capital expenditure the growth will be higher and higher. In this study we have excluded public expenditure like inter-state settlement, contingency fund, small savings, provident funds etc., reserve funds, deposits and advances, suspense and miscellaneous, appropriation of contingency fund and remittances are excluded from capital expenditure as it is in the guide lines of Reserve Bank of India.

The study finds larger share of government spending has been allocated to revenue expenditure in Indian states over the years. We have seen that the expenditure on the development of infrastructure like road, irrigation, power generation telecommunication etc. (capital expenditure) which are lacking in some states is likely to accelerate growth. In this study we have broadly taken two types of expenditures in all forms of government's expenditure- revenue expenditure and capital expenditure. Some so called BIMARU states have been increasing their share of capital expenditure and their per capita net state domestic products (nsdp) are increasing. Since productivity of revenue expenditure is low compare to capital expenditure, economic growth will be lower if more money is allocated to revenue expenditure. The panel regression in econometric analysis based on state level data shows that revenue expenditure has low impact on growth whereas capital expenditure has high positive effect.

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