PUBLIC EXPENDITURE, PRIVATE INVESTMENT AND INCOME: EVIDENCE IN INDIAN STATES

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ABSTRACT

The Fiscal Responsibility and Budget Management (FRBM) Act 2003 was introduced in India in order to reduce revenue deficit by curtailing revenue expenditure. This paper examines the impact of public expenditure by type and nature on the income by constructing new data on combined capital expenditure and combined revenue expenditure of Centre and State governments of 15 major States during the period 1993–94 to 2004–05. This paper finds that, though public expenditure crowds-out private investment, public expenditure of all types and nature positively contributes to state income due to the inclusion of some productive expenditure in the revenue account. All revenue expenditures are not growth retarding, and specifically, infrastructure investment may be used as an instrument by the Central and State governments directly for equitable allocation of private investment to achieve balanced income across states and higher economic growth as a whole.

INTRODUCTION

India is a federal, mixed, liberalised and developing economy. Hence, the private and public sectors (of the Centre and State) and foreign enterprises fill specific roles in the process of growth and the development of the economy. In addition to Central government expenditure, each State government incurs own expenditure for the growth and development of their respective economy defined by the specific geographical areas. It is to be noted that India's fiscal deficit has deteriorated since the mid 1990s and now ranks amongst the worst in the world (Kochhar, 2006). According to the Reserve Bank of India (RBI), the combined gross fiscal deficit of the Centre and the States is hovering around 8 per cent of GDP. The share of states in total combined gross fiscal has increased significantly in the post reform years than in the 1980s. In fact, gross fiscal deficit is led by deficit in the revenue account, which is due to the high expenditure and constrained tax revenue. The Fiscal Responsibility and Budget Management (FRBM) Act was enacted by Parliament in 2003 and implemented on 5th July 2004 which aimed at stabilizing the fiscal status of the Indian economy. One of the important objectives of this Act was to bring down fiscal deficit to 3 per cent of GDP by eliminating revenue deficit by 2008–09. On the one hand, fiscal deficit could not be controlled by implementing this

Act. On the other hand, some revenue expenditures may be productive. Hence, the idea of reducing revenue expenditure may not be ideal for the developing countries.

There are two channels through which public expenditure can affect economic growth. Firstly, the inclusion of public capital as an input in the aggregate production function. Secondly, the effects of public expenditure on regional income by means of its relation with private investment. On the one hand, if public expenditure raises the productivity of private capital and hence the rate of return, private investment will be crowded-in. On the other hand, the increase in un-productive public expenditure raises the tax rate, which negatively affects the rate of return and the inflow of private investment into the state. However, many studies evidenced that inequality in income across Indian States has been increased (Rao et al., 1999; Bhattacharya and Sakthivel, 2004). This imbalance in regional income poses a serious threat to the economic development of India because even small differences in growth rates are cumulated over a long period of time, will have a substantial impact on the standard of living of the people (Barro and Sala-i-Martin, 1995). Hence, the study makes an attempt to understand how different types (and nature) of public expenditure affect State income in India, and, suggests policies to achieve balanced regional growth through direct intervention of both the State and Central governments.

The structure of this paper is as follows. Section II briefly reviews the existing theoretical and empirical studies. Section III discusses the nature and availability of data on public expenditure. In section IV, we provide an overview of public expenditure in the Indian economy. How to construct the combined capital expenditure of Centre and State is discussed in Section V. The methodology and data sources are provided in Section VI. The results of the analysis are described in Section VII. The conclusions and policy suggestions are presented in Section VIII.

REVIEW OF LITERATURE

There are mixed views about the impact of public expenditure on private investment and income, in existing theoretical and empirical literatures. Wagner was the first to establish the relation between public expenditure and economic growth and development. The determinants of public expenditure are discussed in an exhaustive survey by Afzal and Abbas (2010) in examining the applicability of Wagner's Law in the context of Pakistan. According to Wagner's Law, the income elasticity of demand for public goods is greater than unity. This relation was subsequently criticised by Peacock and Wiseman (1967) on the ground that public expenditure may increase with relation to income, but not in the way Wagner hypothesised. However, Keynesians view that government expenditure, as a fiscal policy instrument, is useful for achieving short-term stability and higher long-term growth rate. Therefore, they prescribe government intervention in the economy through fiscal policies due to their stabilising or counter-cyclical role in the development process. They suggest expansionary policies during economic contractions and vice versa for correcting short-term fluctuations and increasing long-term steady State growth rate. Otherwise, the economy will rest at a lower growth trajectory. In contrast, Classical economists reckon fiscal policies to be ineffective as they crowd-out private investment. High government spending directly reduces private spending on education, health, transportation and other services. Further, heavy government spending requiring more

government borrowings may displace the private sector in availing financial resources for its expenditure. This can occur by either squeezing the supply of credit or raising the interest rate in the economy. Gokan (2002) indicated that expenditure may be productive or unproductive but financing methods are likely to retard economic growth depending on the structure of financing, i.e. bonds, money-financing and tax-financing. Higher level of government expenditure financed by debt may deny physical and financial resources to the private sector resulting in lower investment and output. Further, heavy government spending raises taxes at a later stage, which adversely affects the private investor.

Further, it is argued that it is not the volume but the structure or component of public expenditure matters for output and growth of an economy. Barro (1990) said that expenditure on investment and productive activities contributes positively to economic growth because it directly augments capital formation. While current public expenditure provides utility to the households, imposition of higher taxes results in reduction of returns on investments and incentives to the investor. Moreover, this results in inefficient resource allocation with the economy resting on 'an under-equilibrium position'. The provision of public goods, which includes much of government consumption, is likely to have a negative growth impulse. On the contrary, consumption expenditures like defence and administration provide social and political stability, which are essential to attract private investors at the national or sub-national levels. Hence, some consumption expenditures contribute to income or economic growth and reducing such spending would retard growth.

However, private investment is an important channel for the effectiveness of the fiscal policy in terms of increasing growth in the economy. Expansionary fiscal policy can affect private investment in two ways. One, positive and significant effects on private investment (crowding-in) can lead to growth in total income of the country. Two, it increases the rate of interest which leads to crowding-out, i.e. decrease private investment. The existing literatures views are not unique in the context of the validity of the crowding-in or -out hypothesis. While the classical and neoclassical schools advocate crowding-out, the Keynesian model argues that an increase in government spending crowds-in private investment by the multiplier effect. According to the Ricardian Equivalence theorem, increases in deficit financed by fiscal spending will be matched with a future increase in taxes and so they leave interest rates and private investment unchanged (Bahmani-Oskooee, 1999).

Although considerable literature exists on public policy and growth at the national level, the conclusion is mixed in nature (Pal, 2008; Tulsidharan, 2006; Luoto, 2011; Khundrakpam, 2001; Ram, 1986; Gupta *et al.*, 2005; Devarajan *et al.*, 1996; Kweka, 2000; Verma and Arora, 2010; Fölster and Henrekson, 1999; Easterly and Rebelo, 1993). Hence, Grier and Tullock (1989) suggest that the actual relationship between public expenditure and growth is not well understood, therefore, there is need for more empirical research. Further, investment by the Central government and Local government has differential impacts on the economy as evidenced by Miyazaki (2009) in his study of the effect of public investment on macroeconomic fluctuations in Japan. The Central government investments positively influence economic growth while Local government investments exert a negative influence. Lopez (2006) illustrated that productive public investment (i.e. roads, hydraulic infrastructure, urban structures, ports, airports and railways) and social public investment (i.e. education and health) raise the

rate of return of private investment by pushing up productivity in Spanish regions. Moreover, the analyses of effects of public expenditure on income or economic growth at the State level within the country are limited, especially for India. One of the reasons for lack of such study is that relevant State level data in the appropriate form is not available. These studies have analysed the impact of public expenditure on State income in India by only using the components of State public expenditure and ignoring that of the Centre (Ghosh and Prabir De, 1998; Trivedi, 2006, Adabar, 2005; Rajaraman *et al.*, 2001; Jena, 2004). Jena (2004) examines the impact of public expenditure on economic growth at the State level for the period 1980–2000 using the simple pooled panel regression model. Indian States have diverse cultures, infrastructure, natural endowments, etc., which influence their local economic growth—directly or indirectly. Hence, state-specific effect is expected to influence income across the States. Trivedi (2006) examines the impact of human capital along with State's developmental expenditure on inter-State economic growth. Rao *et al.* (1999) examine the determinants of inter-State income by using State per capita public expenditure as a proxy for social and physical infrastructure along with credit extended by all financial institutions as the measure of private investment. Similarly, Ghosh and Prabir De (1998) examine the impact of infrastructure along with per capita plan expenditure on inter-State income. Ahluwalia (2000) examines the determinants of economic growth of State by using plan expenditure as proxy for public investment. However, he argued that though plan expenditure is not identical to public investment (due to paucity of data), the only substitute available was the size of State plan expenditure that relates to the State plan only. Plan expenditure is undertaken by the Central and State governments and what is relevant for the development of a State is the volume of plan expenditure in the State by the Centre as well as the plan expenditure by the State itself.

Therefore, this paper contributes to the literature on regional growth in Indian economy, in the following three contexts: First, the combined public expenditure of Centre and the State by type and nature is constructed to examine its impact on the State income. Second, the crowding-in or -out effect of public expenditure on private investment is captured through its interaction effect on State income. Thirdly, the study addresses the role of private sector investment (by domestic and foreign sources) in the inequality of income across the States. Fifteen major States have been chosen for this study covering the period 1993–94 to 2004–05. These are Andhra Pradesh (AP), Assam (ASM), Bihar (BH), Gujarat (GU), Haryana (HA), Karnataka (KA), Kerala (KE), Madhya Pradesh (MP), Maharashtra (MH), Orissa (OR), Punjab (PN), Rajasthan (RA), Tamil Nadu (TN), Uttar Pradesh (UP) and West Bengal (WB). BH, MP and UP are adjusted due to the partition of the States in 2000. These States account for an annual average of over 90 per cent of the population, 82 per cent of State income and 80 per cent of national private investment in India during this period.

NATURE OF DATA ON PUBLIC EXPENDITURE IN INDIA

Government expenditure typically consists of expenditure on general, social and economic services. Government expenditure is grouped as developmental or non-developmental to assess its welfare impact. Developmental expenditure mainly includes spending on economic services (agriculture, industry, energy, communication, transport,

science, technology and environment) and social services (education, health, employment, nutrition, housing and others). The remaining categories such as government administration, interest payments, pensions, defence and others services constitute non-developmental expenditure. In practice, public expenditure is accounted for under two heads, i.e. current and capital. All consumption expenditure is accounted for in the current account. Capital expenditure includes all possible items of investment— capital outlay on crop husbandry, soil and water conservation, animal husbandry, dairy development, fisheries, forestry and wild life, plantations, food storage and warehousing, agricultural research and education, cooperation, agricultural programmes, major, medium and minor irrigation, command area development programmes, flood control projects, power projects and investment in agricultural financial institutions, and, for other sectors also such as investment for rural development which includes public sector capital outlay on rural health services, rural water supply, rural sanitation services, rural housing, village and small industries, and roads, bridges and civil aviation. In addition to types, public expenditure can be catagorised by its nature, i.e. investment and non-investment or consumption expenditure that has a differential impact on economic growth (Ram, 1986; Aschauer, 1989).

TABLE 1. STATES' CAPITAL EXPENDITURE (in Rs crore)

Items/Years	Reserve Bank of India					India Public Finance Statistics				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Capital Outlay (A+B)	22802	23072	25512	31129	32268	17627	22895	23182	25615	30239
A. Developmental expenditure (1+2)	21839	22258	24397	30228	30978	17532	22773	22979	25237	29986
1.Social & Community Services	3431	4190	4311	5750	5956	3075	3557	4351	4411	5640
2. General Economic Services	18409	18069	20086	24478	25022	780	1108	869	980	1067
B. Non-developmental expenditure	963	814	1115	901	1290	95	122	203	378	253
C. Loans & advances by States (net)	3462	2062	6351	1162	-1383	3797	5091	8047	12176	4485
(i) Loans & advances by States (gross)	10557	11347	15532	11732	12303	9557	10586	11358	15541	11209
(ii) Repayments of States to Centre	7095	9285	9181	10570	13686	5759	5495	3310	3365	6724
D. Discharge of Internal Debt	1048	2567	2666	2246	4190					
Total (A+B+C+D)	41501	46271	52891	55677	62448	21424	27986	31230	37791	34723

Source: Handbook of State Government Finances, RBI (2004) and IPFS (2004).

TABLE 2. COMBINED CAPITAL EXPENDITURE OF INDIA (in Rs crore)

Components	Reserve Bank of India (RBI)					Indian Public Finance Statistics (IPFS)				
	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
Combined Capital Expenditure	58797	64959	75321	77977	93457	48050	59186	66651	60960	70106
Centre Capital Expenditure	51718	62879	48975	47753	60842	27668	34416	40531	35036	44838
States Capital Expenditure	39612	44169	50501	51783	58862	27986	31230	37791	34723	35794
Inter-governmental	32533	42089	24155	21559	26247	7604	6459	11671	8798	10526
Loan & Advances by Centre	34193	44037	24938	23008	34284					
of which to States	29745	39366	21354	18707	24395					
Repayment by States to Centre	7095	9285	9180	10570	13686					

Source: State Finances: A study of Budgets, RBI (2008 and 2004) and IPFS (2004).

The RBI, the Indian Public Finance Statistics (IPFS) and Budget documents of the Government of India (GOI) are the major sources of data relating to public expenditure at national and sub-national levels in India[i]. Neither of them gives estimates of State-wise combined expenditure by State and Centre. They do not match each other except for a few estimates. To understand the nature and components of the above data sources, the all-India capital expenditure of the States' and combined capital expenditure of the States' and Centre for the period 1997 - 2001 are presented in Tables 1 and 2, respectively. From Table 1, the RBI estimates of the States' total capital disbursement at the national level amounts to Rs 52,891 crore, which is very higher than that of IPFS in the year 1999-2000. The difference in the estimation between the two sources is puzzling. According to the RBI, disbursement in the capital account is the sum of capital outlay, discharge of internal debt, repayment of loans to the Centre and gross loans and advances by State governments[ii]. However, the IPFS defined it as the sum of capital outlay and net loans and advances by State governments, while net loans and advances by State governments form the difference between the gross loans and advances by State governments and repayment to States. Hence, the estimation of the States' total disbursement in the capital account is different by definition by the RBI and IPFS. In addition, each component included in the capital expenditure account in the RBI differs from the IPFS. The RBI estimates the total capital outlay as Rs 25,512 crore [developmental (=Rs 24397 crore) + non-developmental (Rs 1115 crore)] in 1999-2000[iii]. The estimate of the States' capital outlay by the IPFS is less than that of the RBI. The States' total capital outlay as estimated by the IPFS is Rs 23,182 crore [developmental (Rs 22979 crore) + non-developmental (Rs 203 crore)] in 1999. Further, the gross loans and advances by State Government are estimated as Rs 15,532 crore and Rs 11,358 crore by the RBI and IPFS, respectively.

The Centre's capital expenditure of RBI does match with the Union Budget Paper of Government of India and not with that of the IPFS (see, Appendix A). The combined capital expenditure is the sum of States' and the Centre's capital expenditure after netting out inter-governmental transfers (IGT). Therefore, the clubbing of the

States' and the Centre's capital disbursement to estimate the combined capital expenditure, using the above definition, does not match between RBI and IPFS.

OVERVIEW OF PUBLIC EXPENDITURE AT THE NATIONAL LEVEL

The combined public expenditure of the Centre and the States is the sum of the combined capital and revenue expenditure. There is an increasing trend in the public expenditure due to an increasing trend in revenue expenditure, while capital expenditure shows a decline during 1993–94 to 2004–05. If capital receipt exceeds capital expenditure it leads to surplus in the capital account, while it is the reverse in revenue account. Except for a few years, i.e. 2000, 2002, 2003 and 2004, the Indian economy experienced overall deficit due to the deficit in revenue account. Pattnaik *et al.* (2010) argued that since 1980s, the pattern in government expenditure has been mainly influenced by a change in the role of the government in the growth process, financing pattern of the deficits (debt and interest payments) and the need for fiscal consolidation. Revenue mobilisation was constrained as well by the need for rationalisation of the tax structure and fixing the tax rates according to the international standards. Hence, the increase in tax buoyancy did not occur despite initiation of tax reforms in the early 1990s in India. Instead, the tax-to-GDP ratio of the Centre declined in the first half of the 1990s. In this scenario, the only way out from the macroeconomic crisis was to undertake an expenditure compression strategy. Accordingly, though the overall size of the government sector (Centre and States) expenditure was more or less stable, capital expenditure showed a steady decline. However, on account of the predominance of committed expenses, curtailment could not take place in revenue expenditure, which led to an increase in the overall deficit in the Indian economy.

TABLE 3. OVERVIEW OF COMBINED FINANCES OF CENTRE AND STATES
(in per cent of GDP at factor cost)

Years	CE	CRE	CPE	CCR	CRR	CTR	CCS	CRS	CS	PUGFCF
1993	5.21	24.16	29.37	8.38	19.55	27.93	3.17	-4.61	-1.44	9.58
1994	5.30	24.19	29.49	9.70	20.17	29.87	4.40	-4.02	0.38	10.24
1995	4.44	23.58	28.02	7.30	20.08	27.38	2.86	-3.50	-0.64	9.02
1996	3.84	23.41	27.25	6.10	19.54	25.65	2.26	-3.87	-1.60	8.18
1997	4.19	23.29	27.48	8.89	18.81	27.70	4.69	-4.48	0.22	7.69
1998	4.02	24.69	28.71	10.66	17.84	28.50	6.64	-6.84	-0.20	7.60
1999	4.22	26.03	30.25	10.79	19.24	30.03	6.57	-6.79	-0.22	8.09
2000	4.05	26.89	30.94	11.45	19.68	31.12	7.39	-7.21	0.18	7.51
2001	4.46	26.67	31.13	11.96	19.08	31.04	7.50	-7.60	-0.09	7.46
2002	3.89	27.28	31.17	11.22	20.07	31.29	7.33	-7.21	0.12	6.61
2003	4.66	26.71	31.38	11.05	20.43	31.49	6.39	-6.28	0.11	6.88
2004	4.84	25.38	30.22	9.48	21.39	30.87	4.63	-3.99	0.65	7.54

Source: Handbook of Statistics on Indian Economy (RBI, 2009).
Note: CCE: Combined capital expenditure, CRE: Combined revenue expenditure, CPE: Combined public expenditure =CCE+CRE, CCR: Combined capital receipt, CRR: Combined revenue receipt, CTR: Combined total receipt (CRR+CCR), CCS: Combined capital surplus, CRS: Combined revenue surplus, CS: Combined overall surplus =CCS+CRS and PUGFCF; public investment.

Public expenditure is used to accumulate capital stock and consumption in public sector. The estimates of public GFCF by Central Statistical Organization (CSO) is presented in the last column of Table 3[iv]. The decline in expenditure in the capital account cuts public investment, which shows a declining trend as well. At the same time, public sector consumption has generally shown an upward trend partly due to the revisions in wages and salaries of Central and State government employees as per the Pay Commission reports. For instance, the impact of the Fifth Pay Commission Award by the Central government could be seen in the rise in spending on wages, salaries and pensions during the end of 1990s. The rise in public consumption and decline in public investment raised some concerns regarding the sustainability of the growth process, particularly in the second-half of the Nineties. Such an outcome in respect of public sector outlays was reflective of the shift in the government's strategy for the development and growth process whereby the role of the government was rationalised so as to allow a greater role for market forces. The increase in government borrowing and monetization of government deficit, however, had serious implications for the overall investment and growth of the economy as manifested by the macroeconomic crisis of the early Nineties. This called for fiscal consolidation, leading to a series of measures in respect of the expenditure as well as the revenue of the government. It may be noted that revenue enhancement was constrained by the need to align tax rates with international standards and fiscal correction mainly came from the expenditure side.

However, none of the official estimates provide State-wise combined expenditure of the States and the Centre. This necessitates estimation of the combined expenditure of the Centre and the States for individual States. The RBI and IPFS provide data on capital expenditure at the national level. The advantage in using RBI data in order to estimate State-wise combined expenditure is that it is the only source which provides data on the State's capital expenditure, the Centre's loans and advances, and repayments to Centre at the State level and originally sourced from the Budget Documents, while the IPFS does not give data on capital expenditure in India.

ESTIMATION OF STATE-WISE COMBINED PUBLIC EXPENDITURE

Combined revenue expenditure is the sum of the Centre and the States' revenue expenditure after netting out of inter-governmental transfers. The inter-governmental transfers in the revenue account are the 'grants' from the Centre to the States minus the interest payment of States to Centre. RBI gives data on combined revenue expenditure (CRE) of the Centre and the States, only Centre's revenue expenditure (CR) at all-India level, State's revenue expenditure (SR), grants from Centre to the State (G) and interest payment of States to the Centre (I) at the State-level. The following steps are used to estimate State-wise CRE.

1. State-wise share of States' revenue expenditure (SR) is calculated.
2. State-wise share of grants from Centre to States (G) is calculated.
3. State-wise share of States 'interest payments' to Centre is (I) is calculated.
4. Grants from Centre to all States (G) are deducted from Centre's revenue expenditure (CR). This is referred to as CR-G.
5. CR-G is distributed on the basis of the average of the shares from steps 1, 2 and 3.

6. Finally, State-wise estimates of CRE are obtained.
7. All India CRE is distributed on the basis of share of estimated CRE of States and presented in Table 4.

TABLE 4. COMBINED REVENUE EXPENDITURE (in Rs crore)

States / Years	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AP	13402	16251	18674	24085	24241	29249	31773	38463	42855	48042	56312	54277
ASM	6972	7708	7992	8460	9307	10646	12817	13144	13867	15995	23592	21084
BH	13016	14163	14767	14308	17889	19978	29329	25197	34493	45555	41945	43473
GU	11750	13232	14484	17429	19991	26416	29905	36645	37248	20021	41563	42025
HA	5071	8680	7909	9978	9958	11211	11480	11822	13700	5936	5715	17264
KA	9826	11738	13353	16021	17164	20672	25161	27199	30054	33594	36812	41028
KE	6736	8384	9215	10643	13078	14749	17626	17884	18435	23980	24223	26827
MP	12114	13285	14824	18102	18907	24117	26722	27824	31412	37236	43889	44193
MH	21238	24360	27421	33074	36034	42245	48799	60111	59517	67005	68949	77826
OR	6336	7535	8514	9376	10570	12738	15174	16942	18269	21107	24008	24970
PN	8406	11778	11293	13100	14490	16623	19138	19759	20430	25151	26489	25616
RA	10205	12321	13996	14864	16744	20866	23651	28382	29759	35218	37486	39164
TN	13449	15365	17111	20250	23120	28141	32292	33888	33581	42284	41329	46252
UP	24297	22384	31925	35058	39280	47948	52726	57813	64646	72048	84276	88622
WB	12542	14437	15926	19192	21315	28850	36529	43098	44309	47082	48182	50976
Total	191384	223824	255457	295167	326504	398984	465102	517618	559511	616840	678019	730405

Source: Author's calculation.

Mallick (2008) estimated CCE at the State-level for the period 1993–94 to 2004–05 by using the definition of RBI as mentioned earlier. RBI estimates all-India combined capital expenditure as well as Centre's capital expenditure (CC) and State-wise capital expenditure of States (SC) only. Mallick (2008) deducted SCE of all States from CCE of all States to calculate the difference between CE and IGT of all States, which is allocated across States on the basis of State's population share. The addition of SE with the estimated difference between CE and IGT gives State-wise CCE. The allocation of CC and IGT on the basis of population share may not be robust. RBI gives estimates of State-wise L and R. Hence, this additional information can be used to produce robust estimates of State-wise CCE.

Therefore, estimate of CCE is modified by considering the following steps.
1. State-wise share of States' capital expenditure (SC) is calculated.
2. State-wise share of Centre's Loans and Advances (L) is calculated.
3. State-wise share of States' repayments to Centre is (R) is calculated.
4. Centre's Loans and Advances to all States (L) are deducted from Centre's capital expenditure (CC). This is referred to as CC-L.
5. CC-L is allocated based on the average of the shares from steps 1, 2 and 3.
6. Finally, State-wise estimates of CCE are obtained.

7.   All India CCE is distributed based on the share of estimated CCE of States and presented in Table 5.

The annual average of 89 per cent of the all-India combined capital and revenue expenditure goes to the major 15 States during the period 1993–94 to 2004–05 (Appendix B). Following Shand and Bhide (2001), the States are catagorised as High performance State economies (HPSE): KA, MH, TN and GU; Medium performance State economies (MPSE): WB, AP, KE, HA, MP and RA; and Low performance State economies (LPSE): OR, PN, UP and BH. In fact, Assam is a low performance State economy. The annual average of per capita combined expenditure by types for the three categories of States are presented for the years 1993–98 and 1999–2004 in Table 6. The CRE in all the HPSE are above the all-India per capita CRE in both periods. Though the per capita revenue expenditure is higher in the less populated States such as HA, PN and ASM, the volume of revenue expenditure is very less compared to the HPSE. However, there is an interesting pattern of combined capital expenditure at the State level in India. The MPSEs are dominating in terms of combined capital expenditure over HPSE and LPSE. Two States out of four in HPSE in 1993–98 are above the all-India per capita combined capital expenditure, while four States out of six in MPSE are above the all-India per capita capital expenditure in 1993–98. One State each in HPSE and MPSE is below the-all India per capita revenue expenditure in 1999–2004. Except the less populated States like PN and HA, the top ranked state is AP followed by KE in terms of the annual average per capita capital expenditure in 1999–2004. This pattern could be due to the significant role of private investment in HPSE.

TABLE 5. COMBINED CAPITAL EXPENDITURE (in Rs crore)

States	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AP	3480	3981	4839	3871	4454	7942	6132	6713	8914	8143	13266	20193
ASM	1701	1779	1879	1503	2429	1613	2559	2043	3935	2377	1597	2116
BH	2170	1803	1906	1903	2204	2092	4701	3653	5780	5315	2361	7847
GU	2335	2889	2936	3130	3671	4384	5264	7383	4436	6416	6126	1723
HA	1052	935	970	1635	1787	2153	1867	2440	2696	1127	2778	5590
KA	2650	2122	2665	2320	2369	3137	3464	3863	4344	5112	6476	9377
KE	1468	1311	1562	1617	2224	1898	1945	1861	2612	2548	4800	6366
MP	2325	2340	2244	2277	3352	2318	2648	3187	4429	5715	7637	10516
MH	4272	7198	5905	5318	6190	5723	11344	6744	6484	5895	7217	2033
OR	1777	1603	1332	1662	1959	2808	2164	3487	3939	3869	2794	3177
PN	2174	2621	2624	1349	2938	5647	4389	3746	4795	3362	5683	3312
RA	2269	2392	3627	3990	5943	3469	4665	3456	4750	5137	6535	8876
TN	2052	2468	2424	3143	3323	3093	2990	3764	4678	4785	7662	11986
UP	4809	7834	5055	5381	6277	6948	8395	8512	102559	116676	23589	25331
WB	1926	2407	2653	3385	2539	2711	4575	6557	7107	4794	11795	13130
Total	41266	49050	48125	48381	58797	64959	75321	77977	93457	88064	118364	139352

Source: Author's calculation.

TABLE 6. PUBLIC EXPENDITURE OF STATES (in Rs crore)

States/Years	1993–98			1999–2004		
	CRE	CCE	CTE	CRE	CCE	CTE
AP	2892	657	3549	5840	1356	7196
ASM	3436	736	4171	6155	903	7058
BH	1619	209	1828	3257	440	3698
GU	3762	706	4468	6693	1020	7713
HA	4685	754	5439	5092	1261	6353
KA	2986	516	3502	6009	1008	7017
KE	3418	549	3967	6657	1034	7691
MR	3467	655	4122	6443	679	7122
MP	2269	335	2604	4222	676	4898
OR	2659	539	3197	5371	868	6239
PN	5617	1284	6901	7561	1361	8921
RJ	2949	719	3668	5566	957	6524
TN	3288	463	3751	6062	942	7004
UP	2126	387	2514	3903	808	4712
WB	2484	347	2831	5525	976	6501
India	2987	550	3538	5663	939	6602

Source: Author's calculation
Note: CRE: Combined revenue expenditure, CCE: Combined capital expenditure, and CTE: Combined total expenditure.

THE METHODOLOGY AND DATA

This study focuses on the impact of the combined public expenditure by type (i.e. current and capital) and nature (i.e., investment and consumption) on State income in India. The empirical analysis includes 15 major States over the period 1993–94 to 2004–05 by using the panel data model, as it controls the individual heterogeneity of the States, has more degree of freedom and efficiency (Baltagi, 2001). In the panel data model, the error term U_{it} is a composite residual consisting of time invariant State-specific components μ_i and captures various characteristics of the State, which are not observable but have a significant impact on the per capita income of the States, and a disturbance term ε_{it}, which is assumed to satisfy the Classical Linear Regression (CLRM) model assumptions.

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

i = 1   15 and t = 1993-94, 1994-95 ...., 2004 - 05.

Y_{it} is income of State, X_{it} is the vector of explanatory variables, α and β are the parameters of the model. The above equation can be modified to capture the expected interaction effect of the explanatory variables on the income of state. Suppose the interaction effect of X_{1t} and X_{2t} influences Y_{it} in the above equation, then the modified equation can be written as follows.

$$Y_{it} = \alpha + \beta X_{it} + \lambda X_{1t} * X_{2t} + \mu_i + \varepsilon_{it}$$

There are three types of panel models. They are (a) pooled regression model (PRM), (b) fixed effects model (FEM) and random effects model (REM). Diagnostic tests such as Breusch and Pagan Lagrange Multiplier (LM) Test and the Hausman (H) Specification Test are used to choose between panel data models. The LM test is used to test the null hypothesis of the non-random individual effect. A high value of LM favours the fixed effect model or random effect model over the pooled regression model. The Hausman specification test is used to test null hypothesis of zero correlation between State-specific effects and the explanatory variables. The significance of the LM test statistics indicates that the models estimated by using REM or FEM give better estimates than PRM. Further, the statistical significance of H test suggests preference for FEM rather than REM. The standard statistical frameworks for estimation of these models are well known (Greene, 2006; Baltagi, 2001).

This paper uses annual data from secondary sources for the period 1993–94 to 2004–05. The estimated revenue expenditure and capital expenditure of the Central and State governments at the State-level are used in the empirical models[v]. Public expenditure is categorised by investment and non-investment expenditure using the State-wise combined capital expenditure. The national public GFCF at constant prices (1999–00) is allocated based on the State-wise combined capital expenditure and is presented in Appendix C. The netting out of public GFCF from total combined public expenditure gives the non-investment expenditure at the State level. All the variables at current prices are converted into constant prices with base year as 1999-00 by using gross state domestic product (GSDP) deflators. The detailed data sources are presented in Appendix D.

The data on private GFCF at the State level is a challengeable issue. Hence, the approach of Mallick (2008) is followed to construct data on domestic private GFCF and private foreign GFCF at the State-level for this paper. Mallick (2008) allocated the national GFCF by using the share of GSDP with the assumption that capital formation depends on the level of economic development. He used two methods to allocate national GFCF across States of India. These are the allocation of national total GFCF (1) by share of aggregate GSDP of States and (2) by the sectoral share. For the second method, national GFCF in primary sector is allocated by each State's share in GSDP of the primary sector of all the States, and the allocation of national GFCF in the secondary and tertiary sectors is estimated based on each State's share in the secondary and tertiary sectors of all States. The GFCF in all the three sectors are added to give the total GFCF of States. Mallick (2008) argued that the second method gives more plausible estimates than the first because the capital output ratio or the investment output ratio vary by the industry. In India, the investment output ratio in the secondary sector is higher than the primary sector during 1993–94 to 2004–05. The estimate of the States' private GFCF at constant prices 1999–00 is obtained by deducting each State's public GFCF from its total GFCF and is presented in Appendix E.

Further, following Mallick (2008), private GFCF at State level is bifurcated into foreign and domestic. He argued that according to the National Accounting Framework in India, foreign direct investments (FDIs) are the net inflows of private foreign investment. The *Handbook of Statistics on Indian Economy (HSIE)* gives the estimates of net inflow of FDI into India. Netting out the net inflows of FDI from the gross domestic capital formation (GDCF) gives the estimates of domestic private investment at the

national level. Due to paucity of data on State-wise FDI net inflows, the approval of the equity component of FDI is used to allocate the national net inflow of FDI across the States[vi]. The private foreign investment at the State level is presented in Appendix F.

The estimates of public GFCF and private GFCF are compared with the estimates of Lakhchaura (2004) to see the robustness as presented in Appendix G.

EMPIRICAL RESULTS

This paper focuses on the impact of public expenditure by type and nature of State income by using the panel data model. Four equations are estimated by specifying all the variables in their level forms in Table 7. Equation 1 estimates the impact of public expenditure by classifying it into revenue expenditure and capital expenditure along with domestic and foreign private investment of States. Equation 2 captures the crowding-in or -out effect by introducing the interaction effect of the aggregate private investment with revenue and capital expenditure in the regression model. Similarly, Equation 3 estimates the impact of public expenditure by nature, i.e. investment and non-investment along with domestic and foreign private investments. The interaction effect of private investment with public investment and non-investment expenditure is introduced in Equation 4. The values of LM (Lagrange multiplier) and H (Hausman) statistics are significant in all the equations. Hence, all equations are estimated using the fixed effect model. Further, the F-statistic for the State-specific coefficients is significant at 1 per cent in all equations. It indicates that the State-specific effects explain the inter-State difference in income of 15 major States over the period 1993–94 to 2004–05 in India.

The results in equation 1 show that both capital expenditure and revenue expenditure of the Centre and the State governments along with foreign and domestic private investments are statistically significant in explaining State income in India. The aggregate of private investment (i.e. foreign plus domestic) is incorporated in equation 2 to capture its interaction effects with capital expenditure and revenue expenditure on States' income. The public expenditure variables along with private investment are found to be statistically significant. It is important that the interaction effects of private investment with capital expenditure and revenue expenditure are negative and statistically significant. It suggests that both types of public expenditure crowd-out private investment at the State level. Hence, it suggests that though both types of public expenditure contribute positively to State income, but they crowd-out private investment. Following, Afonso and Aubyn (2008), such nature of relation among public investment, private investment and economic growth is called 'weakly crowding-out effect of public investment on private investment'. They explored the relation among public investment, private investment and GDP for 14 European Union countries (i.e., Austria, Belgium, Denmark, Germany, Finland, France, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the UK), Canada, Japan, and the United States. They found that public investment has crowding-in effect on private investment and positive effect on GDP for eight countries. Of the nine countries in which there is a crowding-out effect on private investment, four (France, Italy, Japan and the US) still experience a slight output expansion. However, there is strong crowding-out effect of public investment in Belgium, Ireland, Canada, the Netherlands and the UK, where increase in public investment reduces the GDP.

TABLE 7. IMPACT OF PUBLIC EXPENDITURE ON STATE INCOME

Independent Variables	Dependent Variable: Ln GSDP			
	1	2	3	4
CRE	0.85 (6.01)*	0.95 (7.7)*		
CCE	1.17 (3.74)*	3.97 (7.85)*		
PUGFCF			1.12 (4.97)*	3.12 (9.47)*
NPUGFCF			0.86 (6.67)*	1.07 (9.86)*
PRGFCF		2.13 (12.74)*		2.3 (13.6)*
DGFCF	1.25 (11.85)*		1.27 (11.31)*	
FGFCF	4.74 (5.7)*		4.8 (5.69)*	
CAPR		-0.00007 (-6.95)*		
CRPR		-0.000007 (-2.74)*		
PUPR				-0.00005 (-8.3)*
NPUPR				-0.000008 (-3.83)
F-test	610.28*	774.4*	610.8*	806.1*
R^2	0.985	0.989	0.985	0.989
LM-test	86.75*	133.37*	92.6*	181.9*
h-test	98.57*	86.03*	85*	60.47*
State specific Factor (H0: All $u_{i=0}$)	$F_{(14, 161)}$ =43.25*	$F_{(14, 161)}$ =45.8*	$F_{(14, 161)}$ =26*	$F_{(14, 161)}$ =34.7*
No. of observation	180	180	180	180

Source: Author's estimation.
Note: (1) The figures in parenthesis are the t-ratios.* indicates statistically significant at 1 per cent.

  (2) CRE: Combined revenue expenditure, CCE: Combined capital expenditure, PUGFCF: Public investment, NPUGFCF: Public non investment expenditure, PRGFCF: Private investment, DGFCF: Domestic private investment, FGFCF: Foreign private investment, CAPR: Interaction effect of combined capital expenditure and private investment, CRPR: Interaction effect of combined revenue expenditure and private investment, PUPR: Interaction effect of private investment and public investment, and NPUPR: Interaction effect of public non-investment expenditure and private investment.

The results from Equations 3 and 4 present interesting findings. Along with domestic and foreign private investments of States, the impact of investment and non-investment public expenditures on States' income are found to be statistically significant in Equation 3. Similarly, the aggregate of private investment is included in Equation 4 to examine the interaction effect of private investment with the investment and non-investment expenditures of Central and State governments. The interaction effect of investment and non-investment expenditure of Central and State governments with private investment were found to be negative and statistically significant. Hence, the result suggests that both investment and non-investment expenditures contribute positively to State income but crowd-out private investment. Public investment comprises public enterprise investment and general investment including infrastructure investment

on transportation, telecommunication, etc. The negative interaction effect between public investment and private investment could be due to the major role of public enterprises in public investment. Therefore, it crowds-out private investment by reducing the availability of physical and financial resources and increasing the rate of interest for the private entrepreneurs.

The coefficients of revenue and capital expenditures are 0.85 and 1.17, respectively, in Equation 1. It suggests that other things remaining same, one unit increase/decrease in current expenditure leads to 0.85 unit increase/decrease in GSDP. The result from Equation 2 gives the same result as well. The magnitude of change due to capital expenditure is more than that due to current expenditure. Further, the coefficients of investment and non-investment (or current expenditure) of governments are 1.12 and 0.86 in Equation 3, respectively. This indicates that the magnitude of change due to the public investment expenditure is more than due to consumption expenditure of the governments. The same result is found from Equation 4 as well. However, capital expenditure of government is more influential on State income than revenue expenditure, due to its direct involvement in capital creation, which has a positive growth effect on output.

The coefficients of private investment are larger than the capital expenditure in Equation 2 and public investment in Equation 4. It indicates that private investment is more influential on State income than capital expenditure and public investment, which is expected in developing countries. Khan and Reinhart (1990) in the reference list] and Khan and Kumar (1997) evidenced and argued that it was possible because marginal productivity of private capital is more than public capital in developing countries due to market economy reform. This result is also consistent with Afonso and Aubyn (2008), which showed that output elasticity of private investment is higher than output elasticity of public investment for the 14 European Union countries, Canada, Japan, and the United States.

The results from Equations 1 and 3 reveal that foreign private investment is more influential on State income than domestic private investment. This is true in the case of developing countries that face scarcity of capital and lack advanced technology. Blomstrom *et al.* (1994) stated that the technological levels of domestic enterprises in the least developed countries lag far behind in comparison to the enterprises in the developed countries. Multinational firms usually operate at the technological frontier (Findlay, 1978). They are well-equipped with new modern technologies—introducing modern techniques of management and marketing in the host countries—which makes foreign private investment more productive and efficient than domestic private investment. This result is corroborated by De Gregario (1992), who found a positive and significant impact of FDI on economic growth, and, that the productivity of FDI is higher than the productivity of domestic investment in case of Latin American countries.

The study found that all public expenditure (by type and nature) contributes positively to State income. Contrary to the popular belief, revenue expenditure, which is utilized in the most unproductive ways, positively explains the variation in States' income. This finding, to a certain extent, strengthens the findings of earlier studies made by Tulsidharan (2006) in the Indian context and Kweka and Morrissey (2000) in the Tanzanian context and also the results obtained by Devarajan *et al.* (1996) for 43 developing countries. There are some elements in revenue account which are very

productive and the reduction of which may adversely affect the growth of State income. Further, the non-investment nature of public expenditure, which is thought to be unproductive, makes a positive contribution in enhancing State income, which could be due to the fact that a significant part of it is consumed for human capital formation and promoting the welfare of the people which forms the cornerstone of the implications of the theory of endogenous economic growth. The governments should give careful consideration while incurring expenditure because empirical estimates show that both expenditures influence State income. Hence, the study suggests proper classification of expenditure according to the degree of the productiveness and prioritising for incurring expenditure.

However, the effort of the Government of India to reduce the combined fiscal deficit by completely eliminating revenue deficit through FRBM Act 2003 looks confusing. These policy settings may be sound for the economy to eliminate the gross fiscal deficit but may prove dangerous when it targets productive expenditure along with total revenue deficit. It positively influences the per capita income of the States because a part of revenue deficits was found to be capital-creating by nature. In a sense, not all revenue deficits are unproductive. Once revenue deficits are eliminated, if the government targets gross fiscal deficit, some of the productive expenditure will be curbed which is critical to economic growth. Hence, the study suggests the need for a careful policy exercise regarding which expenditure to curb and which expenditure to sustain to achieve higher economic growth.

Private investment is the most crucial factor for the variation of income across States in India. However, the institutions and policies along with the resources, and social and economic infrastructure determine the regional pattern of allocation of private investment (Rao *et al.,* 1999). The Centre and the State governments should design the policies for equitable allocation of private investment to achieve balanced regional income. For instance, the poor States may not be able to afford high infrastructure expenditure to attract private investment. Hence, the Centre can incur higher public expenditure in the poor States to push their income to achieve balanced regional economic growth and maximise national economic growth.

CONCLUSIONS

This paper takes serious note of the increasing trend of combined revenue expenditure that led to an increase in the overall deficit and lack of intuitive study on the impact of public expenditure by type and nature on State income due to the paucity of data at the sub-national level. A panel regression model is devised for the estimation involving 15 major States over 12 years to study the impact of public expenditure by controlling private investment and its interaction effects on State income. This paper constructed the combined public revenue expenditure of the States and the Centre and the combined capital expenditure of the Centre and the States at the sub-national level during the period 1993–94 to 2004–05. The high performance States were found to be incurring higher revenue expenditure than the medium and low performance States. However, the high performance States did not incur as much capital expenditure as the medium performance States. This could be due to the greater role of private investment in the high performance States.

This paper tried to classify the combined public expenditure by type, i.e. revenue and capital, and nature, i.e. investment and non-investment (mainly consumption) expenditure to examine their individual impact on State income. The public and private GFCF (foreign and domestic) at constant prices (1999 – 2000) are estimated following Mallick (2008). The modification of the combined capital expenditure of the Centre and the States at the sub-national level gives more robust estimates of public GFCF and private GFCF than Mallick (2008). The revenue expenditure along with capital expenditure, private investment (both foreign and domestic) and State-specific factors are significant to the variations in State income. The positive impact of revenue expenditure on State income contradicts the general belief that it negatively affects output and economic growth. This could be due to the presence of some productive expenditure in the current account. Consistently, the non-investment expenditure along with the investment of the public sector, private investment and State-specific factors are also significant in explaining the variation in income across States.

The significance of investment in the disparities in the incomes among States was found out from the fact that private and public investments consistently have a positive impact on State income. Even private investments by both sources, i.e. domestic and foreign, were found to have a positive impact on State income during the economic reform years. Private investment was found be more influential on State incomes than public investment due to the higher productivity of the former in the reform based economy as empirically shown by Khan and Reinhart (1990), Khan and Kumar (1997) and Afonso and Aubyn (2008). Further, foreign private investment is more influential on State incomes than domestic private investment due to higher productivity and efficiency than the latter as argued by Blomstrom *et al.* (1994), Findlay (1978), and De Gregario (1992).

Public expenditure is seen to be crowding-out private investment as it is reflected in the significant negative interaction effects of revenue expenditure, capital expenditure, investment expenditure and non-investment expenditure with private investment. This crowding-out effect of public investment on private investment may not follow the interest rate mechanism in the context of the Indian states due to the uniform rate of interest across all the states. It can be stated that crowding-out effect is, to a large extent, due to the domination of enterprise investment over infrastructure investment of the public sector as evidenced by Krishnamurthy (1985), Parker (2000) and Shankar (1997) at national level for India. However a study by Bruckner and Tuladhar (2010) also found the crowding-out effect of the local government expenditures on private investment at the prefecture (District) level in Japan during the period 1990–2000. Infrastructure investment directly and positively contributes to income. But on the other side, it also affects indirectly by crowding-in private investment, which is very crucial for output and economic growth. Therefore, balanced regional income or economic growth can be achieved through equitable allocation of investment expenditure on infrastructure across the States. The policy should be designed in coordination with the Centre and the States to increase infrastructure investment expenditure at national level and to allocate it equally across the States instead of simply targeting reduction in revenue expenditure with policies like the FRBM Act 2003, though some productive expenditures are contained in revenue account.

APPENDICES

APPENDIX A. CENTRE'S CAPITAL EXPENDITURE (in Rs crore)

Year	Budget Document	RBI	IPFS
1993	33684	33684	33190
1994	38627	38627	32294
1995	38414	38414	34504
1996	42074	42074	34534
1997	51718	51718	27668
1998	62879	62879	34416
1999	48975	48975	40531
2000	47753	47753	35036
2001	60842	60842	44838
2002	60769	60769	27134

Source: Budget Documents of India, IPFS and RBI.

APPENDIX B. COMBINED EXPENDITURE (in %) of MAJOR AND MINOR STATES

Year/States	CRE		CCE	
	Major	Minor	Major	Minor
1993	91.63	8.37	89.44	10.56
1994	90.08	9.92	89.78	10.22
1995	89.02	10.98	89.07	10.93
1996	89.42	10.58	88.24	11.76
1997	89.46	10.54	88.1	11.9
1998	88.84	11.16	88.01	11.99
1999	88.82	11.18	88.97	11.03
2000	88.52	11.48	86.99	13.01
2001	88.04	11.96	85.67	14.33
2002	87.58	12.42	86.9	13.1
2003	89.20	10.80	93.21	6.79
2004	88.12	11.88	94.39	5.61
Average	89.06	10.94	89.06	10.94

Source: Author.

APPENDIX C. PUBLIC GFCF (in Rs crore at 1999–00 prices)

States	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AP	10503	11281	12892	8880	8702	13979	10919	11639	14149	12848	17217	23214
ASM	3683	4367	4597	3227	3932	2582	4254	3298	5409	3949	2054	2451
BH	6356	5212	5355	5084	4744	5324	8250	6889	8577	8602	3129	9207
GU	6624	7873	8080	7833	7494	9064	8920	12641	7279	9630	8107	2067
HA	2931	2682	3200	3764	3416	4048	3076	3948	3718	1729	3590	6407
KA	7328	6573	6913	5847	4666	6061	5941	6708	7226	8038	8407	10824
KE	4252	3984	4254	3805	3960	3560	3280	3157	3822	4204	6192	7399
MP	6341	6265	5822	5683	6517	4983	5050	4908	5472	7216	6137	7539
MR	12235	18652	15414	14050	13045	12588	17588	10614	8801	8876	9315	2371
OR	4860	4351	3706	4069	3975	5273	4236	6073	5893	6738	3529	3742
PN	6922	7306	6429	4071	5541	9518	6951	6008	6629	4858	7302	3805
RA	6329	6675	9427	9349	10574	6911	8126	5792	6518	8023	8575	10255
TN	6376	7709	6508	7730	6410	5922	5185	6505	6621	7184	9877	13748
UP	13819	22405	14335	14182	13275	15098	15249	14801	15105	18097	30357	29289
WB	6145	7932	8362	9565	7182	8752	7979	11022	10214	8130	15212	15202

Source: Author

APPENDIX D. DATA SOURCES

Variables	Data Sources
GFCF by industry of use in the economy	National Accounts Statistics, CSO.
GFCF by industry of use in the public sector	National Accounts Statistics, CSO.
GSDP	EPWRF (2009)
Combined capital expenditure of States' and Centre	Handbook of Statistics on Indian Economy (RBI, 2009)
Combined revenue expenditure of States' and Centre	Handbook of Statistics on Indian Economy (RBI, 2009)
State-wise Capital and revenue expenditure	State Finances: A study of budgets, RBI.
State-wise capital formation in 1993–94 to 1999–2000 at current prices	Lakhchaura (2004)
Net Inflow of FDI into India	Handbook of Statistics on Indian Economy (RBI, 2009)
FDI approvals of states	Secretariat for Industrial Assistance (SIA), Government of India

APPENDIX E. TOTAL PRIVATE GFCF(in Rs crore at 1999–00 prices)

States	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AP	9878	11641	13165	17311	17935	15683	22245	20920	21638	24793	24783	27371
ASM	1028	811	906	2165	1421	2900	2001	2785	1406	3254	5876	7217
BH	6296	8808	8976	8906	12521	12908	11526	12583	11224	13683	20001	19621
GU	13467	15635	21077	23678	24502	25839	28445	21520	28903	30801	40470	58613
HA	4782	5863	6642	6638	7414	7625	10001	8952	10384	13295	13636	15177
KA	7441	9819	12169	14175	17134	19372	21216	20305	22222	23359	27315	33286
KE	5226	6730	7789	7957	8030	9796	12127	12211	12623	13640	14351	17554
MP	11495	13007	16417	16727	17661	21124	24681	20746	22621	20523	26828	32519
MH	34492	30547	46321	47927	53373	55702	58737	56394	62921	69536	81008	108801
OR	1205	2462	3894	2751	3475	2669	5152	2485	3353	2799	7749	10411
PN	3046	3430	5763	8232	7545	4749	8751	8851	9075	11379	10576	19877
RA	5492	7570	7007	7402	8571	13438	14715	14851	16020	14347	19108	22876
TN	16915	19207	25671	24861	27531	29753	34357	33018	32193	34153	35341	38234
UP	15674	10692	22527	25095	25968	25712	29606	51061	57316	60185	60265	56172
WB	13033	13260	16380	15552	19492	20656	25817	22140	26486	31927	29248	38275

Source: Author.

APPENDIX F. FOREIGN PRIVATE INVESTMENT (in Rs crore at 1999–00 prices)

States	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
AP	102	210	145	407	865	687	440	1370	608	1062	1177	2316
AS	0	0	0	0	0	0	0	0	0	0	0	1
BH	11	5	6	22	22	66	141	12	28	1	2	4
GU	199	289	139	394	937	985	263	824	5717	2090	1613	3399
HA	34	61	79	177	199	124	172	47	304	830	522	71
KA	34	164	485	928	1056	1552	890	1732	1824	4236	1540	2595
KE	6	3	30	90	9	34	85	209	178	91	194	544
MP	123	101	74	546	1182	372	445	106	64	186	3	152
MH	850	1019	718	1184	1597	1362	2449	5806	5571	4023	3871	4415
OR	154	95	269	494	1060	107	51	31	211	0	0	5
PN	34	129	79	140	132	29	6	12	14	256	1351	1437
RA	33	66	31	129	361	34	56	64	153	606	25	67
TN	182	256	455	768	1090	961	751	2018	1291	1752	1519	1234
UP	19	59	223	339	97	125	187	245	590	334	247	52
WB	204	722	328	341	103	125	208	347	590	334	247	59

Source: Author

APPENDIX G. ROBUSTNESS OF ESTIMATES OF GFCF

This section compares the estimated public GFCF with that of Lakhchaura (2004). The comparison uses the following steps.

i. Ratio of Lakhchaura estimates of State-wise public GFCF to national public GFCF is calculated.

ii. Ratio of associated estimates of State-wise public GFCF to national public GFCF from NAS is calculated.

iii. The simple correlation coefficient between the above two ratios are presented in the following Table.

The simple correlation coefficients range from 0.65 to 0.84 from the period 1993–94 to 1999–2000 and statistically significant, while comparing estimated public GFCF with Lakhchaura. It is important to notice that the correlation coefficients are higher than Mallick (2008) for most of the years. This indicates that the estimated public GFCF by using the generated combined capital expenditure of this study are more reliable and robust than Mallick (2008).

Further the above three steps are used to compare the reliability of estimated private investment with Lakhchaura. The correlation coefficients are found to be statistically significant and ranged between 0.80 and 0.98. In addition, the correlation coefficients are higher than Mallick (2008) for all the years.

CORRELATION COEFFICIENTS OF ESTIMATES WITH LAKHCHAURA

Years	Estimated		Mallick (2008)	
	Public GFCF	Private GFCF	Public GFCF	Private GFCF
1993	0.65*	0.94*	0.64*	0.933*
1994	0.65*	0.90*	0.65*	0.885*
1995	0.76*	0.95*	0.747*	0.944*
1996	0.77*	0.98*	0.758*	0.971*
1997	0.81*	0.94*	0.819*	0.934*
1998	0.66*	0.82*	0.715*	0.794*
1999	0.84*	0.80*	0.864*	0.8*

*Note: * indicates statistically significant at 1 per cent level.*

ENDNOTES

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[i] The data sources on public expenditure in India are: (a) Indian Public Finance Statistics (IPFS), Government of India, (b) Handbook of Statistics on Indian Economy (HSIE), RBI (2009), (c) State Finances: A Study of Budgets, RBI, (d) Combined Finance and Revenue Accounts of Union and State GOI, (e) Civil Accounts in Comptroller and Auditor General (CAG), (f) State Finances Accounts in CAG, (h) Finance Accounts of Union Government in CAG, (i) Budget paper of various States, and (j) Budget paper of GOI.

[ii] RBI estimation treats the repayment to State government as receipt in the revenue account.

[iii] The year 1999 refers to the financial year from April 1999 to March 2000.

[iv] CSO estimates national level public GFCF by classifying each and every item in the budget document according to the economic classification (like salary, wages, purchase of goods and service, building outlay, machinery outlay, transfer, etc.) and purpose classification (like agriculture, manufacturing, construction, trade, etc.). On the basis of the description of individual items, the expenditures on formation of fixed assets like building, roads and bridges, other construction, machinery, transport equipment, etc., are clubbed together to get the estimate of government sector GFCF from the capital account. Further, some of the revenue items in the budgets are classified as GFCF in the national accounts, if they are of the nature of capital expenditure like purchase of computers, etc., under office expenses. Similarly, some items of current expenditure nature in capital account of budgets are classified as revenue expenditure if they do not meet the criterion of fixed assets, such as money spent on routine maintenance and repairs.

[v] Capital expenditure and revenue expenditure at the State level are referred to as the combined expenditure of the Centre and the State governments in this analysis.

[vi] Following the definition of the RBI, FDI includes equity capital, reinvested earnings and other capital.

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