

## Does Composition of Government Budget Matter to Economic Activity?

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### Abstract

This paper provides an analysis of India's comprehensive government budget components (state plus central government) and their impact on three activity variables, namely, the private sector investment, private consumption expenditure and export performance. The results have some important but indicative policy prescriptions. First, the fiscal policy geared towards direct taxes for generating revenue rather than indirect taxes is likely to generate greater output effect. Second, decentralisation of expenditure process appears to induce greater output level as compared to centralised expenditure. And third, the so called "capital expenditure" in the government budget or the "development expenditure" does not promote investment spending by the private sector indicating the need for greater care in implementing capital expenditure.

### 1. Introduction

The current literature on the effects of fiscal stimulus is focused on analysing its growth consequences. Often, such analyses introduce a chosen variable to proxy fiscal stimulus and test its effects on overall economic growth. For example, Devarajan, Swaroop and Zou (1996) classify government expenditure as 'productive' and 'unproductive' and report public spending to have negative effect on economic growth in the developing economies. Referring to the past studies they note that "neither economic theory nor empirical evidence provide clear-cut answers to the question of how the composition of public expenditure affects economic growth" (p. 314).

Recently, Bose, Haque and Osborne (2003) going a step further introduce budget constraint into the specification seeking to assess the impact of capital expenditure relative to total expenditure on economic growth. Even sector specific growth implications of government spending have been examined (see Fan, Hazell and Thorat, 1999 for the case of agriculture).

Another strand of economic analysis is that of the macroeconomic models in which aggregate output includes government spending. In particular (at least in India) government expenditure forms a significant proportion of service sector output and hence variations in government expenditure have a direct impact on the output of service sector and indirectly on the overall output of the economy. Government also expends resources on construction activity, irrigation facilities, power plants and laying electricity transmission lines. Generally captured as investment spending, these expenditures are also part of overall output.

However, government policy actions can be analysed more meaningfully by developing an understanding of historical response of the private sector and external sector to the fiscal policy stances with respect to budgetary components. Surprisingly, the question of the impact of composition of government expenditure and instruments of revenue generation on macroeconomic variables such as private sector investment, private sector consumption and export performance has not found much attention in literature. Analysis of this type would provide better insights of an economic and could help in designing policy.

There is considerable merit in arguments that government spending on building basic infrastructure for the economy or in building health and education facilities can lead to higher economic growth. In a similar vein the revenue decisions should aim at reducing distortions attributed to tax system and at the same time provide adequate revenues to finance government expenditure. However, in a democratic society, sectoral allocation of

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spending get guided by the perception of sectoral priorities and the electoral compulsions, while the choice of revenue instruments are influenced by the need for raising the quantum of revenue.

In such a situation it is important to evaluate and quantify the effects of high levels of indirect taxes and perverse effects of high levels of government spending on efficient allocation of resources to enrich policy discussion. Would it lead to more private investment if government spending were directed more and more towards capital outlay rather than current expenditures that provide administrative services? Would shifting of tax revenues towards direct taxes rather than indirect taxes lead to a greater impact on private investment and consumption expenditure?

Cross-country comparison indicates a mixture of policy options with respect to tax instruments (Table 1). With liberalisation of trade regime, taxes such as the custom duty are converging across countries yet there is considerable variation in the structure of taxes. Such variations provide implementable competing alternative policy options and therefore, adequate knowledge of transmission mechanism to private sector behaviour is valuable.

Table 1: Tax and revenue structure of Central Governments in selected countries

	Tax revenue (% of GDP)	Taxes on goods and services (% of value added of industry and services)	Taxes on goods and services (% of current revenue)	Taxes on income, profits and capital gains (% of current revenue)	Taxes on international trade (% of current revenue)	Social security taxes (% of current revenue)	Other taxes (% of current revenue)	Total tax revenue as percentage of current revenue
<u>1990</u>								
India	10.1	7.4	36.1	15.0	28.8	0.0	0.5	80.4
United States	17.4	0.7	3.2	51.6	1.6	34.6	1.1	92.1
New Zealand	35.9	13.2	27.1	53.1	2.1	0.0	3.1	85.4
Canada	18.6	4.0	16.7	51.2	2.8	16.0	0.0	91.8
South Africa	24.3	10.3	33.6	50.8	3.6	1.8	2.4	92.5
China	4.0	1.5	17.6	31.2	13.8	0.0	0.0	83.6
<u>2001</u>								
India	10.0	5.6	29.2	28.6	18.5	0.0	0.2	76.4
United States#	20.2	0.8	3.2	57.5	1.0	30.0	1.4	93.9
New Zealand	28.4	-	26.9	64.1	1.73	0.0	1.1	93.8
Canada	19.3	-	16.5	52.4	1.3	21.2	0.0	91.4
South Africa	26.5	10.8	32.6	54.2	2.9	1.8	3.5	95.2
China*	6.8	6.5	74.5	6.4	9.5	0.0	3.6	94.0

Source: World Bank (2003) \* 1999 data, # 2000 data

In Table 1, two main features, which distinguish India from the rest are low dependence on income tax in raising current revenue and high share of international trade taxes<sup>3</sup>. However, changes are taking place in the Indian context also to move in the direction of higher share of direct taxes and lower rates of taxes on international trade.

The fiscal reform and stabilization programs in India following the 1991 crisis have focused on bringing overall government expenditure levels within the limits of revenue and borrowing capacity of the government without adversely affecting private sector's productive activities while raising the productive potential of the economy. This has led to changes in the composition of government expenditure and its sources of revenue in India that are largely 'policy driven'. Perceived fallout of such changes in fiscal stance is expected to affect private sector decision about consumption and investment as also the export performance of the economy either in short run or in the long run or both, which is an issue for empirical scrutiny. This paper is an attempt to examine such issues.

<sup>3</sup> The fiscal data in Table 1 covers only Central government finances. Despite this limitation, we believe that a comparative international comparison is valuable.

In this context, it is important to examine whether the changes in the composition of government budget that has occurred over time has had any significant impact on the overall level of economic activity. More specifically, the aim of this paper is two-fold:

- To examine the impact of composition of government expenditure and revenue on overall economic activity via the impact on aggregate private capital formation, private consumption expenditure and exports.
- To assess whether there is a causal relation between composition of government revenue and expenditure on the selected macroeconomic aggregates

The two objectives are inter-related, and to some extent the second objective is subsumed in the first. However, the second objective states the relationship between composition of government budget and the overall economic activity more clearly. The rest of the paper is organised as follows: The following Section 2 discusses a simple conceptual framework in order to compare the theoretical expectations of the impact of government's fiscal actions on investment and consumption. Section 3 presents the historical movements in goal variables and components of government budget in India. This is followed by an econometric analysis in Section 4. Summary of results and conclusions are presented in section 5.

## 2. Conceptual Framework

The key elements of 'Washington Consensus' on development policies refer to fiscal discipline, privatisation of state enterprises and indicating generally a reduction in the role of government in favour of increasing dependence on market mechanism. On the other hand several economists, based on the Keynesian paradigm or other structural reasons, argue that since market failures in developing countries are common, government role must be emphasised. However, there is little doubt that private agents do factor in government actions while taking inter-temporal consumption (C) and investment (I) decisions. Therefore, fiscal policy is likely to remain significant variable in explaining macroeconomic outcomes.

Arguments in favour of market forces are based on the requirements of a business environment, which motivates private investment and sustains economic growth. In this context, non-productive government expenditures such as subsidies to public sector enterprises producing marketable goods, the government borrowings to finance such activities contribute to weakening of business environment. Economists also differ on the effects of taxes and its composition on the real activities, importantly the consumption and investment.

The main conceptual arguments can be summarised within the framework of the stylised Classical and Keynesian models. The impact multipliers of fiscal stimulus are derived in an illustration of the two alternative positions at the end of this paper<sup>1</sup>.

The predictions of responses of investment to government expenditure and tax are entirely opposite in the case of Keynesian and the classical framework. On the contrary, both models predict similar responses of consumption to changes in taxes. More specifically, Keynesian framework predicts pro-cyclical<sup>4</sup> effect of government expenditure (G) on investment and consumption and this counter-cyclical response to taxes, while classical framework predicts pro-cyclical (counter-cyclical) response of investment (consumption) to taxes (T) and counter-cyclical response of investment and consumption to government expenditure. The key reason behind such contradiction is the fact that Keynesian framework is demand driven while classical framework is supply driven. Keynesian framework assumes excess labour supply and allows monetary and fiscal policy to influence output, while classical assumes guaranteed full employment at market clearing wages.

The impact multipliers derived in the 'endnote' from the stylised constructs are summarised in Table 2.

Table 2. The impact multipliers for the stylised cases of Classical and Keynesian Systems

Type of stimulus	Classical Prediction	Keynesian Prediction
$\delta I/\delta T$	Positive	Negative
$\delta I/\delta G$	Negative	Positive
$\delta C/\delta T$	Negative	Negative
$\delta C/\delta G$	Negative	Positive

<sup>ii</sup> The term 'Pro-cyclical' is used to imply positive association between the two variables considered here and the term 'Counter-cyclical' implies negative relationship.

Note: The algebraic derivations are at the end of the paper.

The multipliers reported above, incorporate both direct and indirect effects of the initial stimulus. For example, while the higher interest rate resulting from higher government expenditure (the standard LM curve) has a negative impact on investment (IS curve), the overall effect of higher government expenditure on investment, as the IS curve shifts out, is positive under Keynesian framework. But under Classical framework, the impact on private investment is negative because government expenditure crowds out private expenditure. In the case of the impact of taxes on investment, the positive effect of a rise in taxes on investment in the Classical system results from higher savings induced by lower consumption. The Keynesian system, however, precludes full adjustment as prices and wages are not flexible.

The crowding out effect of unproductive government expenditure on private investment is widely tested in empirical literature (Barro 1990; Devarajan, Swaroop and Zhu 1996). In contrast, Aschauer (1989) using data from the United States for 1949-85 demonstrates strong positive relationship between productivity and the ratio of public investment and private capital stock. Literature is also critical about the way the empirical equations are formulated leading to specific results (Gemmell, 2004).

Interestingly, models under the Real Business Cycle framework also, which are dynamic in nature predict a counter-cyclical response of consumption to government expenditure. In such models the increase in government expenditure leads to fall in expected wealth by increasing the households lifetime tax liability (negative wealth effect). Further, since the rise in government expenditure is not permanent, agents also respond by decreasing their capital holdings.

In more recent work, both tax and expenditure side fiscal stimulus to growth has been formally analysed using endogenous growth theory (Barro (1990), Barro and Sala-i-Martin (1999), Cashin (1995)). These analyses concentrate on the final outcome of growth rather than consumption and investment.<sup>5</sup>

The investment decisions are also affected by the way government tries to finance its expenditure. Even in the case of value-added tax (VAT), which is considered to be non-distortive, the implementation could lead to a distorted VAT. There are issues regarding effects of direct and indirect taxes, resulting equity problems, cost of collection and double taxation in distorting the business environment. Custom duties are reduced in order to harness benefits of trade and goods and services taxes are reduced to increase consumption. While indirect tax applies uniformly across all sections of people, income tax has flexibility to differentiate between rich and poor and could be calibrated to achieve some kind of equity. In fact goods and services tax can deprive the poor even with income tax exemption from enjoying several goods and services, which otherwise she could have enjoyed in absence of such taxes. Also, goods and services tax can bring in distortions in the production process and investment decisions particularly when quantum of these taxes is high and changes are made frequently. However, in a developing country, it may be comparatively easier to collect indirect taxes.

Providing an overview of the channels by which fiscal policies may affect economic growth, Gemmell (2004) lists the following:

- The production externalities: for example via the impact of public infrastructure provision on private investment
- Productivity growth: through the effect of fiscal policy on Research and Development
- Productivity differences: the differences between public and private sector provide opportunities for growth through reallocation of the resources
- Effects on factor accumulation: fiscal policy can influence investment in physical or human resources
- Crowding out: within the resource constrained scenario, public spending can crowd out private spending

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<sup>5</sup> See Bleaney., Gemmell and Kneller (2001) and Gemmell (2004).

- Redistribution: policies that aim at redistribution of income and wealth can affect growth through a number of channels such as altering saving rates, providing social insurance etc.

Although the above arguments are couched in the context of the impact of fiscal policies on growth, the implications in a static setting would also be similar. In other words, while the Classical or Keynesian paradigms indicate the aggregate responses of economic activity variables to fiscal stimulus, either revenue or expenditure, there are a variety of channels by which activity levels could be affected.

The impact of fiscal stimulus in terms of changes in aggregate government expenditures or taxes, therefore, cannot be predicted unequivocally based on simple theoretical constructs. There is a valid reason for proceeding to examine the issue empirically. The implications are even less clear if we consider composition of fiscal stimulus. Therefore we proceed to examine the implications of composition of fiscal stimulus on the economy in an empirical setting.

### 3. Trends in Economic Activity and compositional Features of Government Budget

Before we proceed with the analysis of the impact of government budgetary features on the economy, we review briefly the trends in these features and the overall economic activity. The fiscal stimulus is transmitted to the overall economy via the response of the private sector. To capture the impact on overall economic activity, we choose private gross capital formation, private final consumption expenditure and exports as the indicators. While the choice of investment and consumption variables is more obvious for assessing the impact of the overall fiscal policy variables, we have included exports in the analysis because of the plausible impact of overall fiscal policies on exports and because of the latter's growing importance in the economy. Although non-tax measures such as quotas and controls ruled India's trade until the 1990s, the fiscal policies affected costs and prices and therefore, also trade.<sup>6</sup> In the case of exports, we examine the impact of budget composition on two measures of exports: merchandise exports alone and merchandise plus non-factor service exports. Given the rising importance of service exports in recent times, it is meaningful to examine the impact of fiscal operations of the government on total exports. The composition of government budget can be seen in terms of the (a) ratio of development expenditures to non-development expenditures, (b) ratio of non-interest revenue expenditures to capital outlay and (c) ratio of direct taxes to indirect tax revenue. To further refine the concept of revenue expenditure of the government we use 'government final consumption expenditures' rather than merely revenue expenditure net of interest payments in an alternative definition of item (b) above. In the present analysis we choose the total government expenditures, that is, the budget accounts of Centre plus States so that bulk of the government expenditures in the economy is taken into account.

The choice of budget composition variables is dictated by availability of data in the sense that the classification of expenditures into 'development' and 'non-development' is readily available and the classification has the connotation of development expenditures being pro-development and hence pro-growth in comparison to non-development expenditure. These data are available only for the period from 1980-81 onwards.

Ideally allocation of government expenditure into capital expenditure and current expenditure would have provided the distinction between investment expenditure and current expenditure with the former directly influencing growth by creating capital for producing higher level of output. To capture this distinction, we have defined the following variables:

$$\begin{aligned}
 \text{Non-interest Revenue Expenditure} &= \text{Centre's Revenue Expenditure} \\
 &- \text{Grants to States} \\
 &- \text{Interest Payments by the Centre} \\
 &+ \text{Revenue Expenditure of the States} \\
 &- \text{Interest Payments by the States} \text{-----} \quad (3.1)
 \end{aligned}$$

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<sup>6</sup> The impact of fiscal variables on private capital formation and consumption can occur via the complementary or substitution linkages between government expenditures and the former. The macroeconomic interactions may further influence the outcome via the interest rate or exchange rate effects. In the case of exports the linkages may be mostly indirect as we consider here the overall fiscal variables rather than those relating to exports directly.

Capital Outlay = Capital Outlay of the Centre + Capital Outlay of the States ---- (3.2)

The rationale for subtracting grants to the states in (3.1) above is that the revenue expenditures (RE) financed by such grants are already included in (3.1). The interest payments are subtracted from the RE of both the Centre and States as these are determined mainly by past patterns of expenditure and revenue and their levels cannot be influenced significantly by the budgets.

At best the 'capital outlay' variable defined above captures the components of government expenditure that go directly towards creation of physical capital. It does exclude loans and advances by the Centre and States. But it is only a proxy for investment spending by the government. Another item of capital expenditure such as loans and advances also go towards financing investment expenditures by other agencies of the government or by the rest of the economy. However, this is not the sole use of these funds and hence we have not included them under 'investment expenditure'.

To examine the impact of composition in terms of current and capital expenditure, we have used the following alternative proxy for the current expenditure: 'government final consumption expenditure' from the National Accounts. Although this is not entirely satisfactory specification, it has the merit of excluding the transfer payments.

On the revenue side, we have defined two sets of variables to capture variation in the composition:

TAX = (Gross Tax Revenue of the Centre + Own Taxes of States) --- (3.3)

NON-TAXREV= (Non Tax Revenue of Centre – Interest Payments by States on  
Loans from the Centre + Non Tax Revenue of States  
- Grants from the Centre to States) ----- (3.4)

DTAX = (Gross Direct Tax Revenue of the Centre  
+ Own Direct Tax Revenue of States) ----- (3.5)

INDTAX = (Gross Indirect Tax Revenue of the Centre  
+ Own Indirect Tax Revenue of States) ----- (3.6)

The indirect taxes constituted bulk of the tax revenue in India's tax revenues, as the tax base for personal income taxes was extremely narrow. The direct taxes are more equitable but difficult to apply in the developing economies and hence indirect taxes have been the main source of revenue for the government. The adverse distortionary effects of high levels of indirect taxes are well known. Therefore, implicitly, a higher ratio of direct taxes to indirect taxes would provide a better environment for the choice of sectors for investment. All the data for the present analysis are from Reserve Bank of India (2004).

Table 3 summarises the trends in the various measures of economic activity and composition of government budget for the period of 1970s and up to the current period. The trends in overall economic activity as reflected in the average growth rates of real GDP (GDPFC\_R), gross capital formation of the private sector (GCFPVT\_R), total capital formation GCFTOT\_R (inclusive of public sector) and real private final consumption expenditure (PFCE\_R) show an acceleration in the pace of economic activity in the 1980s and 1990s over the levels of 1970s. The real merchandise exports (EXPT\_R), however, show a deceleration in growth in the 1980s over the previous decade but register a higher growth rate again in the 1990s. The merchandise plus commercial exports (MCSEXP\_R) show faster growth than the merchandise exports taken alone in all the three decades, but in general follow the same trend as the merchandise exports. The government final consumption expenditures (GFCE\_R) also show faster growth in the 1980s relative to the previous decade.

The period of early to mid 1990s was particularly a period of relatively rapid period of growth. The GDP, private sector capital formation, PFCE\_R and exports recorded the highest rate of annual growth during this period as compared to all other sub-periods considered in Table 3. However, the growth of PFCE\_R was slower than the rate of growth in GDP during all the periods after the 1970s.

The period stretching from 1970-71 to 2002-03 considered here includes periods of slow growth and relatively rapid economic growth, which enables one to compare this with the experience of variations in government budget composition.

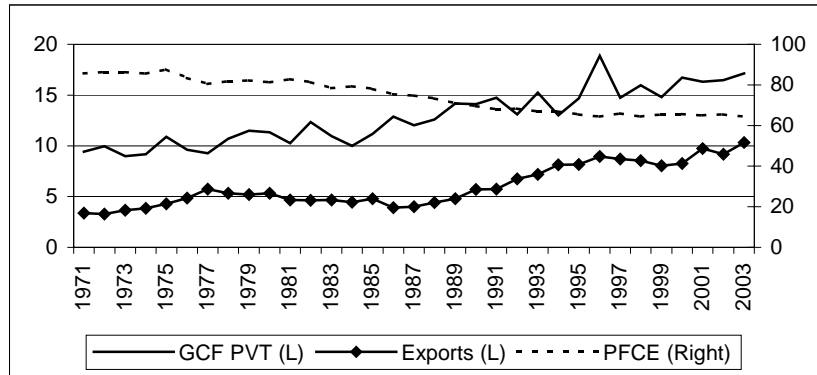
Table 3. Trends in Economic Activity and Composition of Government Budget: Centre plus States

Variables	Period Averages				
	1970s	1980s	1990s	1992-93 1996-97	1997-98 to 2002-03
Growth rates % per year					
GDPFC_R	2.87	5.85	5.77	6.69	5.25
GCFPVT_R	3.41	7.35	10.10	12.00	9.51
GCFTOT_R	3.62	6.72	6.95	8.48	6.31
PFCE_R	2.74	4.70	4.73	5.14	4.50
GFCE_R	4.90	6.92	6.32	4.66	6.38
EXPT_R	8.66	7.10	9.84	12.19	8.69
MPCSEXP_R	9.10	7.46	11.09	11.17	11.43
Ratios %					
GCFPVT/GDPMP	10.15	12.05	15.18	15.31	16.24
PFCE/GDPMP	83.90	76.45	66.19	65.98	65.09
GFCE/GDPMP	9.72	11.21	11.44	10.96	12.25
EXPT/GDPMP	4.61	4.60	7.84	8.22	9.01
MPCSEXP/GDPMP	5.12	6.15	10.16	10.31	12.78
DEV/NDEV	NA	186.23	128.35	127.88	110.08
NINT/CAP	354.21	385.88	592.02	576.36	676.72
DTAX/INDTAX	24.81	20.26	28.54	28.52	35.29
GEXP/GDPMP	NA	28.22	26.57	26.07	27.21
TAX/GDPMP	16.67	19.36	18.86	19.03	18.33

Note: GDPFC = GDP at factor cost; GDPMP = GDP at market prices; The suffix R indicates that the variable is in constant prices (real); in other cases the variable is in current prices.

Figure 1a provides an illustration of trends in the selected economic activity variables in relation to overall GDP. The average ratio of GCFPVT to GDP increased in the 1980s over 1970s and again in 1990s over the previous decade. Thus, private investment was recording sustained increase during the period of previous three decades. The PFCE, on the other hand, was declining as a ratio to GDP over time. The decline was less sharp in the 1990s than in the 1980s. The drop in PFCE relative to GDP indicates a rise in household savings. As income levels increased the propensity to save increased leading to slower increase in PFCE. The extent to which the changes in government budget composition were responsible for this will be examined in this analysis.

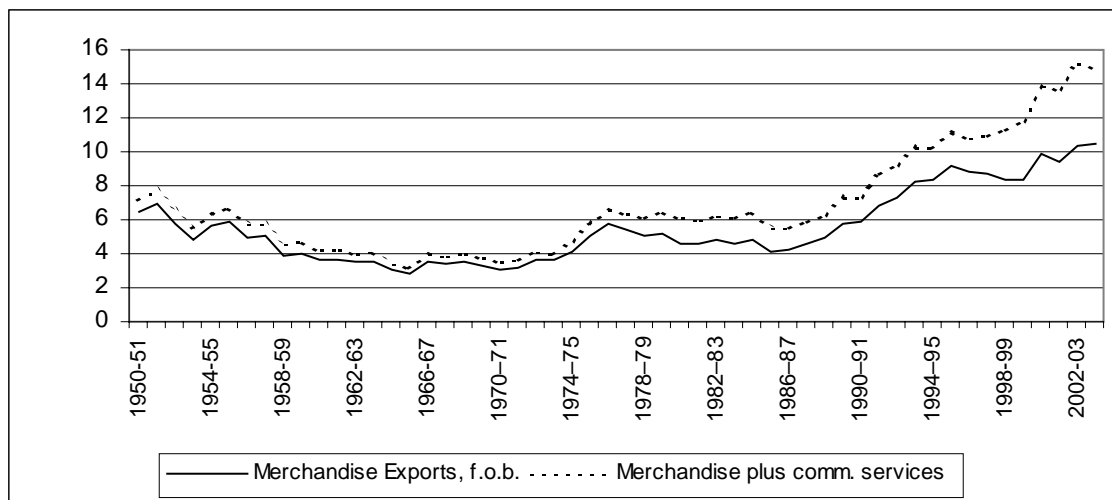
Figure 1a. Trends in Economic Activity: investment (GCFPVT), exports and consumption expenditure as % of GDP at market prices



The exports show a different trend in the 1980s as compared to the trends in the other activity variables: the growth is slower in the 1980s over the growth achieved in the 1970s. This pattern holds for merchandise exports alone as well as for merchandise plus commercial service exports (Figure 1b).

The pattern of changes in the composition of government expenditure during the period of 1980-81 to 2002-03 is shown in Figure 2. The development expenditure declined relative to non-development expenditure. Even after removing interest payments from the non-development expenditures and using capital outlay as a proxy for investment spending out of the budgetary resources, the trend towards current expenditure<sup>7</sup> in the budget is clear from Figure 2a. The average ratio of development to non-development expenditures is shown to decline from about 186 percent in the 1980s to about 110 percent during 1997-98 to 2002-03 (Table 3).

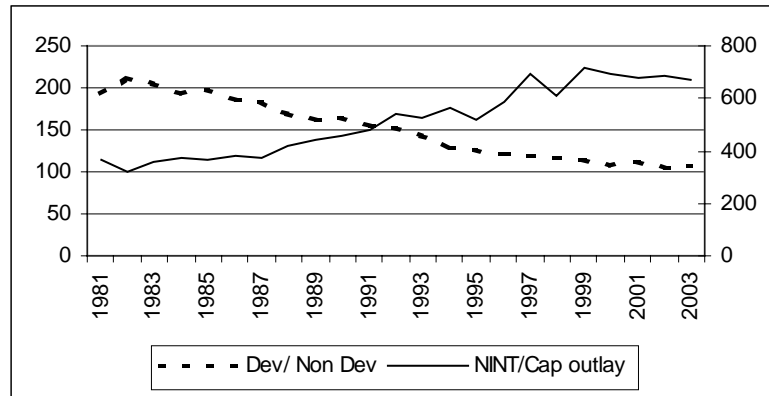
Figure 1b. Trends in Exports: Merchandise and Merchandise plus Commercial Services (as % of GDPMP)



The ratio of non-interest revenue expenditure to Capital Outlay increased from 354 percent in the 1970s to 677 percent during 1997-98 to 2002-03. In other words the higher growth in private investment and consumption expenditure occurred when the budget expenditures were shifting away from capital expenditure to current expenditure.

<sup>7</sup> Capital outlay includes equity assistance to PSUs, which in the 1990s turned to markets for capital support. In this context the rise in the ratio of current expenditure to capital outlay upto late 1990s highlights the growing prominence of current expenditure in the budget.

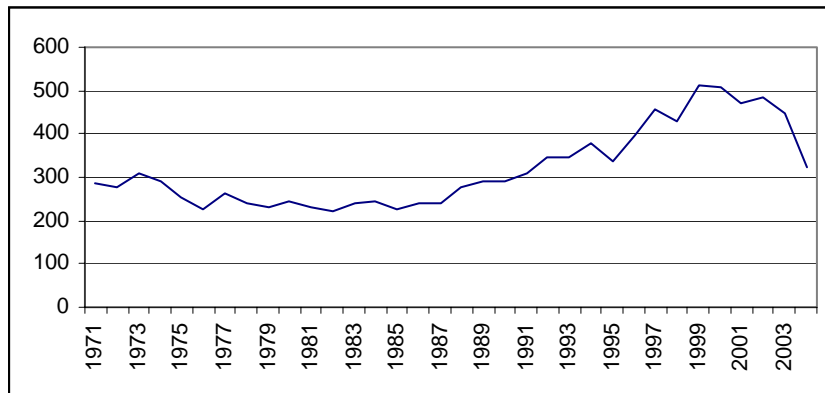
Figure 2a. Trends in the composition of government expenditure (Ratios as %):  
Centre plus States



Note: NINT/ Cap Outlay is on right axis and Dev/ Non Dev is on left axis.

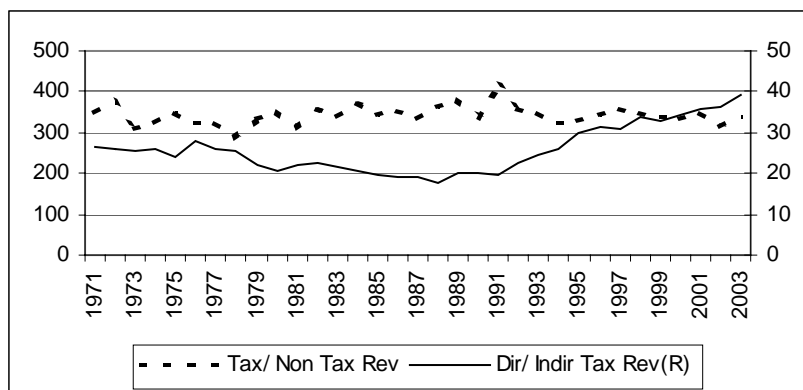
We have examined the pattern of changes in government consumption expenditure relative to capital outlay. As shown in Figure 2b, the consumption expenditure rose faster than capital outlay during the period of the 1980s and 1990s. Only in the first three years of the first decade of the 21<sup>st</sup> Century the consumption expenditures have begun to decrease relative to capital outlay.

Figure 2b. Trends in the composition of government expenditure (Ratios as %): Government Final Consumption Expenditure/ Capital Outlay



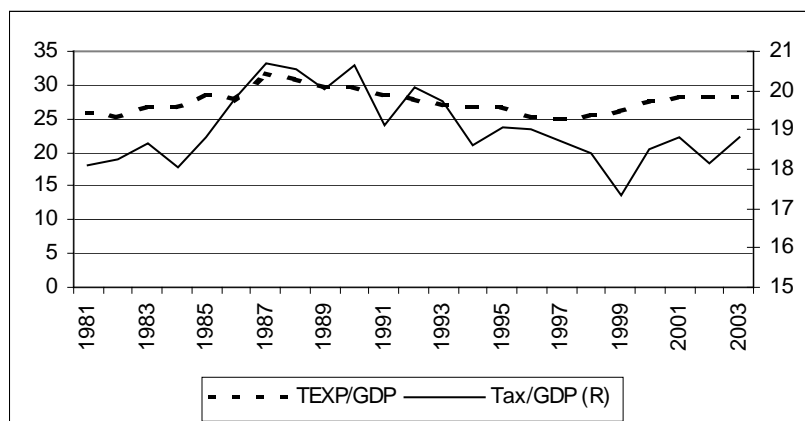
The changes in expenditure patterns were also accompanied by changes in the composition of revenue. The changes in the composition of tax revenue were sharper than the broad composition of revenue receipts.

Figure 3. Trends in the composition of government revenue receipts (Ratios as %):  
Centre plus States



The steady decline in the ratio of direct tax revenue to indirect tax revenue was reversed in the 1990s. Direct taxes were about 40 percent of the indirect tax revenue by 2002-03 from less than 20 percent in the mid 1980s. Tax revenues have remained more dominant of the two sources revenue: tax and non-tax. The non-tax revenues have shown some increase relative to tax revenues in the 1990s.

Figure 4. Trends in Government Expenditure and Revenue (Centre plus States): as % of GDP



While the composition of expenditure as well as revenue of the government witnessed significant changes over the period of the 1970-2002, the aggregate levels of revenue and expenditure also recorded a rise. During the period of economic reforms and adjustment, the gap between government expenditures and tax revenues has widened

The above brief review of trends in government expenditure and revenue and selected indicators of economic activity indicates fairly significant changes over the pervious three decades. The changes in government budget composition may be partly due to the initiatives requiring additional expenditures (on the expenditure side) or the need to meet rising expenditures (on the revenue side). The impact of these changes on economic growth may be influenced by other factors as well. In this paper, we attempt to provide an assessment of this impact.

#### 4. Econometric Analysis

There can be alternative approaches to the empirical assessment of the relationship between the composition of government budget and macroeconomic activity. One approach would be to specify a full-fledged macroeconomic model and examine the impact by tracking the various transmission mechanisms. An alternative approach that we adopt, is to examine a reduced form type specification in a regression model. The latter approach does have the limitation that it is unable to distinguish between different transmission mechanisms by which the fiscal stimulus influences activity variables. But it does provide an assessment of the overall impact for a given structure of the economy<sup>8</sup>. The basic regression model incorporating the above relationship can be expanded to assess both the short-term and long-term effects through an error correction model (ECM), which also circumvents some of the time series problems such as non-stationarity of variables.

The basic framework of the ECM for the two-variable case can be specified in a simple model as follows:

$$\Delta Y_t = a_0 + a_1 \Delta Y_{t-1} + a_2 \Delta X_t + a_3 \Delta X_{t-1} + \lambda (Y - b X)_{t-1} \quad \text{--- (4.1)}$$

Where

Y = variable representing economic activity: Private investment, Private consumption expenditure and exports.

X = variable representing selected component of government budget

<sup>8</sup> Lack of an implicit structural relationship does imply that we are unable to distinguish between a 'supply-constrained' and a 'demand-deficient' condition of the economy. However, since the Indian economy continues to be constrained by supply constraints especially in physical infrastructure, the findings are of relevance. We have attempted to examine if the findings vary when we include the period of the 1970s in the analysis along with the years of 1980s and 1990s.

The above specification can be expanded to include more variables and additional lags in order to capture conditional impact of the competing variables in budget composition on economic activities. Although length of the lag can be determined by statistical criteria, given the number of observations available, we have limited our analysis to the use of two lags.

A formulation incorporating one conditioning variable and two lags can be as follows:

$$\Delta Y_t = a_0 + a_1 \Delta Y_{t-1} + a_2 \Delta X_t + a_3 \Delta X_{t-1} + a_4 \Delta X_{t-2} + a_5 \Delta Z_t + a_6 \Delta Z_{t-1} + a_7 \Delta Z_{t-2} + \lambda (Y - bX - cZ)_{t-1} \quad \text{----- (4.2)}$$

Or following Hendry (1995) more generally,

$$\Delta Y_t = a_0 + a_1 \Delta Y_{t-1} + a_2 \Delta X_t + a_3 \Delta X_{t-1} + a_4 \Delta X_{t-2} + a_5 \Delta Z_t + a_6 \Delta Z_{t-1} + a_7 \Delta Z_{t-2} + b_1 Y_{t-1} + b_2 X_{t-1} + b_3 Z_{t-1} + \varepsilon_t \quad \text{----- (4.3)}$$

Where

$\varepsilon$  = random residual term,

X and Z form pair of competing policy variables, or one of them is a policy variable<sup>9</sup> and the other a conditioning variable, while Y is the chosen goal variable. This point is of relevance as Bose, Haq and Osborne (2003) point out ignoring government budget constraint in assessing the impact of government expenditure on economic growth may result in misinterpretation of the estimated coefficients.

The long-term effect or impact multipliers are

$$\beta_1 = -(b_2/b_1)$$

$$\beta_2 = -(b_3/b_1) \text{ and}$$

The short-term effects or impact multipliers are

$$\phi_1 = (a_2 + a_3 + a_4)/(1 - a_1) \text{ for X and}$$

$$\phi_2 = (a_5 + a_6 + a_7)/(1 - a_1) \text{ for Z and}$$

We note that the above specification also allows us to test short run causality between X and Y. If both coefficients  $a_3$  and  $a_4$  are not significantly different from zero then there is no causality from X to Y. Similarly, if both coefficients  $a_6$  and  $a_7$  are not significantly different from zero then there is no causality from Z to Y.

In addition, a significant long-run relationship in equation 4.3 would indicate causal direction from X (and/or Z) to Y in the sense that any disequilibrium from the long run relationship would drive the value of  $\Delta Y$  to adjust towards the long-term path.

Therefore, the above specification provides a comprehensive assessment of the relationship between the policy variable(s) and the economic activity variable. We adopt the above specification to examine the relationship between budget composition and economic activity for the Indian data set. We test for the stationarity of the residual error term to ensure that the system is stable<sup>10</sup>. The equations are estimated using ordinary least squares.

Two different time periods are considered in the assessment of the impact of the budget variables on economic activity: 1981-82 to 2002-03 (Period I) and 1971-72 to 2002-03 (Period II). The second period covers the entire period of three decades that includes the moderate reforms of the 1980s and the more sweeping economic reforms of the 1990s, along with the period of slow economic growth in the 1970s. The first period of 1981-82 to 2002-03 covers the two decades in which the economic growth was more rapid than in the previous decade. All the variables are taken as fraction of gross domestic product at current market prices<sup>11</sup>.

<sup>9</sup> The term 'policy variable' is applied here in a loose sense only to reflect that policies can influence these variables more directly than the activity variables.

<sup>10</sup> We also test for the unit roots of the variables. All the variables are either I(1) or I(0).

<sup>11</sup> The normalization that we adopt has two justifications. One is that although Government budgets are framed in absolute values, there is always an underlying relation to the 'expected' level of economic activity and the GDP is such a measure of economic activity. Second, this normalization captures the point that 'government's budget constraint' needs to be taken into account while assessing the impact of either the

## Revenue Composition and Economic Activity

The budget documents aggregate revenue collections under stylized sub-groups. Important sub-groups for the aggregate revenue include tax and non-tax revenue; while tax itself is classified as direct and indirect taxes. Therefore, we first examine aggregate tax revenue against non-tax revenue and then go into further detail to scrutinize relative effectiveness of direct and indirect taxes on aggregate private investment, consumption and exports.

### (a) Tax Vs Non-tax Revenue

During the recent years, the Government of India (GOI) as well as State Governments have emphasized the role of non-tax revenues, particularly to meet expenditures for creating infrastructure. During 1980s, administered pricing mechanism for infrastructure, steel and fuel was important sources to supplement revenue mobilisation. Later, during 1990s and subsequent years, dividend from the profit making public sector enterprises and disinvestment proceeds became important source of additional revenue for the government<sup>12</sup>. We examine the impact of tax revenue Vs non-tax revenue on economic activity within the framework outlined above. We consider only consumption and investment variables as the goal variables for this analysis.

The results in terms of direction of the long-term and short-term impact are summarised in Tables 3a and 3b below. Details of estimation are reported in Annexure Table A1.

Consider the long-term effects first (Table 3b). The revenue aggregates defined as tax revenue and non-tax revenue do not show significant impact on private capital formation in either of the two periods. However, the non-tax revenue has significant negative relationship with the private final consumption expenditure in period I but not in period II. Tax revenue in either of the two periods has no significant effect on private consumption. None of the experiments reveal significant short run effects (Table 3a).

Table 3a. Short-term impact of the revenue composition on economic activity: tax Vs non-tax revenue

Economic Activity Variable	Tax Revenue	Non-tax Revenue
Private Capital Formation-PI	Negative	Negative
Private Capital Formation- PII	Negative	Positive
Private Final Consumption Expenditure- PI	Positive	Positive
Private Final Consumption Expenditure- PII	Positive	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

Table 3b. Long-term impact of the revenue composition on economic activity: tax Vs non-tax revenue

Economic Activity Variable	Tax Revenue	Non-tax Revenue
Private Capital Formation- PI	Negative	Positive
Private Capital Formation- PII	Negative	Positive
Private Final Consumption Expenditure- PI	Negative	Negative*
Private Final Consumption Expenditure- PII	Negative	Positive

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

The taxation rules in India allow tax exemption for a considerable proportion of output, particularly those produced in agriculture, informal sector and many of the services. Therefore, it is possible that the effects of aggregate taxes do not reflect on aggregate goal variables.

Nevertheless, we expect taxed sectors to work as conduits between policy and rest of the economy. We note that the tax revenue has a negative impact (sign of the coefficient) on investment and consumption in the long-run in

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revenue measures or the expenditure measures. For instance, the GDP variable captures the impact of revenue measures on expenditure arising from the budget constraint if the GDP is affected by the government's expenditures.

<sup>12</sup> Disinvestment receipts are part of capital receipts. Ability to target and achieve the targets for PSU profits and dividends on the part of the government may be weak. In this sense, the actual policy instruments may be different from the variables we examine here although the latter are important indicators of fiscal policy.

both the periods considered, although the impact is not statistically significant in any of the formulations but the implications need not be undermined. In other words, the tax revenue may have an adverse effect, though we are unable to find a significant relationship. In fact, the findings from short-run causality test substantiate our expectations.

There is evidence of causality running from tax revenue to private capital formation (Annexure Table A1) during both the periods, which suggests that raising revenue from taxes rather than non-tax sources leads to lower consumption expenditure and lower investment in the short-run (causality tests) but this impact may not prevail in the long-run. In fact non-tax revenue has negative impact on private consumption spending in the long run. In both the cases, tax and non-tax revenue, we have two broad categories of revenue. The impact of sub-categories of these revenue items on private sector activity may vary. We examine the impact of sub-components of tax revenue in the next section. The negative impact of non-tax revenue on consumption can arise from the sources of such revenue. For instance, if the revenue were realised from higher administered prices, then private consumption would be adversely affected.

### (b) Tax Composition and Economic Activity

As noted earlier, various governments chose different composition of tax revenue from income and output. India has traditionally relied more on indirect taxes as compared to direct taxes due to various reasons, probably the ease of collection being the most important reason. Empirical literature analysing the relationship between tax rates and output has shown both positive and negative relation depending on the state of the economy (business cycle) and the level of tax rate: at higher level of tax rate, a rise in tax rate may affect the output adversely as compared to the case of tax rate rising from a lower level. We have examined this relationship taking aggregate direct and indirect tax collections in the economy. Since the tax revenue variables are expressed as a ratio to GDP at current market prices, they also represent direct and indirect tax rates. Although they are not the ex-ante tax rates, nevertheless over a period of time, they represent the effective tax rates<sup>13</sup>. As noted earlier, the economic activities represented by private capital formation, private final consumption expenditure and exports are also expressed as a ratio to GDP at current market prices in the present analysis.

We summarise the results of estimation in Tables 4a and 4b in terms of direction of the impact and its statistical significance. We focus here only the direction of the impact rather than the level of impact. The results with respect to causality are presented in Table 5. Detailed Tables are in the Annexure Table A2.

First consider the long-term impact of direct taxes. Holding the indirect taxes constant, the impact of direct taxes is significantly positive on capital formation and significantly negative on final consumption expenditure as predicted by the classical model. With increasing direct taxes, disposable income falls and the resulting contraction in consumption rate leads to higher saving rates and hence more capital for investment. The impact of indirect taxes is also almost the same as the effect of direct taxes: negative on consumption and positive on capital formation. The short-term effects do not show clear pattern. In the case of exports the short-term effects vary depending on whether we take merchandise exports alone or exports of goods and services together. The divergence may be partly related to the tax exemptions to some of the major services sectors.

Table 4a. Short-term Impact of Taxes: direct vs. indirect taxes

Economic Activity Variable	Direct Tax	Indirect Tax
Private Capital Formation: PI	Negative	Negative
Private Capital Formation: PII	Negative	Negative
Private Final Consumption Expenditure: PI	Positive	Positive**
Private Final Consumption Expenditure: PII	Negative***	Positive
Exports: PI	Positive*	Negative*
Exports: PII	Positive**	Negative

<sup>13</sup> Clearly, a rise in the ratio of direct tax revenue to GDP can come from expansion of tax base and better collection effort rather than from higher 'tax rate'. What we observe here is the ratio of actual collection of revenue to GDP. In this sense, the actual policy instruments that lead to the fiscal outcomes such as higher ratio of direct tax to GDP are different from those used in the present analysis.

Total Exports: PI	Negative***	Negative**
Total Exports: PII	Negative**	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII. Total exports = Merchandise plus commercial services

Thus, both components of tax revenue have similar impact on consumption and capital formation, but the size of the impact varies because of which the composition may matter.

Table 4b. Long-term Impact of Taxes: direct vs. indirect taxes

Economic Activity	Direct Tax: Long-term Effect	Indirect Tax: Long-term Effect
Private Capital Formation: PI	Positive ***	Positive ***
Private Capital Formation: PII	Positive ***	Positive ***
Private Final Consumption Expenditure: PI	Negative***	Negative***
Private Final Consumption Expenditure: PII	Negative***	Negative***
Exports: PI	Positive ***	Negative
Exports: PII	Positive ***	Positive
Total Exports: PI	Negative	Negative
Total Exports: PII	Positive	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII. Total exports = Merchandise plus commercial services

The absolute size of the coefficients of long-term effects is larger in the case of direct taxes than the indirect taxes (see Annexure Table A2). In other words, a rise in direct taxes relative to GDP leads to larger decline in consumption expenditure than the rise in indirect taxes. Similarly, direct taxes motivate more investment than the indirect taxes.

Therefore, if the ratio of direct taxes rises relative to indirect taxes, then the ratio of private final consumption expenditure to GDP would decline and the ratio of private capital formation to GDP would rise. If the ratio of direct taxes to indirect taxes declines then (private consumption expenditure/ GDP) would rise and (Private capital formation/ GDP) would decline.

Table 5. Causality from Tax Revenue Composition to Economic Activity

Economic Activity	Direct Tax to Activity	Indirect Tax to Activity
Private Capital Formation (PI)	Prevails*	Prevails **
Private Capital Formation (PII)	No evidence	Prevails **
Private Final Consumption Expenditure (PI)	No evidence	Prevails***
Private Final Consumption Expenditure (PII)	No evidence	Prevails *
Exports (PI)	No evidence	Prevails*
Exports (PII)	No evidence	No evidence
Total Exports (PI)	Prevails***	Prevails***
Total Exports (PII)	Prevails***	Prevails***

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII. Total exports = Merchandise plus commercial services

This is important and has an intuitive explanation. Indirect taxes make production process distorted and inefficient, which impede production in short run. On the other hand direct taxes appear to motivate savings and investment and lead to long-term benefits. An alternative explanation can be that on the basis of discriminatory tax policy between exporters and other, whereby exporters save taxes and import duties and then invest to further increase exports, while tax rates in general keep rising.

As in the case of investment and consumption, on exports also the impact of direct taxes is greater than the impact of indirect taxes. In other words, the rise in direct taxes is likely to influence exports much more than the rise in indirect taxes. The composition again matters.

The findings on causality, however, are less clear-cut. The evidence on causality from direct taxes to economic activity is actually found in only one case: for private capital formation in Period I. On the other hand, causality from indirect tax to economic activity is found in almost each of the cases examined except for exports

(merchandise) during period I (Table 5). These findings suggest that changes in indirect taxes are likely to lead to changes in economic activity.

The findings of this analysis are important in policy formulation. Although, the results are not very clear and unequivocal, from the viewpoint of sustaining output growth, direct tax is shown to be a better instrument as compared to indirect taxation and tax to be better than non-tax sources for raising revenue with positive implications to output.

### Composition of Government Expenditure and Economic Activity

Analysis of the impact of composition of expenditure has to rely mainly on different classification schemes currently in vogue. However, the available schemes are likely to be influenced by the importance attached to different classes of expenditure in the accepted schemes of classification. For example, 'development expenditures' may be viewed with higher priority and hence there may be an effort to include expenditures under this head even when the implication of such expenditure may not be 'development'. Since it is beyond the scope of this paper to develop a new classification of expenditure, we note this limitation of analysis at the outset.

#### (a) Development Vs. Non-development Expenditure

The government expenditure has often been considered in terms of development expenditure and non-development expenditure. We examine the implications of this classification on economic activity. For this purpose we choose only private capital formation and private consumption as the activity variables. Further, expenditure under these classifications are available only from 1981-82 and therefore, the analysis is presented only for the period I. Tables 6a and 6b provide the summary of short-term and long-term effects of expenditure, respectively, on private capital formation and consumption (details in Annexure Table A3).

Table 6a. Short-term Impact of Composition of Government Expenditure: Development Vs Non-development Expenditure

Activity Variable	Development Expenditure	Non-development Expenditure
Private Capital Formation	Positive	Negative
Private Final Consumption Expenditure	Positive	Positive

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table

Table 6b. Long-term Impact of Composition of Government Expenditure: Development Vs Non-development Expenditure

Activity Variable	Development Expenditure	Non-development Expenditure
Private Capital Formation	Negative ***	Positive ***
Private Final Consumption Expenditure	Negative	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table

The government expenditures under either of these two classes have no significant effect on consumption. On the other hand, there are significant long run and short run effects on investment. The non-development expenditure has a significant and positive impact on private capital formation unlike the development expenditure, which has a negative impact on private capital formation in the long run.

From the point of view of fiscal stimulus, this suggests lack of complementarities between development spending (including that on infrastructure) and private investment<sup>14</sup>. These findings are, nevertheless, in line with the results of Devarajan, Swaroop and Zou (1996) where they report that public spending on investment in developing countries is negatively related with GDP growth but the current spending is positively related to growth.

<sup>14</sup> The financial support to public sector investment expenditure is only a part of such investment spending. The recent trend of greater reliance by the PSUs on the market for their capital requirements further reduces the significance of budgetary support for investment. To distinguish the effects of public investment in infrastructure rather than other sectors, it would be more appropriate to consider public sector investment rather than only budgetary support.

The results on causality indicate that non-development expenditures have a causal relationship with private capital formation whereas development spending has no such impact (Annexure Table A3).

Thus, non-development expenditures have the causal and positive impact on private capital formation relative to GDP. The composition of government expenditure measured in terms of development and non-development has an impact on private investment but in a very surprising direction: more non-development expenditure has a positive influence on private investment. The results support both Keynesian as well as classical views but only partially.

#### (b) Revenue Expenditure and Capital Outlay

Another measure of composition of government expenditure that captures the consumption and investment orientation of the budget is the ratio of revenue expenditure to capital outlay. We make an adjustment in the revenue expenditure by subtracting the interest payments to get the non-interest revenue expenditures of the government, which adjusts for a main item of transfer payments.

The analysis does not indicate any significant impact of this classification of expenditure on the private final consumption. However, government's capital outlay is found to be negatively associated with private capital expenditure and the latter is positively associated with revenue expenditure in the long-run (Table 7). Again, these findings are in line with those of Devarajan, Swaroop and Zou (1996). Nevertheless, it can also be argued that capital outlay through government programs may not be enough to influence private sector capital formation. The negative relationship in the long-term captures the relative decline in capital outlay over time while the private capital formation has been on the rise. It is also possible that reducing capital outlay by the government reduces crowding out and increases private investment. However, this does not mean that government should abandon investments in infrastructure. In fact it may point to the substitution between private and public investment in infrastructure

In the context of findings relating to the impact of revenue expenditure, it can be argued that higher revenue expenditure may produce demand pressures leading to an increase in private capital formation more prominently than the supply side effects of capital formation through budgetary means.

Table 7a. Short-term impact of expenditure composition on economic activity: non-interest revenue expenditure Vs. capital outlay

Activity Variable	Non interest revenue expenditure	Capital outlay
Private capital formation: PI	Negative	Negative
Private capital formation: PII	Negative	Positive
Private Final Consumption Expenditure: PI	Positive	Negative
Private Final Consumption Expenditure: PII	Positive	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

Table 7b. Long-term impact of expenditure composition on economic activity: non-interest revenue expenditure Vs. capital outlay

Activity Variable	Non interest revenue expenditure	Capital outlay
Private capital formation: PI	Positive**	Negative***
Private capital formation: PII	Positive***	Negative***
Private Final Consumption Expenditure: PI	Positive	Positive
Private Final Consumption Expenditure: PII	Negative	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

The test of causality from budgetary expenditure composition (revenue Vs Capital Outlay) to private capital formation suggests that there is no evidence of causality from capital outlay to private capital formation but revenue expenditure has a causal relationship with private capital formation (Annexure Table A4). The same pattern of relationship holds even when we consider government final consumption expenditure and capital outlay: causality prevails with GFCE but not with capital outlay.

Table 7c. Short-term impact of expenditure composition on economic activity: government final consumption expenditure Vs. capital outlay

Activity Variable	Government Final Consumption expenditure	Capital outlay
Private capital formation: PI	Negative	Negative
Private capital formation: PII	Negative	Positive
Private Final Consumption Expenditure: PI	Positive	Negative
Private Final Consumption Expenditure: PII	Positive	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

Table 7d. Long-term impact of expenditure composition on economic activity: government final consumption expenditure Vs. capital outlay

Activity Variable	Government Final Consumption expenditure	Capital outlay
Private capital formation: PI	Positive*	Negative***
Private capital formation: PII	Positive***	Negative**
Private Final Consumption Expenditure: PI	Positive	Positive
Private Final Consumption Expenditure: PII	Negative	Negative

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

### (c) Central government Vs State government expenditures

Greater decentralisation of expenditures and increasing involvement of States in fiscal decision process has been a point of debate in the centre state relations in the federal structure. Responsibilities of the states in meeting the costs of welfare programs and the resources they command are often unevenly divided with the Centre.<sup>15</sup> Advocates of liberalisation emphasise greater efficiency of public expenditures when they are made by the local governments for producing local public goods. And therefore, whether spending by the states is more effective than by the Centre on the basis of some selected criteria remains an important issue. We examine if there is an evidence of such patterns at the aggregate level.

In Table 8, we summarise the results of estimation to assess the relationship between impact of expenditure made by Central and State governments on aggregate private capital formation and private final consumption expenditure (Estimation details are in Annexure Table A5).

In terms of long-term effects, Central government expenditures have no significant impact on either private capital formation or private final consumption expenditure. But expenditure by the state governments has significant long-term impact on these two activity variables. The state government expenditure has a negative long-term impact on private final consumption expenditure and positive impact on private capital formation in both the periods considered here. This is an important result in the sense that it both agrees and disagrees to both classical and Keynesian frameworks. On the one hand, while state governments' expenditure stimulus leads to private investment as predicted by the Keynesian model, long-term wealth effect tends to dampen consumption decision. It is also observed that the coefficients of the state level variable are larger than those of the central government. The results point to the need to examine more carefully the case for shifting greater spending responsibilities at the state level.

Table 8a. Short-term impact of budgetary composition on economic activity: Central government expenditure Vs. State government expenditure

Activity variable	Central government expenditure	State government expenditure
Private capital formation - PI	Positive**	Negative
Private capital formation - PII	Positive	Negative
Private final consumption expenditure- PI	Negative	Positive***
Private final consumption expenditure- PII	Negative	Positive***

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

Table 8b. Long-term impact of budgetary composition on economic activity: Central government expenditure Vs. State government expenditure

<sup>15</sup> See World Bank (2004), and also the Report of the Eleventh Finance Commission of India

Activity variable	Central government expenditure	State government expenditure
Private capital formation- PI	Negative	Positive**
Private capital formation- PII	Negative	Positive**
Private final consumption expenditure –PI	Positive	Negative***
Private final consumption expenditure- PII	Negative	Negative**

Note: If the estimated coefficient is significant, then the level of significance is indicated by \*\*\* for 1%, \*\* for 5% and \* for 10% along with the sign of the coefficient in the table. Period-I is indicated by PI and period II by PII.

### 3. Summary and Concluding Remarks

One positive implication of 1991 crisis was increased awareness about importance of fiscal discipline. However, the initial prudence was short lived and by the end of 1990s, the fiscal deficit as a percentage of GDP soared to double digits and but for the strong external sector conditions, repeat of 1991 crisis may have continued to haunt. Realising the loss of control, the parliament had to enact Fiscal Responsibility and Budget Management Act in 2002, which lays down target based reduction in revenue and gross fiscal deficit of the Central government over a five-year period. Achieving the FRBM targets will require appropriate revenue and expenditure adjustments. The Task Force on implementation of FRBM Act has emphasised the need for revenue improvement through more productive tax administration and rationalisation of tax regime (Government of India, 2004). The fiscal management clearly requires both expenditure and revenue measures.

In this paper, we have provided an empirical assessment of some of the alternative paths of revenue and expenditure management. A regression model capturing the long-term and short-term effects of fiscal management alternatives is specified and estimated. The model also provides for assessment of causality relationship between fiscal alternatives and private sector response to investment and consumption. The period of analysis covers a fairly long horizon between 1970 to 2002. However, the periods between 1980 and 2002 are marked with economic reforms of varying intensity. Therefore, all the results are presented in two sets: one covering the full time period, while the other covers only 1980-2002. We do realise the possibilities of alternative explanations to final outcome. For example, this analysis does not model the process and effects of liberalisation per se. Nevertheless, the two-period analysis does captures variations in economic environment to a considerable extent as indicated by some of the results.

The results of analysis indicate that changes in overall tax revenues have short-term effects on activity variables but there is no evidence of long-term effect. However, when tax instruments are separated as direct and indirect taxes, the impact on both consumption and investment is significant. Both direct and indirect taxes measured as ratios to GDP have significant positive effects on investment and significant negative effects on consumption. However, the response of investment and consumption to direct taxes is greater than the response to indirect taxes. Thus, the implications are clear, if the aim of fiscal stimulus is to increase investment and promote saving (reduce consumption) then revenue mix should tilt towards direct taxes. Direct tax also has positive effect on exports both in the short run and long run but the indirect tax has negative short-run effects.

When it comes to expenditure, the distinction between development and non-development expenditure matters. However, the impact seems perverse: higher development expenditure has a negative long-term impact on private investment and non-development expenditure has a positive impact. One implication of the result is either the accounting system has led to unforeseen incentives or such expenditure is inefficient in terms of its impact on investment.

The responses of consumption and investment to changes in non-interest revenue expenditure and capital outlay also appear to be at odds with expectations. Revenue expenditure has a positive impact on private investment while capital outlay has insignificant effect on both investment and consumption. This reflects a general inefficiency in capital expenditure.

Finally, we examined the impact of composition of expenditure in terms of Central government expenditure and state government expenditure. It is expected that the Central expenditure create an overall positive environment for business while the state expenditures affect local level conditions for economic activity. The state expenditures are seen to have significant impact on both private capital formation and private final consumption expenditure.

The long-term impact on consumption expenditure is negative but it is positive on private capital formation. The impact of Central government expenditure is not significant in the long-term either on private capital formation or consumption. This favours decentralisation of expenditure process, which may lend itself to closer scrutiny by the public.

In the overall assessment, the results suggest that composition of budget indeed has a significant impact on the level of economic activity: changes in direct taxes have greater impact on the economy than indirect taxes; composition of expenditure also matters; the classification of expenditure into capital and current does not reveal the implications that capital and current spending in general are expected to have on growth: private capital formation is adversely affected by government spending on capital outlay.

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**Endnote<sup>1</sup>**

The stylised Classical model is described here first to derive the simple multipliers for fiscal shocks. Let capital  $K$ , and labour  $N$  be used to produce output  $Y$  per period, which is divided among real rate of consumption  $C$ , real rate of investment  $I$ , real rate of government purchases  $G$ , and real rate of depreciation of capital  $\delta K$ . Let  $\pi$  be anticipated inflation,  $i$  the interest rate on government bonds,  $\delta$  the rate of physical depreciation such that the appropriate cost of capital is  $i - \pi + \delta$ . Let  $P$  be the price of the unit good,  $W$  the money wage of unit labour; let  $q$  be Tobin's  $q$  and refers to the relative price<sup>1</sup> that governs firms' demand to accumulate capital; and let wealth of the household be divided between money balance  $M$ , bonds  $B$  and value of the firms  $V$ . The seven equations describing the Classical Model (Sargent, 1987) can be written as follows:

$$\begin{aligned}
 W / P &= F_N & 1 \\
 N &= N(W / P) & 2 \\
 Y &= F(K, N) & 3 \\
 C &= C(Y - T - \delta K - \frac{M + B}{P} \pi + (q(K, N, \delta, i - \pi) - 1)I, i - \pi) & 4 \\
 I &= I(q(K, N, \delta, i - \pi) - 1) & 5 \\
 Y &= C + I + G + \delta K & 6 \\
 \frac{M}{P} &= m(i, Y) & 7
 \end{aligned}$$

$$q = \frac{F_K - (i + \delta - \pi)}{i - \pi} + 1 \equiv q(K, N, i - \pi, \delta) \quad \text{and} \quad I = I\left(\frac{F_K - (i + \delta - \pi)}{i - \pi}\right) = I(q - 1)$$

The standard assumptions are:  $F_N, F_K > 0$ ;  $F_{KK}, F_{NN} < 0$ ;  $m_i < 0$ ;  $m_y > 0$ ;  $1 > C_1 > 0$ ;  $C_2 < 0$ ;  $I' > 0$ ;  $q_{i-\pi} < 0$ . In addition, it is assumed that aggregate demand decreases with increasing interest rate in order to meet the stability condition.

The system of the above seven equations can be linearised and after some simplifying assumptions (including  $dM + dB=0$ ), the multipliers can be presented in a matrix form as in equation (8).

$$\begin{bmatrix}
1 & -F_{NN} & 0 & 0 & 0 & 0 & 0 \\
-N' & 1 & 0 & 0 & 0 & 0 & 0 \\
0 & -F_N & 1 & 0 & 0 & 0 & 0 \\
0 & -C_1 I'_{q_N} & -C_1 & 1 & -C_1(q-1) & (-C_1 I'_{q_{i-\pi}} + C_2) & -C_1 \pi (M+B)/p^2 \\
0 & -I'_{q_N} & 0 & 0 & 1 & -I'_{q_{i-\pi}} & 0 \\
0 & 0 & 1 & -1 & -1 & 0 & 0 \\
0 & 0 & m_y & 0 & 0 & m_i & M/p^2
\end{bmatrix}
\begin{bmatrix}
d(w/p) \\
dN \\
dY \\
dC \\
dI \\
di \\
dp
\end{bmatrix}
\quad (8)$$

$$= \begin{bmatrix}
F_{NK} dK \\
0 \\
F_k dK \\
[-C_1 dT - C_1 \delta dK - C_1 ((M+B)/p) d\pi + C_1 I q_K dK - (C_1 I q_{i-\pi} + C_2) d\pi] \\
I' q_K dK - I' q_{i-\pi} d\pi \\
dG + \delta dK \\
dM/p
\end{bmatrix}$$

Important implications of this model are pro-cyclical response of investment to tax, counter-cyclical response of Investment and consumption to government expenditure and counter-cyclical response of consumption to changes in tax.

$$\frac{\partial I}{\partial T} = I' q_{i-\pi} \frac{\partial i}{\partial T} > 0 \quad (9)$$

$$\frac{\partial I}{\partial G} = I' q_{i-\pi} \frac{\partial i}{\partial G} < 0 \quad (10)$$

$$\frac{\partial C}{\partial T} = -C_1 + (C_2 + C_1 I q_{i-\pi} + C_1 (q-1) I' q_{i-\pi}) \frac{\partial i}{\partial T} < 0 \quad (11)$$

$$\frac{\partial C}{\partial G} = -C_1 + C_1 I q_{i-\pi} + C_1 (q-1) I' q_{i-\pi}) \frac{\partial i}{\partial G} < 0 \quad (12)$$

Removing equation (2) from the set of seven equations stated earlier leads to Keynesian framework where money wage is exogenous and the expression for disposable income is modified as  $Y_D = C(Y - T - \delta K - \frac{M+B}{p} \pi, i - \pi)$  in correspondence with the wealth

concept and individual perception of rate at which they can consume keeping their real wealth unchanged. The solution to the system of equations in this case is more complex because numbers of variables exceed the number of equations and additional variables need to be specified as exogenous. IS and LM curves represent equilibrium in goods markets and money markets. Combining IS and LM schedules through endogenous interest rate obtains aggregate demand schedule. The general equilibrium of the above system provides a set of multipliers or short run effects with  $dK = 0$ .

$$\begin{aligned}
& dY \left(1 - C_1 - I' \frac{q_N}{F_N} + \frac{C_2 + I' q_{i-\pi}}{m_i} m_y\right) \\
&= -C_1 dT + dG - (C_2 + I' q_{i-\pi}) d\pi^e + \frac{(C_2 + I' q_{i-\pi})}{m_i} \frac{dM}{P} \\
&\quad - \frac{(C_2 + I' q_{i-\pi})}{m_i} \frac{M}{P^2} dP
\end{aligned}$$

Under the assumption that marginal propensity to save exceed marginal propensity to invest  $(1 - C_1 > I' \frac{q_N}{F_N})$  and

$C_2 + I' q_{i-\pi} < 0$ , the aggregate demand schedule leads to following results.

$$\frac{dY}{dG} = \frac{1}{\left(1 - C_1 - I' \frac{q_N}{F_N} + \frac{C_2 + I' q_{i-\pi}}{m_i} m_y\right)} > 0$$

$$\frac{dY}{dT} = \frac{-C_1}{\left(1 - C_1 - I' \frac{q_N}{F_N} + \frac{C_2 + I' q_{i-\pi}}{m_i} m_y\right)} < 0$$

which in turn lead to the following results

$$\frac{\partial I}{\partial T} = \frac{\partial I}{\partial Y} \frac{\partial Y}{\partial T} < 0; \quad \frac{\partial I}{\partial G} = \frac{\partial I}{\partial Y} \frac{\partial Y}{\partial G} > 0; \quad \frac{\partial C}{\partial T} = \frac{\partial C}{\partial Y} \frac{\partial Y}{\partial T} < 0; \quad \text{and} \quad \frac{\partial C}{\partial G} = \frac{\partial C}{\partial Y} \frac{\partial Y}{\partial G} > 0$$

ANNEXURE TABLES: ESTIMATION RESULTS

Table A1: Effects of tax and non-tax revenue as percentage of GDP on goal variables

Year	Effect details	Tax revenue	Non-tax revenue
Goal Variable: Private capital formation			
1983-2002	Long term effect & P-values	-3.009 [0.216]	24.293 [0.161]
	Short term effect & P-values	-0.939 [0.373]	- 2.162 [0.446]
	Short term causality: P-values	[0.026]	[0.338]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
1973-2002	Long term effect & P-values	-1.162 [0.616]	11.601 [0.250]
	Short term effect & P-values	-1.193 [0.195]	0.879 [0.652]
	Short term causality: P-values	[0.108]	[0.849]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
Goal Variable: Private final consumption expenditure			
1983-2002	Long term effect & P-values	-3.140 [0.480]	-27.842 [0.094]
	Short term effect & P-values	0.670 [0.341]	0.794 [0.601]
	Short term causality: P-values	[0.222]	[0.656]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
1973-2002	Long term effect & P-values	-14.214 [209]	25.776 [0.484]
	Short term effect & P-values	0.100 [0.922]	-2.912 [0.159]
	Short term causality: P-values	[0.153]	[0.143]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		

Table A2: Effects of direct and indirect taxes on goal variables

Year	Effect details	Direct tax	Indirect tax
Goal Variable: Private capital formation			
1983-2002	Long term effect & P-values	6.704 [0.00]	1.707 [0.00]
	Short term effect & P-values	-5.081 [0.413]	- 1.985 [0.163]
	Short term causality: P-values	[0.011]	[0.000]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
1973-2002	Long term effect & P-values	5.000 [0.00]	0.779 [0.00]
	Short term effect & P-values	-0.070 [0.984]	- 1.823 [0.151]
	Short term causality: P-values	[0.733]	[0.029]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
Goal Variable: Private final consumption expenditure			
1983-2002	Long term effect & P-values	-15.390 [0.00]	- 5.039 [0.000]
	Short term effect & P-values	2.411 [0.395]	2.782 [0.025]

Year	Effect details	Direct tax	Indirect tax
	Short term causality: P-values H0: First lag of first difference = 0 Second lag of first difference = 0	[0.123]	[0.002]
1973-2002	Long term effect & P-values Short term effect & P-values	-9.93 [0.001] -6.868 [0.007]	- 4.205 [0.000] 0.781 [0.428]
	Short term causality: P-values H0: First lag of first difference = 0 Second lag of first difference = 0	[0.151]	[0.089]

Table A2 continued.

Goal Variable: Exports			
1983-2002	Long term effect & P-values Short term effect & P-values	2.978 [0.00] 6.974 [0.063]	-0.104 [0.657] -1.997 [0.093]
	Short term causality: P-values H0: First lag of first difference = 0 Second lag of first difference = 0	[0.262]	[0.045]
1973-2002	Long term effect & P-values Short term effect & P-values	3.470 [0.000] 2.771 [0.030]	0.058 [0.672] -0.729 [0.134]
	Short term causality: P-values H0: First lag of first difference = 0 Second lag of first difference = 0	[0.670]	[0.142]
Goal Variable: Exports including commercial services			
1983-2002	Long term effect & P-values Short term effect & P-values	-3.22 [0.323] -2.336 [0.001]	-0.619 [0.343] -0.265 [0.035]
	Short term causality: P-values H0: First lag of first difference = 0 Second lag of first difference = 0	[0.000]	[0.000]
1973-2002	Long term effect & P-values Short term effect & P-values	29.65 [0.876] -1.20 [0.012]	-4.519 [0.890] -0.090 [0.460]
	Short term causality: P-values H0: First lag of first difference = 0 Second lag of first difference = 0	[0.001]	[0.000]

Table A3: Effects of direct and indirect developmental and non-developmental expenditure on goal variables

Year#	Effect details	Developmental expenditure	Non-developmental expenditure
Goal Variable: Private capital formation			
1983-2002	Long term effect & P-values Short term effect & P-values	-0.332 [0.000] .590 [0.563]	0.993 [0.000] -3.685 [0.110]
	Short term causality: P-values H0: First lag of first difference = 0	[0.223]	[0.030]

Year#	Effect details	Developmental expenditure	Non-developmental expenditure
Goal Variable: Private final consumption expenditure			
1983-2002	Long term effect & P-values	-4.243 [0.716]	-3.330 [0.397]
	Short term effect & P-values	0.150 [0.765]	0.386 [0.589]
	Short term causality: P-values	[0.586]	[0.860]
	H0:		
	First lag of first difference = 0		
# Data set is available only since 1980			

Table A4: Effects of non-interest revenue expenditure and capital outlays on goal variables#

Year	Effect details	Revenue expenditure	Capital outlay
Goal Variable: Private capital formation			
1983-2002	Long term effect & P-values	1.124 [0.020]	-2.434 [0.000]
	Short term effect & P-values	-0.321 [0.888]	-2.777 [0.597]
	Short term causality: P-values	[0.641]	[0.776]
	H0:		
	First lag of first difference = 0		
1973-2002	Long term effect & P-values	2.357 [0.000]	-2.708 [0.000]
	Short term effect & P-values	-0.597 [0.497]	0.698 [0.632]
	Short term causality: P-values	[0.144]	[0.272]
	H0:		
	First lag of first difference = 0		

Table A4 Continued.

Year	Effect details	Non-interest revenue expenditure	Capital outlay
Goal Variable: Private final consumption expenditure			
1983-2002	Long term effect & P-values	2.161[0.815]	17.144 [0.376]
	Short term effect & P-values	0.324 [0.438]	-0.336 [0.581]
	Short term causality: P-values	[0.414]	[0.572]
	H0:		
	First lag of first difference = 0		
1973-2002	Long term effect & P-values	-63.71 [0.953]	- 110.12 [0.960]
	Short term effect & P-values	0.019 [0.982]	-0.728 [0.665]
	Short term causality: P-values	[0.525]	[0.139]
	H0:		
	First lag of first difference = 0		

Table 4 Continued.

Year	Effect details	Govt. Consumption expenditure	Capital outlay
Goal Variable: Private capital formation			
1983-2002	Long term effect & P-values	0.956 [0.053]	-1.714 [0.000]
	Short term effect & P-values	-1.144 [0.357]	-0.960 [0.742]
	Short term causality: P-values	[0.061]	[0.645]
	H0:		
	First lag of first difference = 0		
1973-2002	Long term effect & P-values	1.852 [0.000]	-1.260 [0.018]
	Short term effect & P-values	-0.6235 [0.354]	0.055 [0.965]
	Short term causality: P-values	[0.04]	[0.595]
	H0:		

First lag of first difference = 0

Table 4 Continued.

Year	Effect details	Government consumption expenditure	Capital outlay
Goal Variable: Private final consumption expenditure			
1983-2002	Long term effect & P-values	0.350 [0.870]	10.183 [0.020]
	Short term effect & P-values	0.509 [0.212]	-1.333 [0.221]
	Short term causality: P-values	[0.313]	[0.563]
	H0:		
	First lag of first difference = 0		
1973-2002	Long term effect & P-values	-34.806 [0.917]	- 79.974 [0.932]
	Short term effect & P-values	0.047 [0.943]	-1.056 [0.479]
	Short term causality: P-values	[0.906]	[0.133]
	H0:		
	First lag of first difference = 0		

# Second lag of first difference was not included as it was systematically not different than zero for both variables in all formulations tested.

Table A5: Effects of expenditures of Central and State Governments on goal variables

Year	Effect details	Central government	State government
Goal Variable: Private capital formation			
1983-2002	Long term effect & P-values	-1.356 [0.317]	6.10 [0.037]
	Short term effect & P-values	4.172 [0.050]	-4.367 [0.116]
	Short term causality: P-values	[0.337]	[0.150]
	H0:		
	First lag of first difference = 0		
1973-2002	Long term effect & P-values	-0.750 [0.604]	1.872 [0.035]
	Short term effect & P-values	1.477 [0.218]	-3.649 [0.112]
	Short term causality: P-values	[0.297]	[0.353]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
Goal Variable: Private final consumption expenditure			
1983-2002*	Long term effect & P-values	0.320 [0.860]	-16.948 [0.004]
	Short term effect & P-values	-7.509 [0.364]	8.295 [0.000]
	Short term causality: P-values	[0.045]	[0.000]
	H0:		
	First lag of first difference = 0		
	Second lag of first difference = 0		
1973-2002	Long term effect & P-values	-2.115 [0.484]	-3.913 [0.023]
	Short term effect & P-values	-0.994 [0.183]	3.740 [0.001]
	Short term causality: P-values	[0.259]	[0.000]
	H0:		
	First lag of first difference = 0		

Year	Effect details	Central government	State government
	Second lag of first difference = 0		

\* 3 lags of dependent variable used

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#### List of Acronyms

C	Consumption expenditure
CAP	Capital Outlay of Government
DEV	Development Expenditure of Government
DTAX	Direct Tax Revenue
EXPT	Merchandise Exports
G	Government expenditure
GCFPVT	Gross Capital Formation in Private Sector
GCFTOT	Total Gross Capital Formation
GDP	Gross Domestic Product
GDPFC	GDP at factor cost
GDPMP	GDP at Market Prices
GOI	Government of India
GFCE	Government Final Consumption Expenditure
I	Investment expenditure
INDTAX	Indirect Tax Revenue
IS	Locus of output and rate of interest when goods market is in equilibrium
LM	Locus of output and rate of interest when money market is in equilibrium
MPSCEXP	Merchandise plus Services Exports
NDEV	Non-development Expenditure of Government
NINT	Non-interest revenue expenditure of Government
PFCE	Private Final Consumption Expenditure
PSU	Public Sector Undertaking
RE	Revenue Expenditure
T, TAX	Tax Revenue
TEXP	Total Expenditure of the Government
VAT	Value Added Tax

Note: The suffix \_R indicates that the variable is in constant prices; the fiscal variables are for Centre plus States unless specifically indicated.