CYCLICALITY OF FISCAL POLICY IN INDIA

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This paper examines the cyclicality of fiscal policy in India at the Union government level through three alternative approaches. The analysis covering the time period 1970-71 to 2012-13 reveals that the government expenditure in India is, by and large, pro-cyclical. There are, however, significant differences in the degree of pro-cyclicality across different components of expenditure. Capital outplay displayed the highest pro-cyclicality, particularly in the short run, implying government's tendency to cut the same at the time of business cycle downswing to save resources. Revenue expenditure, on the other hand, was found to be inelastic with respect to output in the short run, reflecting the underlying rigidity in cutting these expenditures at bad times. Developmental expenditure was found to be far more pro-cyclical compared to non-developmental expenditure. The Government's tendency to cutback capital outlay and developmental expenditure at the time of economic slowdown works as detrimental to economic growth and development. Going forward, the main challenge for the Government would be to meet its fiscal deficit targets without hurting the economic growth.

Introduction

Cyclicality of fiscal policy indicates whether the government's revenues and expenditures move in the same direction or in the opposite direction with output. A fiscal policy is called pro-cyclical if it is expansionary in good times (economic booms) and contractionary in bad times (economic recessions). Opposite is the case for a counter-cyclical policy. It is generally perceived that while the fiscal policies in the advanced economies tend to be counter-cyclical, the same in the developing countries are to a large extent pro-cyclical in nature.

The issue of cyclicality of fiscal policy received considerable attention during the global financial crisis. The large scale economic downturn accompanying the financial crisis led to activation of counter-cyclical fiscal policy measures of unprecedented magnitude. The fiscal measures focused on improving the balance sheet of the financial and corporate sectors as reflected in large scale bailouts in the US and other advanced economies. In addition, several countries used discretionary fiscal policy measures to boost economic growth. For instance, most of the OECD countries had adopted broad ranging stimulus programmes involving tax and expenditure adjustments. There was, however, a general tendency towards preferring tax cuts over boosting expenditure. Most common among the expenditure measures were increased expenditure on investment in infrastructure and provision of safety net through transfers (RBI 2009). The contagion from the global financial crisis also warranted swift monetary and fiscal policy responses in emerging market economies (EMEs) for ensuring orderly functioning of markets, preserving financial stability, and moderating its adverse effects on growth (Mohanty 2011). Like elsewhere, the Indian government also responded with counter-cyclical measures including tax cuts and increases in expenditures to combat the rapid slowdown of economic growth.

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The objective of this paper is to examine the cyclicality of government expenditure in India at the Union/Central government level. Accordingly, an attempt has been made to find out whether different components of central government's expenditure move in a pro-cyclical or counter-cyclical manner through alternative measures of fiscal cyclicality. The analsysis has been extended further to spot whether there has been any change in cyclicality in the post-reform period. The organization of the paper is as follows. A review of select literature is provided in Section 1. The major components of government expenditure in India are discussed in Section 2. The methodology and data sources are described in Section 3. The estimation results are discussed in Section 4. The conclusions are drawn in Section 5.

1 Review of select literature

The Keynesian view supports the role of discretionary fiscal policy as a counter-cyclical measure to boost aggregate demand and support growth. From a Keynesian perspective, public expenditure should act as a stabilizing force and move in a counter-cyclical direction. This implies that ideally, the fiscal policy should lower taxes and increase expenditure during the downswing of business cycle, to increase the aggregate demand. On the other hand, it should reduce expenditure and increase savings during the upswing of the business cycle. In reality, however, evidence of pro-cyclicality in fiscal policy has been covered in a number of studies (Lane, 2003).

Empirical evidence reveals that there is significant variation across countries in terms of fiscal cyclicality. Variation in cyclicality has been observed across different components of fiscal policy *viz.* government expenditure and revenue as well. The findings of the empirical studies in this regard are discussed below.

1.1 Cyclicality across countries

Empirical findings reveal that in the advanced economies, the fiscal policy tends to be counter-cyclical, while in the developing countries, it tends to be pro-cyclical. Kaminsky *et al*. (2004) found that fiscal policies in the OECD countries are counter-cyclical or anti-cyclical in nature. Telvi and Vegh (2005), on the other hand, showed that government spending and taxes are highly pro-cyclical in the less developed economies. Halland and Bleaney (2011) generated the cyclicality estimates for 85 advanced and developing countries for the period 1980-2004 and found that pro-cyclicality is higher on an average, with a much wider range of variation, in developing countries than in OECD countries.

Various hypotheses have been put forward by economists to explain variations in fiscal cyclicality between advanced and developing economies. As per those hypotheses, the differential in the cyclicality in fiscal policy between advanced and developing economies arises from: (i) restrictions on access to domestic (Caballero and Khrishnamurthy, 2004) and/or international credit markets (Gavin and Perotti, 1997; Calderón and Schmidt-Hebbel, 2008); (ii) institutions or political structures (Alesina *et al.*, 2008; Thornton, 2008; Talvi and Végh, 2000); and (iii) the polarization of preferences associated with social inequality (Woo, 2009).

According to the credit restrictions hypothesis, developing countries find it difficult to smooth the business cycle due to limited access to international credit markets, which prevents them from borrowing during bad times. Regarding institutional structure, *Alesina et al.* (2008) found that fiscal policy is more pro-cyclical in countries where corruption is more widespread. In contrast, Thornton (2008) finds that less corruption actually leads to more pro-cyclical fiscal policy in a sample of 37 African countries. Telvi and Végh (2000) found that the ability to run budget surpluses in good times is severely hampered in the developing countries due to political pressures

to spend more. As a result, fiscal resources may be wasted, in favour of *inter alia* government agencies, state-owned enterprises, and rent seekers, rather than being used to retire debt. The implicit low propensity to save in good times translates into contractionary fiscal policy in bad times, since there is less saving available for smoothing the business cycle, thereby accentuating fiscal pro-cyclicality. Woo (2005) presented evidence that social polarization as measured by income or educational inequality is consistently positively associated with pro-cyclicality of fiscal policy and aggressiveness in using discretionary policy.

1.2 Cyclicality across components

Cyclicality across various components of government revenue and spending differ significantly within and across countries. Generally, it has been observed that cyclicality of certain components of fiscal policy is fixed almost by definition, due to automatic stabilizers. For example, tax revenue tends to increase during business cycle upturns and fall during recessions, reflecting pro-cyclicality. This is because GDP acts as a major determinant of collection of tax revenue during a year. During business cycle upturns, tax revenues tend to rise because of larger base, and possibly because of higher tax rate introduced to reduce the public deficit. On the other hand, during recessions, tax revenues tend to fall because of narrower base and possibly because of tax rate cuts made by the government to stimulate the economy. Government transfer is another example of automatic stabilizer. In the case of government transfer, which is a major component of government's current spending, in-built automatic stabilizers tend to generate a counter-cyclical pattern as the number of claimants falls during expansions and rises during recessions. This component, however, tend to be less relevant for developing countries, where social safety networks are less developed (Halland and Bleaney, 2011).

Among the other components of public expenditure, according to Keynesian demand management principle, public investment should move counter-cyclically. The cyclical behaviour of interest payments depends both on the cyclical behaviour of interest rates and the design of the public debt. Regarding the latter, strategic debt managers may attempt to induce a pro-cyclical pattern in debt payments, since the government can better afford high debt payments during boom periods (Missale 1999). Arreaza *et al.* (1999) generated panel-based estimates of the degree of cyclicality in government consumption, transfers, subsidies and (indirect and direct) tax revenues in OECD and EU countries and found that fiscal surpluses are on average pro-cyclical and government consumption is also weakly pro-cyclical.

2 Major components of central government expenditure in India

Empirical analyses of cyclicality of fiscal policy are generally focused on government expenditure. There is less number of studies analyzing cyclicality of government revenue, mainly on account of scarcity of data on tax revenues and tax rates, particularly, for the developing countries (Halland and Bleaney, 2011). In the present paper, an attempt has been made to examine the cyclicality of major components of central government expenditure in India.

Revenue expenditure, which represents current or consumption expenditure incurred on civil administration, defence forces, public health and education, maintenance of government machinery *etc* and is recurring in nature, accounts for over 85 per cent of central government's total expenditure in India. Almost half of the revenue expenditure is made towards payments of interest, subsidy and defence (Table 1). While there has been a decline in the share of defence in the recent years, the shares of interest payments and subsidies continue to remain high.

Table 1

Major Components of Central Government Expenditure in India
(percent of total expenditure)

Year	Revenue Expenditure				Capital Expenditure		
	Total	Defence	Interest Payments	Subsidies	Total	Loans and Advances	Capital Outlay
1970-71	55.7	18.7	10.8	1.7	44.3	27.6	16.7
1980-81	63.3	14.4	11.4	8.9	36.7	23.2	13.5
1990-91	69.8	10.3	20.4	11.5	30.2	18.7	11.5
2000-01	85.3	11.4	30.5	8.2	14.7	7.1	7.6
2005-06	86.9	9.5	26.2	9.4	13.1	2.2	10.9
2006-07	88.2	8.9	25.8	9.8	11.8	1.5	10.3
2007-08	83.4	7.6	24.0	10.0	16.6	1.6	15.0
2008-09	89.8	8.3	21.7	14.7	10.2	1.6	8.6
2009-10	89.0	8.9	20.8	13.8	11.0	1.5	9.5
2010-11	86.9	7.7	19.5	14.5	13.1	2.1	11.0
2011-12	87.8	7.9	20.9	16.7	12.2	1.6	10.6
2012-13 RE	88.3	7.6	22.1	18.0	11.7	1.5	10.2
2013-14 BE	86.2	7.0	22.3	13.9	13.8	1.2	12.6

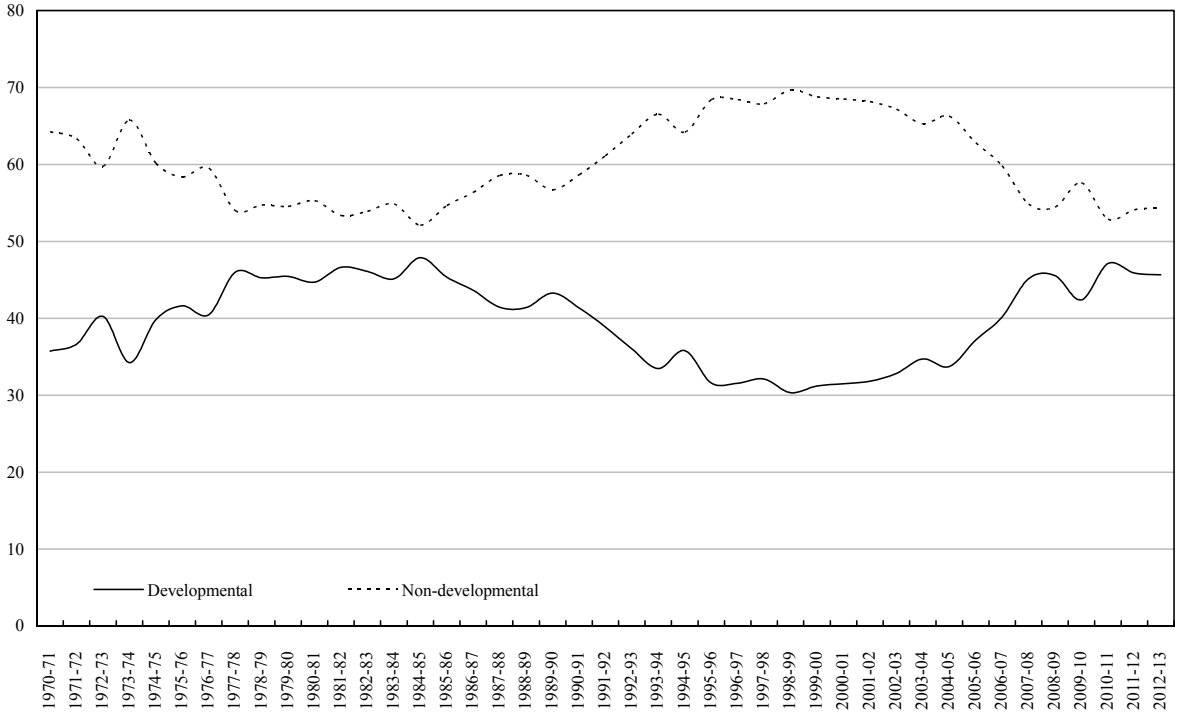
Note: RE indicates revised estimates; BE indicates budget estimates.
Source: Handbook of Statistics on Indian Economy, Reserve Bank of India.

Capital expenditures are non recurring type of expenditures, which generally take the form of capital investments on building durable assets, like highways, dams, irrigation projects, buying machinery and equipment *etc.* Such expenditures are expected to improve the productive capacity of the economy. Central government's loans and advances used to be the major component of capital expenditure till the 1990s. The share of loans and advances in total expenditure declined sharply with the creation of National Small Savings Fund (NSSF) in 1999 and channelisation of small savings collection through this fund rather than being intermediated by the centre. The share of capital outlay has remained broadly stable over the years.

Apart from revenue and capital expenditure, central government's total expenditure can be classified into developmental and non-developmental expenditure. All expenditures that promote economic growth and development are termed as developmental expenditure. In India, central government's developmental expenditure includes expenditures on railways, posts and telecommunication, social and community services, general economic services, agriculture and allied services, power, irrigation, transport and communication, *etc*. Non-developmental expenditures, which are generally unproductive in nature, mainly includes expenditures on defence services, interest payments, fiscal services (tax collection, currency, coinage, mints, *etc*.), administrative services (police, external affairs, *etc.*), pension and other retirement benefits, food subsidy, social security and welfare, *etc*. The share of central government's non-developmental expenditure continues to remain higher than the developmental expenditure in India, though the gap between the two has narrowed down substantially in the recent period (Figure 1).

Figure 1

Central Government Expenditure in India
(percent)



Source: Indian Public Finance Statistics, Government of India.

Seven categories of government expenditure have been considered in the present study. Those are: revenue expenditure, primary revenue expenditure (revenue expenditure excluding interest payments), capital expenditure, capital outlay, total expenditure, developmental expenditure and non-developmental expenditure.

3 Methodology and data sources

In economic literature, there is no consensus on how fiscal cyclicality should be measured. Authors have used different methods to empirically estimate cyclicality of fiscal policy. As observed from the literature, the simplest way to measure fiscal cyclicality is to work out the correlation between the cyclical component of output and that of the relevant fiscal variable (Kaminsky *et al.*, 2004; Talvi and Végh, 2005). Cyclical components of the output and fiscal variables are generally extracted based on the Hodrick Prescott (HP) filter method. It has been observed that HP-based measures of cyclicality may be misleading when variables have different levels of volatility (Forbes and Rigbon, 1998; Akitoby *et al.*, 2004). In view of this problem, many of the researchers have preferred regression-based measures, which are generally considered to be more precise (Lane, 2003; Woo, 2009).

For empirical estimations, the researchers have used different measures of fiscal policy. Some of them have used the growth rate of the fiscal variable, defined as the first difference of the logarithmic value. Others have used first difference of the fiscal variable as a share of GDP. Output

has also appeared in different forms in different models. Two of the most common measures of output are the growth rate of real GDP and the output gap, which is defined as the deviation from a HP trend.

Three different approaches have been used in this paper to measure the cyclicality of the selected components of government expenditure in India. A description of each of the three approaches has been provided below.

i) Fiscal cyclicality: a correlation-based approach

The first approach is to analyse the business cycle properties of the selected components of government expenditure in terms of correlation between cyclical components (HP filtered) of government expenditure and output. Real GDP at market prices has been used to measure the output. All components of government expenditure have been converted into real terms using the GDP deflator.

ii) Cyclicality coefficients: an elasticity-based approach

The second approach involves estimation of the elasticity of each of the selected expenditure variables with respect to output through time series regression. The analysis in this section is based on a simple specification of a test of cyclicality of fiscal policy as suggested by Lane (2003) and Fatás and Mihov (2003), which examines the response of rate of change of government expenditure to rate of growth of output:

$$D(\log(G_t)) = \alpha + \beta D(\log(Y_t)) + \varepsilon_t \quad (1)$$

Here, G is the government expenditure in real term; Y is the real GDP. The coefficient β represents cyclicality of fiscal policy. It measures the elasticity of government expenditure with respect to output growth. Therefore the terms cyclicality coefficient and elasticity coefficient have been used inter-changeably in the analysis. A positive value of β implies pro-cyclical behaviour; a value above unity implies a more than proportionate response of government expenditure to output fluctuations.

iii) Distinction between long-run and short-run elasticity: an error-correction approach

In the third approach, the co-movements between expenditure variables and output are estimated by using the two stage method adopted by Akitoby *et al*., (2004) for estimating cyclical and long-term behaviour of government expenditures in developing countries. In this model, the co-movements that are temporary in nature are distinguished from the co-movements that reflect a steady-state or long-run path. To begin with, it is assumed, that there is a steady-state relationship between government expenditure and output, such that:

$$G = AY^{\delta} \quad (2)$$

Here G represents government expenditure (in real terms) and Y represents real output. δ is the long-run constant elasticity of government expenditure with respect to output. Equation (2) can be presented in a linear form as follows:

$$\log G = \alpha + \delta \log Y \quad (3)$$

Here $\alpha = \log A$.

The underlying assumption for the model is, if adjustment of the government expenditure (G) to its steady-state ($\overline{G}$) is gradual, then the level of expenditure will respond to transitory changes in output, and G will move gradually toward its steady-state or equilibrium level. To capture this gradual move, Akitoby *et al*., (2004) specified a general autoregressive distributed lag model for the government expenditure variable i in period t, such that:

$$\log G_{it} = \mu + \alpha \log G_{i,t-1} + \beta_0 \log Y_t + \beta_1 \log Y_{t-1} + \varepsilon_t, \quad |\alpha|<1 \tag{4}$$

This can be solved for the static, steady-state equilibrium by assuming that output is at its steady state level, $\overline{Y}$, and ignoring the error term:

$$\log (\overline{G_i}) = \mu / (1-\alpha) + \{(\beta_0 + \beta_1) / (1-\alpha)\} \log \overline{Y} \tag{5}$$

To reflect the steady state, equation (4) can be rearranged as an error-correction model:

$$\mathrm{D} (\log G_{it}) = \mu + \beta_0 \mathrm{D} \log Y_t + \gamma [\log G_{i,t-1} - \delta \log Y_{t-1}] + \varepsilon_t \tag{6}$$

Here (β_0 D log Y_t) may be interpreted as the short-term impact of output on government spending and β_0 as the short-run elasticity of the relevant expenditure variable with respect to output.

The error-correction term $\gamma[\log G_{i,t-1} - \delta \log Y_{t-1}]$ captures the deviations from the steady-state, or the long-run equilibrium, where δ is the long-run elasticity of government spending with respect to output. γ is the rate at which government spending adjusts to past disequilibrium. Moreover, equation (6) can be used to test if there is a long-run relationship between government spending and output. If such relationship exists, then, output and government spending would be co-integrated, in which case, γ will be significantly different from zero. If output and government spending are non-stationary and there is a co-integrating relationship between them, then a simple OLS regression of government spending on output as in equation 3 would yield the long-run elasticity of spending with respect to output, (δ) which is consistent.

Accordingly, equation (6) is estimated in two stages. First, an OLS regression of each of the government expenditure variable has been conducted on a constant term and output and the residuals are collected. Second, these residuals are placed as the error-correction term in equation (6). The underlying assumption is that there is a constant elasticity relationship between output and expenditure, while the transitory deviations are random. In cases where γ is insignificant, there is no steady-state relationship between fiscal variable and output, and β_0 is best estimated by omitting the error-correction term such that:

$$\mathrm{D} (\log G_{it}) = \mu + \beta_0 \mathrm{D} (\log Y_t) + \varepsilon_t \tag{7}$$

3.1 Data sources

Annual data on output (GDP) and different components of central government's expenditure for the period 1970-71 to 2012-13 have been used for the analysis. Time series data on GDP, central government's revenue expenditure, primary revenue expenditure, capital expenditure, capital outlay and total expenditure have been taken from the Handbook of Statistics on Indian Economy, Reserve Bank of India. The data on central government's developmental and non-developmental expenditure have been taken from the Indian Public Finance Statistics, Ministry of Finance, Government of India. GDP at constant market prices (2004-05 base) has been used as the measure for output. GDP deflator has been used to convert the fiscal variables into constant prices.

4 Discussion of Results

4.1 Correlation-based approach

The correlation coefficients between cyclical components of government expenditure and output, estimated for the period 1970-71 to 2012-13, are presented in Table 2. The results indicate

Table 2

Business Cycle Properties of Government Expenditure
(constant prices)

Expenditure Items	Correlation Coefficients with Respect to Output (1970-71 to 2012-13)
Revenue expenditure	*0.38**
Primary revenue expenditure	0.37*
Capital expenditure	*0.11*
Capital outlay	0.41*
Total expenditure	*0.40**
Developmental	0.49*
Non-developmental	0.27

Note: * indicates significant at 1 per cent level.

that during this period, all the components of government expenditure considered in the study, were largely pro-cyclical, with a positive correlation with output. The correlation coefficients were found to be statistically significant in case of five out of the seven expenditure categories. Among the expenditure components, developmental expenditure displayed the highest co-movement with output, followed by capital outlay. The central government's non-developmental expenditure and capital expenditure (which includes loans and advances apart from capital outlay), on the other hand, showed weak co-movement with output.

4.2 Elasticity-based approach

Before proceeding to estimate the elasticities, all the variables were first tested for their stationary properties. Augmented Dickey Fuller (ADF) unit root test was conducted to find out whether the time series used for the analysis are stationary or not. The test results indicate that the null hypothesis of a unit root cannot be rejected in case of GDP and the expenditure variables. It was also found that all the series are stationary in their first differenced form, *i.e.*, they are integrated of order 1 (Table 3). Accordingly, estimations are done using the first differenced form, which is in line with the model specification provided in equation 1.

To obtain the cyclicality coefficients of the selected components of government expenditure, equation 1 is estimated by OLS for each of the expenditure components, with a correction for first order autoregressive error term for the period 1970-71 to 2012-13. Cyclicality coefficients represent the elasticity of the respective expenditure variable with respect to output growth.

The estimation results for equation 1 are presented in Annex 1. The estimated cyclicality coefficients for the fiscal variables are furnished in Table 4. It may be observed from Table 4 that all the components of government expenditure show pro-cyclical behaviour during the period under study, as in the case of the correlation-based analysis. Six of the estimated cyclicality coefficients, *viz.* revenue expenditure, primary revenue expenditure, capital outlay, total expenditure developmental expenditure and non-developmental expenditure were found to be statistically significant.

Table 3

Unit Root Test

Variable (*X*)	ADF	
	log *X*	**D log (*X*)**
GDP	3.02	–5.85*
Revenue expenditure	–0.30	–5.92*
Primary revenue expenditure	–0.50	–6.75*
Capital expenditure	–2.03	–7.40*
Capital outlay	0.40	–8.06*
Total expenditure	–0.15	–6.32*
Developmental expenditure	–0.37	–6.10*
Non-developmental expenditure	–0.50	–7.30*

Note: * denotes significant at 1 per cent level.

Total expenditure of the central government had a cyclicality coefficient just above 1, reflecting pro-cyclicality. Among the expenditure components, capital outlay displays the highest pro-cyclicality with the estimated cyclicality coefficient with respect to output exceeding 2. This implies that the government cuts and expands this expenditure more than proportionately with output at the time of business cycle downswing and upswing, respectively. In contrast, revenue expenditure has a much smaller elasticity (cyclicality coefficient), reflecting the underlying rigidity in cutting these expenditures during bad times. As expected, the elasticity of primary revenue expenditure, which excludes interest payments, is slightly higher than the elasticity of revenue expenditure with respect to output. The cyclicality coefficient for capital expenditure, which also includes loans and advances apart from capital outlay, lacked statistical significance. Like in the case of correlation-based analysis, developmental expenditure is found to be far more pro-cyclical compared to non-developmental expenditure.

The higher pro-cyclicality of capital outlay and developmental expenditure indicate that during the times of economic slowdown, the central government in India tend to cut back these expenditures in order to contain fiscal deficit. A cut in these expenditures, which are non-obligatory in nature, work towards offsetting the impact of declining tax revenues on fiscal deficit. This policy, however, works against the Keynesian demand management principle that government should increase expenditure at the time of economic recession to boost aggregate demand. Accordingly, the reduction of capital outlay (which represent government investment) and developmental expenditure at the time of recession work as detrimental to economic growth and development.

4.2.1 Inter-temporal analysis

In order to find out, whether there has been a change in the cyclicality of the government expenditure during the post-reform period, the entire period of 1970-71 to 2012-13 has been broken

Table 4

Cyclicality Coefficients of Select Expenditure Categories

Expenditure Items	Full Period (1970-71 to 2012-13)
Revenue expenditure	*0.67***
Primary revenue expenditure	0.78**
Capital expenditure	*1.51*
Capital outlay	2.44*
Total expenditure	*1.09**
Developmental	1.32*
Non-developmental	0.75**

Note: * and ** indicate significant at 1 per cent and 5 per cent levels, respectively.

into two sub-periods: pre-reform Period I (1970-71 to 1990-91) and post-reform Period II (1991-92 to 2012-13). The cyclicality coefficients for the selected expenditure categories have been estimated separately for each of the two sub- periods. The results reveal significant differences between the estimated coefficients for Period I and Period II (Table 5).

It may be observed from Table 5 that during Period I, all the components of government expenditure displayed pro-cyclical movements with respect to output with a positive cyclicality coefficient. The estimated cyclicality coefficients were statistically significant in the case of five out of the seven expenditure categories *viz.* revenue expenditure, capital expenditure, capital outlay, total expenditure and non-developmental expenditure. Most of the estimated cyclicality coefficients in period II were lower than in Period I. The cyclicality coefficients for three of the expenditure categories *viz.* revenue expenditure, primary revenue expenditure and non-developmental expenditure have turned negative in Period II, reflecting counter-cyclical behavior. All of the cyclicality coefficients in Period II, however, were found to be statistically insignificant.

4.3 Distinction between long-run and short-run elasticity: error-correction approach

Equation 6 has been estimated by OLS for each of the expenditure categories (the results are presented in Annex 2). In the cases, where γ was found to be statistically significant (at least at 5 per cent level), a co-integrating relationship between output and the respective expenditure variables was perceived. For those expenditure variables, having a co-integrating relationship with output, the estimated β_0 from equation 6 gives the short-run elasticity with respect to output. The long-run elasticity coefficient δ is then derived through a simple OLS regression of the expenditure variable and the output. In cases, where the error-correction term was found to be insignificant, the short-run elasticity coefficients were obtained by estimating equation 7. The short-run and long-run elasticity of the selected government expenditure variables with respect to output are reported in Table 6.

Table 5

Inter-temporal Comparison of Cyclicality Coefficients

Expenditure Items	Period I (1970-71 to 1990-91)	Period II (1991-92 to 2012-13)
Revenue expenditure	*1.07***	*–0.59*
Primary revenue expenditure	1.02	–0.97
Capital expenditure	*2.16**	*0.33*
Capital outlay	2.25**	2.57
Total expenditure	*1.43**	*0.09*
Developmental	1.04	1.48
Non-developmental	1.26**	–0.40

Note: * and ** indicate significant at 1 per cent and 5 per cent levels, respectively.

It may be observed from Annex 2 and Table 6 that 6 out of the 7 expenditures categories have a long-run relationship with output. The estimated γ was found to be statistically insignificant only in the case of non-developmental expenditure. All the estimated elasticity coefficients were found to be positive both in the long and short run. While 6 of the estimated elasticity coefficients were found to be statistically significant in the long run, 5 were found to be statistically significant in the short run.

The short-run elasticity for revenue and primary revenue expenditure were lower than their long-run elasticity, reflecting the difficulty in adjusting such expenditures with business cycle fluctuations in the short run. Opposite is the case for capital outlay, which seems to be highly elastic in the short run indicating that the government adjusts these expenditures to business cycle fluctuations in the short run. The elasticity for total expenditure and developmental expenditure remain largely similar both in the short and the long run.

5 Conclusions

The findings of the study reveal that as perceived, the central government expenditure in India is largely pro-cyclical. There are, however, substantial variations in cyclical behaviour across different components of expenditure. Both correlation-based and elasticity- based analysis covering the time period 1970-71 to 2012-13 reveal that among the components of government expenditure, capital outlay tends to be far more pro-cyclical compared to revenue expenditure. This implies that the government cuts and expands capital outlay proportionally more during the times of recession and expansion, respectively. Revenue expenditure, on the other hand, showed lower response to changes in output, reflecting the underlying rigidity in cutting these expenditures during bad times. Similarly, developmental expenditure was found to be more pro-cyclical compared to non-developmental expenditure.

Table 6

Long-run and Short-run Elasticity

Expenditure Items	Elasticity	
	Long-run	**Short-run**
Revenue expenditure	*1.11**	*0.63***
Primary revenue expenditure	1.10*	0.68
Capital expenditure	*0.36**	*1.38*
Capital outlay	0.89*	2.44*
Total expenditure	*0.96**	*0.95**
Developmental	1.05*	1.16**
Non-developmental		0.75**

Note: * and ** indicate significant at 1 per cent and 5 per cent levels, respectively.
In case of non-developmental expenditure, a long-run steady-state relation with output was not found.

During the period from 1990-2012, the fiscal policy in India went through many significant developments, like introduction of fiscal reforms (1990s), rule based fiscal policy regime (mid-2000s), counter-cyclical fiscal stimulus to combat the crisis (2008-09 and 2009-10) and gradual withdrawal of stimulus measures since 2010-11. Inter-temporal analysis revealed that the fiscal policy in India has generally become less pro-cyclical during the post-reform period, with most of the components of government expenditure showing lower elasticity with respect to output compared to the pre-reform period.

An analysis of short-run and long-run elasticity of expenditure variables was taken up to distinguish the expenditure movements which are temporary in nature from those which are more permanent in nature. The short-run elasticity for revenue and primary revenue expenditure were lower than their long-run elasticity, reflecting the difficulty in adjusting such expenditures with business cycle fluctuations in the short run. Opposite is the case for capital expenditure and capital outlay. These expenditures seem to be highly elastic in the short run indicating that the government adjusts these expenditures to business cycle fluctuations in the short run. The elasticity for total expenditure and developmental expenditure remain largely similar both in the short and the long run.

The higher pro-cyclicality of capital outlay and developmental expenditure, particularly in the short run, indicates that during the times of business cycle downswing, the central government in India tends to cut back these expenditures in order to contain fiscal deficit. A cut in these expenditures, which are non-obligatory in nature, works towards offsetting the impact of declining tax and non tax revenues on fiscal deficit. This policy, however, works against the Keynesian demand management principle that government should increase expenditure at the time of economic recession to boost aggregate demand. Accordingly, the reduction of capital outlay (which represent government investment) and developmental expenditure at the time of recession work as detrimental to economic growth and development.

Going forward, the main challenge for the government would be to meet its fiscal deficit targets without hurting the economic growth. On the expenditure front, a cut down in overall expenditure without sacrificing the quality would assume importance. Accordingly, while a cut in the non-plan revenue expenditure is likely to prove beneficial to the economy, a cut down in capital and developmental expenditure would be damaging to growth.

ANNEX 1

Estimation Results for Cyclicality Coefficients (Equation 1)

1 Full Period (1970-71 to 2012-13)

Dependent Variable	Constant	D log (GDP)	AR (1)	Adjusted R^2	DW
1	2	3	4	5	6
Revenue expenditure	0.03	0.67**	0.09	0.07	1.93
Primary revenue expenditure	0.02	0.78**	0.07	0.06	1.96
Capital expenditure	–0.05	1.51		0.04	2.06
Capital outlay	–0.08	2.44*	–0.24	0.21	1.97
Total expenditure	–0.00	1.09*	0.11	0.17	1.97
Developmental expenditure	–0.00	1.32*	0.02	0.10	2.04
Non-developmental expenditure	0.02	0.75**	–0.02	0.07	1.69

Note: * and ** denote significant at 1 per cent and 5 per cent level, respectively.

2 Period I (1970-71 to 1990-91)

Dependent Variable	Constant	D log (GDP)	AR (1)	Adjusted R^2	DW
1	2	3	4	5	6
Revenue expenditure	0.02	1.07**	–0.01	0.12	2.03
Primary revenue expenditure	0.02	1.02	–0.03	0.07	2.06
Capital expenditure	–0.05	2.16*		0.36	2.14
Capital outlay	–0.05	2.25**		0.17	2.04
Total expenditure	0.00	1.43*		0.26	2.02
Developmental expenditure	0.03	1.04		0.03	2.16
Non-developmental expenditure	0.01	1.26**		0.19	2.04

Note: * and ** denote significant at 1 per cent and 5 per cent level, respectively.

3 Period II (1991-92 to 2012-13)

Dependent Variable	Constant	D log (GDP)	AR (1)	Adjusted R^2	DW
1	2	3	4	5	6
Revenue expenditure	0.11*	–0.59	0.45	0.07	1.85
Primary revenue expenditure	0.14*	–0.97	0.48**	0.06	1.98
Capital expenditure	0.01	0.33		–0.05	2.21
Capital outlay	–0.10	2.57	–0.43	0.19	1.92
Total expenditure	0.06**	0.09	0.67	0.35	1.80
Developmental expenditure	–0.02	1.48	0.15	0.05	2.05
Non-developmental expenditure	0.08	–0.40	–0.22	–0.04	1.85

Note: * and ** denote significant at 1 per cent and 5 per cent level, respectively.

ANNEX 2

Estimation Results for Short-run Elasticities (Equation 6): Error-correction Model

Dependent Variable	Constant	D log (GDP)	Adjustment Coefficient (γ)	Adjusted R^2	DW
1	2	3	4	6	7
Revenue expenditure	0.04	0.63**	–0.18**	0.13	1.57
Primary revenue expenditure	0.03	0.68	–0.26*	0.18	1.55
Capital expenditure	–0.04	1.38	–0.45*	0.25	1.75
Capital outlay	–0.08	2.44*	–0.20**	0.22	2.13
Total expenditure	0.01	0.95*	–0.23*	0.24	1.59
Developmental expenditure	0.01	1.16**	–0.16**	0.16	1.77
Non-developmental expenditure	0.02	0.69	–0.08	0.05	1.84

Note: * and ** denote significant at 1 per cent and 5 per cent level, respectively.

Estimation Result for Long-run Elasticities (Equation 3)

Dependent Variable	Constant	Log (GDP)	AR (1)	Adjusted R^2	DW
1	2	3	4	5	6
Revenue expenditure	–3.23*	1.11*	0.82*	0.99	1.67
Primary revenue expenditure	–3.51*	1.10*	0.74*	0.99	1.60
Capital expenditure	2.94*	0.36*	0.54*	0.72	1.85
Capital outlay	–2.93	0.89*	0.80*	0.92	2.24
Total expenditure	–1.46**	0.96*	0.77*	0.99	1.63
Developmental expenditure	–3.38*	1.05*	0.84*	0.98	1.79

Note: * and ** denote significant at 1 per cent and 5 per cent level, respectively.

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