# Is Fiscal Policy Pro-Cyclical or Counter-Cyclical ? Evidence from India

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## Abstract

This study investigated the cyclicality of fiscal policy in India at the Centre, State, and combined Centre - State level by employing three alternative methods. The period of analysis extended from 1970-71 to 2013-14. In general, the study finds pro-cyclicality behavior of expenditure in case of India. Revenue expenditure, primary revenue expenditure, capital outlay, and total expenditure were found to be pro-cyclical at the Centre and combined Centre - State level. Capital outlay was found to have more pro-cyclicality as compared to other expenditure categories both at the Centre and combined Centre - State level. However, at the State level, capital outlay was not found to have any cyclical relation with output.

*Keywords :* business cycles, fiscal policy, public spending, econometrics

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Fiscal cyclicality indicates whether the revenue and expenditure of a government change in the same direction or in the reverse direction with output. When the fiscal policy becomes expansionary in a situation of economic boom and contractionary at the time of economic recession, then the fiscal policy is said to be pro-cyclical. On the other hand, if fiscal policy is contractionary in the boom phase of the economy and expansionary during economic slump, then the fiscal policy is regarded to be counter-cyclical or acyclical. In the wake of the recent global meltdown, the issue of cyclicality of fiscal policy regained momentum. To counter the crisis and revamp growth, many developed countries, including the U.S.A and developing countries resorted to large-scale bailouts. It acted as a booster for the corporate as well as financial sectors. Various stimulus packages were given in the form of reducing tax rate and increasing public spending in the OECD countries. To rebuild the economy, the Central governments of many countries made huge investments in infrastructure and used fiscal transfer mechanism. Besides, the emerging market economies (EMEs) were also required to adjust their monetary and fiscal policy so as to moderate the impact of the crisis. The Government of India also resorted to the counter-cyclical policy of tax cuts and increase in public expenditure to check the slowdown in economic activity.

Against this backdrop, the current paper attempts to examine the cyclicality of government expenditure in India at the Centre and State and combined Centre - State level during 1970-71 to 2013-14. To cater to this objective, cyclicality of various components of expenditure was examined using three alternative methods.

## Review of Literature

As per the Neo-classical and Keynesian frameworks, ideally the fiscal policy should be counter-cyclical in

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nature, that is, decrease in fiscal deficit with an expanding economy and increase during the time of economic recession. In a neo-classical framework, Barro (1979) suggested the tax smoothing hypothesis, where budget surplus would be pro-cyclical for a given level of public expenditure. According to Barro, during the upturn of the economy, more tax revenue is generated for a given tax rate that leads to budget surplus. This premise is based upon exogenous nature of public expenditure as put forward by the neo-classical framework (Blanchard & Fischer, 1989 ; Lucas & Stokey, 1983 ; Taylor & Woodford, 1999). However, Keynes argued for counter cyclical fiscal policy with a discretionary cut in tax rate along with an increase in public expenditure during the down turn of the economy. Empirical works by various economists point to the fact that fiscal policies in advanced economies are counter-cyclical, while it is pro-cyclical in developing countries. It is because of the fact that the developed countries usually experience fiscal surplus and can undertake counter-cyclical measures. The findings of Gali (1994) and Kaminsky, Reinhart, and Vegh (2004) revealed the existence of counter-cyclical behavior of fiscal policy in advanced OECD countries. However, others found no noticeable pattern between government spending and economic growth (Fiorito, 1997; Gavin & Perotti, 1997). Lane (2003) and Talvi and Vegh (2005) produced evidence of pro-cyclical behavior of fiscal policy in developing countries. The nature of public spending being pro-cyclical in developing countries and anti-cyclical in developed countries is confirmed by Halland and Bleaney (2011). The study by Ilzetzki and Vegh (2008) reported that fiscal policies in developing countries are pro-cyclical as well as expansionary, which aggravates the business cycle by moving apart from stabilization. This type of pro-cyclical fiscal policy which aggravates fluctuations in output could hamper the fiscal sustainability (Ferranti, Guillermo, Gill, & Serven, 2000 ; Gavin, Hausmann, Perotti, & Talvi, 1996). Recent studies have examined the cyclicality of expenditure by extending it to the sub-national level (Arenna & Revilla, 2009 ; Rodden & Wibbels, 2010; Sturzenegger & Werneck, 2006).

The differences of cyclicality behavior in developed and developing countries are explained in various ways. One of the explanations was the credit restriction hypothesis, wherein developing countries lack in accessing funds both in external and internal markets during recession cannot undertake counter-cyclical fiscal measures (Caballero & Krishnamurthy, 2004 ; Calderon & Schmidt-Hebbel, 2008 ; Gavin & Perroti, 1997). Talvi and Vegh (2005) mentioned that due to political pressure of interest groups and rent seekers, the developing countries cannot reduce public spending in good times. On the other hand, during recession, expenditure cannot be expanded due to low surplus of the sovereign during good time.

So far as cyclicality of components of government revenue and expenditure is concerned, they do differ within as well as across countries. Tax revenue is regarded as a built-in automatic stabilizer. It is because GDP acts as the taxable base that ensures counter-cyclicality between GDP and tax revenue. Another component of revenue is fiscal transfers which is also a built-in-stabilizer. During expansion, the number of claimants tend to fall, while during recession, the opposite is expected. By taking data from 27 states of Brazil for the period from 1991 to 2006, Arenna and Revilla (2009) found that the degree of pro-cyclicality of expenditures on personnel expenditure is higher than maintenance and capital expenditure. They also showed that total and primary revenue expenditures are pro-cyclical. Keynes gave due importance to public investment as a tool to counter business cycle. Arreaza, Sorensen, and Yosha (1999) examined the cyclicality in government consumption, transfers, subsidies, and tax revenue by taking a panel data set of OECD and EU countries. According to this study, government expenditure on account of consumption is found to be weakly pro-cyclical. Granado, Gupta, and Hajdenberg (2013) examined the cyclical behavior of health and educational expenditure for 145 countries during 1987 to 2007. They found that expenditure on education and health is pro-cyclical in developing countries while it is a-cyclical in developed countries.

The majority of the studies examining the cyclicality of expenditure in India is made by the Reserve Bank of India (RBI). Mukherjee (2013) examined the cyclicality of public expenditure by the central government for the period from 1970-71 to 2012-13. He found that most of the expenditure categories are pro-cyclical except the primary revenue expenditure, capital expenditure, and non-development expenditure. The study also revealed

that capital-outlay has highest pro-cyclicality as compared to other expenditure categories. Reserve Bank of India (2013) examined the cyclicality of expenditure by the Central government as well as the general government [1]. It found higher pro-cyclicality of capital-outlay and inelasticity of primary revenue expenditure in the short-run. However, in the long-run, primary revenue expenditure is more responsive to changes in output. The study also found higher pro-cyclicality of government investment than government consumption (demand components). At the state level, Kaur, Mishra, and Suresh (2004) found pro-cyclicality of educational expenditure, but observed a-cyclical behavior of social spending as a whole by analyzing data from each 17 non-special category states separately. Kaur and Misra (2003) obtained a significant positive relationship between public spending in social sectors (education and health) and its outcome on the social sector by analyzing 15 general category states in India. Reserve Bank of India (2014) explored the cyclicality of public expenditure by taking a panel data set from 14 non-special category states of India. The study revealed pro-cyclicality of capital outlay, while primary revenue expenditure turned out to be a-cyclical.

## Annual Financial Statement

Under Article 202 (1) of the Constitution of India, a statement of estimated receipts and expenditure of the state has to be laid before the legislature for every financial year. The Annual Financial Statement constitutes the budget of the government. This statement takes into account a period of one financial year. The financial year commences in India on $1^{st}$ April each year. The statement titled "Annual Financial Statement" is the main budget document. Annual financial statement shows the receipts and payment of government under three parts in which government accounts are kept in accordance with Article 266 in the Constitution of India 1949.

**(i)** Consolidated Fund,
**(ii)** Contingency Fund and,
**(iii)** Public Account.

All revenues received by the government like loans raised by it, receipts from recoveries of loans constitute the consolidated fund. All expenses of the government are drawn from the consolidated fund and no amount can be withdrawn from the fund without authorization from the Indian parliament.

Occasions may arise when the government may have to meet urgent unforeseen expenditure pending authorization from parliament. The contingency fund is an imprest placed at the disposal of the President to incur such expenditure. Parliamentary approval for such expenditure and for withdrawal of an equivalent amount from the consolidated fund is subsequently obtained and the amount spent from contingency fund is recouped to the fund.

Certain other transactions enter government accounts in respect of which the government acts more as a banker, like transactions related to Provident Fund, small savings of post offices etc. The money thus received is kept in public account and the connected disbursement is also made there from. Parliamentary approval is not required to operate this fund.

Money deposited in Provident Funds, small savings collections are kept in the public account. Public account funds do not belong to the government and have to be finally paid back to the persons and authorities who deposited them.

Under the Constitution, annual financial statement has to distinguish expenditure on revenue account from other expenditure of the government. It comprises of Revenue budget and Capital budget.

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[1] General government consumption includes the current expenditure of the government as documented in National Account Statistics.

*Revenue budget* comprises of the revenue receipts of government (tax revenues and other revenues) and the expenditure met from these revenues. Tax revenues consist of proceeds of taxes and other duties levied by the union. The estimates of revenue receipts shown in the Annual Financial Statement take into account the effect of various taxation proposals made in the Finance Bill. Other receipts of the government mainly consist of interest and dividend on investments made by government, fees, and other receipts for services provided by the government.

*Revenue expenditure* is incurred for the smooth functioning of government departments and various services, interest payments on debt, subsidies, etc. Broadly, the expenditure which does not result in creation of assets for the Government of India is treated as revenue expenditure. All grants given to state governments/union territories and other parties are also treated as revenue expenditure, even though some of the grants may be used for creation of assets.

*Capital budget* consists of capital receipts and capital payments. *Capital receipts* are loans raised by government from the public called market loans, borrowings by government from Reserve Bank and other parties through sale of Treasury Bills, loans received from foreign governments and bodies, disinvestment receipts and recoveries of loans from state and union territory governments and other parties.

*Capital expenditure* comprises of expenditure on acquisition of assets like land, buildings, machinery, equipment, as also investments in shares, etc., and loans and advances granted by central government to state and union territory governments, government companies, corporations and other parties. *Capital outlay* is capital expenditure net of loans & advances which creates capital assets for the economy.

In the *annual financial statement*, estimate for a particular financial year in this memorandum means that the budget for the current year is passed by the legislature. Revised means estimates of receipts and expenditure for the current year as now modified on the basis of actual figures for part of the current year and estimated figures for the remaining part of the current year. Budget means the receipt and expenditure estimated for the next year. The actual data of the current year is audited by the Comptroller & Auditor General (CAG) of India and known as "Accounts" data. CAG is the authority by the Government of India Act, 1971 to compile "Accounts" data both at national and state level.

In our study, we deal with only *Consolidated Fund* as it contains all components of expenditure of both Centre and State governments. These expenditures are *accounts data* audited by the CAG, India.

## Components of Expenditure

Empirical papers are mainly concentrated in examining the cyclicality of public spending and the cyclicality of revenue is ignored. It is due to the fact that data on tax revenue and tax rates are unavailable for many underdeveloped nations. This paper tries to explore the cyclicality of major components of Central as well as the State governments' expenditure in India by extending the work of Mukherjee (2013).

The total expenditure of the government is classified into revenue expenditure and capital expenditure. The sum total of these components constitutes total expenditure. The major heads and sub-heads of expenditure of the Central government is presented in the Table 1. It is observed that the share of revenue expenditure to total expenditure has been increasing over the years, that is, from 55.65% in 1970-71 to 88.18% in 2014-15. Three major components of revenue such as expenses made in defense, interest payments, and subsidies constitute half of the total revenue expenditure. The share of revenue component of defense expenditure slowed down, while the share of interest payments and subsidies continued to stay at a higher level.

The share of capital expenditure in total expenditure at the Central government level declined from 44.35% in 1970-71 to a low level of 11.82% in 2014-15. The Central government expenditure in terms of repayment as well as disbursement of loans and advances remained a major component of capital expenditure till the 1990s. Afterwards, it declined significantly because of the establishment of National Small Savings Fund (NSSF) in the

**Table 1. Major Heads of Expenditure of the Central Government  (% of Total Expenditure)**

| Year | Revenue Expenditure | | | | Capital Expenditure | | |
|---|---|---|---|---|---|---|---|
| | Defense | Interest Payments | Subsidies | Total | Loans & Advances | Capital Outlay | Total |
| 1970-71 | 18.71 | 10.78 | 1.67 | 55.65 | 27.6 | 16.75 | 44.35 |
| 1980-81 | 14.40 | 11.44 | 8.91 | 63.29 | 23.21 | 13.50 | 36.71 |
| 1990-91 | 10.33 | 20.42 | 11.55 | 69.82 | 18.66 | 11.52 | 30.18 |
| 2000-01 | 11.44 | 30.50 | 8.24 | 85.33 | 7.07 | 7.60 | 14.67 |
| 2010-11 | 7.69 | 19.55 | 14.48 | 86.92 | 2.09 | 10.99 | 13.08 |
| 2011-12 | 7.90 | 20.94 | 16.71 | 87.84 | 1.59 | 10.57 | 12.16 |
| 2012-13 | 7.89 | 22.20 | 18.23 | 88.17 | 1.47 | 10.36 | 11.83 |
| 2013-14 | 7.98 | 24.00 | 16.33 | 87.97 | 1.23 | 10.80 | 12.03 |
| 2014-15 | 8.22 | 24.19 | 15.52 | 88.18 | 1.76 | 10.07 | 11.82 |

Source: Reserve Bank of India. (2016). Handbook of statistics in Indian economy.

**Table 2. Expenditure Pattern of State Governments  (% of Total Expenditure)**

| Year | Revenue Expenditure | Capital Expenditure | Capital Outlay | Loans & Advances |
|---|---|---|---|---|
| 1970-71 | 65.52 | 34.48 | 10.75 | 9.49 |
| 1980-81 | 65.34 | 34.66 | 14.12 | 10.8 |
| 1990-91 | 78.8 | 21.2 | 10.13 | 6.32 |
| 2000-01 | 84.7 | 15.3 | 8.9 | 2.68 |
| 2010-11 | 80.46 | 19.54 | 13.11 | 1.62 |
| 2011-12 | 79.5 | 20.5 | 12.67 | 2.88 |
| 2012-13 | 80.28 | 19.72 | 12.59 | 1.95 |
| 2013-14 | 80.87 | 19.13 | 12.93 | 1.41 |
| 2014-15 RE | 80.42 | 19.58 | 14.64 | 1.12 |

Note: RE signifies Revised Estimates.

Source: Reserve Bank of India. (2016). Handbook of statistics in Indian economy.

public account with effect from April, 4, 1999. Prior to April 4, 1999, both disbursement of loans against small savings made to the states and repayment of such loans were recorded as part of the capital expenditure in the consolidated fund of India. Though the share of capital outlay decreased from 16.75% in 1970-71 to 7.60% in 2000-01, it remained at the level of 10% since 2010-11.

The pattern of expenditure by the State governments is quite similar to the Central government expenditure in that the revenue expenditure of State governments constitutes 80% of the total expenditure (Table 2), but it is less than the share of revenue expenditure to total expenditure of the Central government. The higher level of revenue expenditure is mainly explained by non-plan grants and plan assistance to sub-national governments. As a result, the share of both capital expenditure and capital outlay are slightly high for State governments as compared to that of the Central government. It is noticeable that the share of capital outlay is gradually increasing, which indicates the emphasis on capital formation at the State level.

To study the cyclicality aspects, four variants of expenditures are taken for the Centre, State, and combined Centre - State governments. These expenditures include revenue expenditure, primary revenue expenditure (revenue expenditure excluding interest payments), capital outlay, and total expenditure.

## Methodology and Data

To measure the cyclicality of fiscal policy, various methods are suggested in literature. The simplest method to measure is to estimate the correlation between the cyclical component of output and that of the required expenditure variable (Kaminsky et al., 2004 ; Mukherjee, 2013 ; Talvi & Vegh, 2005). Generally, the cyclical part of both expenditure variable and output is taken out by using the Hodrick Prescott (HP) filter. But this method is not applicable when variables have different levels of dispersion or volatility (Akitoby, Clements, Gupta, & Inchauste, 2004 ; Forbes & Roberto, 1998). To get rid of this issue, alternatively regression method was used, which is believed to be more accurate (Lane, 2003 ; Mukherjee, 2013 ; Woo, 2009). In the literature, various measures of the expenditure variable were taken to estimate cyclicality. While some used the growth rate of the expenditure variables, others took the ratio of first difference of the ratio of expenditure variable to GDP. The cyclicality of output is also measured in alternative ways. Two common forms are the growth rate of output and the output gap (measured by the deviation of actual output from potential output).

In this paper, three alternative approaches have been applied to examine the cyclicality of the chosen expenditure variables in India. A brief description of each method is provided as follows.

### (1) Measuring Fiscal Cyclicality

**(i) Correlation - Based Method :** In this method, simple correlation between cyclical parts of various components of government expenditure and cyclical component of output is estimated through HP filter. If the correlation coefficient is found to be significantly positive (negative) then the fiscal cyclicality is regarded to be pro (counter) cyclical.

**(ii) Elasticity-Based Method :** This method involves calculation of the elasticity of each of the selected components of expenditure with respect to output through time series linear regression. As per Lane (2003), the following regression equation is estimated to measure the elasticity coefficient :

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

where, $G$ and $Y$ are real government expenditure and real GDP, respectively. $D$ represents the first difference of the relevant variable. $\alpha$ and $\varepsilon$ represent the intercept and error term, respectively. $\beta$ signifies the elasticity and cyclical coefficient. If it turns out to be positive and statistically significant, then the cyclical behavior is pro-cyclical. Otherwise, it will be treated as countercyclical.

**(iii) Error Correction Method :** The error correction approach distinguishes between short-run or temporary as well as long-run or steady state relationship between the variables. As suggested by Akitoby et al. (2004), in this approach, co-movements between the select components of expenditure and output are estimated by two step procedure to estimate both short-run and long-run cyclical behavior of expenditure. In this model, it is assumed that there is a long term relationship between government expenditure and output such that :

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

In logarithmic form, equation (2) can be represented as follows :

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

where, $\alpha = \log A$. Here, $\delta$ measures the long-term elasticity coefficient of government expenditure with respect to

output. The fundamental assumption of this model is that any deviation of $G$ from its steady state $\overline{G}$, will be corrected slowly for coming back to the steady state for any transitory changes in output. This gradual move of government expenditure is captured by Akitoby et al. (2004) with the specification of a general autoregressive distributed lag model for the government expenditure variable as follows :

$$\log G_t = \mu + \alpha \log G_{t-1} + \beta_0 \log Y_t + \beta_1 \log Y_{t-1} + \varepsilon_t, \quad |\alpha| < 1 \qquad (4)$$

Equation (4) can be solved for the steady state equilibrium by assuming that output is also at its stead state level ($\overline{Y}$), and ignoring the residual term, we have :

$$\log \overline{G} = \frac{\mu}{1-\alpha} + \left\{ \frac{\beta_0 + \beta_1}{1-\alpha} \right\} \log \overline{Y} \qquad (5)$$

To capture the steady state, the above equation can be rearranged in error-correction form,

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

Here, $\beta_0$ measures the short-run elasticity, while $\delta$ captures the long-run elasticity of government expenditure with respect to output. $\gamma$ is the coefficient of error-correction term which measures the speed of adjustment of the government expenditure to its steady-state level. If this term turns out to be negative and significant, then the government expenditure and the output variables are said to be cointegrated or having a long-run relationship. If the cointegration relationship holds well, then a simple OLS regression as given in equation (3) will give the long-run elasticity of expenditure with respect to the output.

**(2) Data Sources :** Time series data on GDP, expenditure components of Central government and State governments which are part of the consolidated fund of the annual financial statement were collected for the period from 1970-71 to 2013-14 from the *Handbook of Statistics on Indian Economy* published by the Reserve Bank of India. All the nominal data of expenditure variables are deflated by the GDP deflator at 2004-05 prices to arrive at their real figures. The fiscal variables of Centre as well as the State governments are added to arrive at the combined expenses made by the government.

## Results and Discussion

**(1) Correlation - Based Method :** The estimated correlation coefficients between cyclical part of government expenditure and output for the period from 1970-71 to 2012-13 are delineated in the Table 3.

### Table 3. Correlation Based Measure of Cyclicality

| Expenditure Items | Correlation Coefficient | | |
|---|---|---|---|
| | Centre | State | Combined |
| Revenue Expenditure | 0.412* | 0.258*** | 0.380** |
| Primary Revenue Expenditure | 0.405* | 0.312** | 0.404* |
| Capital Outlay | 0.482* | 0.221 | 0.457* |
| Total Expenditure | 0.432* | 0.147 | 0.355** |

Note: *, **, and *** indicate significant at 1%, 5%, and 10% level.

## Table 4. Phillips - Perron Unit Root Test

| Variables | with intercept | | with intercept and trend | |
|---|---|---|---|---|
| | Level | First Difference* | Level | First Difference* |
| Gross Domestic Product | 4.164 | -5.952 | -2.085 | -8.628 |
| Centre | | | | |
| Revenue Expenditure | -0.583 | -5.894 | -2.933 | -5.811 |
| Primary Revenue Expenditure | -0.257 | -5.846 | -2.009 | -5.817 |
| Capital Outlay | -0.169 | -8.334 | -2.121 | -8.342 |
| Total Expenditure | -0.362 | -6.476 | -2.890 | -6.388 |
| State | | | | |
| Revenue Expenditure | -0.084 | -6.774 | -3.159 | -6.708 |
| Primary Revenue Expenditure | 0.075 | -6.137 | -2.305 | -6.103 |
| Capital Outlay | -0.195 | -6.309 | -1.594 | -6.262 |
| Total Expenditure | 0.618 | -7.755 | -3.075 | -7.887 |
| Combined | | | | |
| Revenue Expenditure | -0.394 | -6.155 | -2.992 | -6.081 |
| Primary Revenue Expenditure | -0.094 | -5.836 | -2.079 | -5.815 |
| Capital Outlay | 0.100 | -6.693 | -1.462 | -6.706 |
| Total Expenditure | -0.011 | -7.008 | -2.893 | -6.961 |

Note: * denotes significant at the 1% level.

## Table 5. Regression Results for Cyclicality Coefficients

| Dependent Variable | Constant | D log (GDP) | AR(1) | R-Square | DW |
|---|---|---|---|---|---|
| Centre | | | | | |
| Revenue Expenditure | 0.03 | 0.67** | 0.11 | 0.11 | 1.92 |
| Primary Revenue Expenditure | 0.02 | 0.75** | 0.10 | 0.11 | 1.95 |
| Capital Outlay | - 0.10** | 2.69* | -0.23 | 0.28 | 2.04 |
| Total Expenditure | -0.01 | 1.10* | 0.13 | 0.21 | 1.96 |
| State | | | | | |
| Revenue Expenditure | 0.03*** | 0.63** | 0.10 | 0.16 | 2.04 |
| Primary Revenue Expenditure | 0.03** | 0.60** | 0.14 | 0.15 | 2.00 |
| Capital Outlay | 0.03 | 0.70 | 0.05 | 0.05 | 1.98 |
| Total Expenditure | 0.03*** | 0.56** | - | 0.09 | 2.01 |
| Combined | | | | | |
| Revenue Expenditure | 0.03*** | 0.66** | 0.13 | 0.16 | 2.00 |
| Primary Revenue Expenditure | 0.03 | 0.67** | 0.14 | 0.16 | 2.02 |
| Capital Outlay | -0.05 | 1.84* | 0.04 | 0.24 | 1.90 |
| Total Expenditure | 0.01 | 0.92* | 0.10 | 0.21 | 2.00 |

Note: AR (1) model is fitted wherever required to correct for autocorrelation; Figures in parenthesis are prob. values. *, **, and *** indicate significant at 1%, 5%, and 10% level.

All the expenditure categories for the Central government and combined Central-State government level are found to be pro-cyclical as the correlation coefficients turn out to be positive and statistically significant. At the State level, revenue expenditure and primary revenue expenditure are found to be pro-cyclical with 10% and 5% level of significance. The correlation coefficient between capital outlay and output and between total expenditure and output turn out to be insignificant at the State level. However, the positive correlation among them hints at pro-cyclicality.

**(2) Elasticity - Based Method :** Prior to any kind of regression analysis, stationary properties of all the variables are tested by conducting the Phillips-Perron unit root test (Phillips & Perron, 1988). It is due to the fact that any kind of regression analysis with non-stationary variables will give spurious results. The Phillips-Perron Unit root test is superior to ADF-test in that it combats the auto-correlation and heteroscedasticity problem of the errors in a distinct way. It applies a non-parametric auto-regression to approximate the autoregressive moving average structure of the errors in the test regression by ignoring any serial correlation in the test regression. The results of the unit root test are presented in the Table 4 indicating that all the variables are non-stationary at level, but stationary at first difference. So, all the variables are integrated of order one. Therefore, regression analysis should be done by taking the first difference of the variables as provided in equation (1).

Equation (1) is estimated using the OLS Method with a first order auto-regressive term (wherever required) to deduce the cyclical coefficient of component of government expenditure and total expenditure. The cyclical coefficient is nothing but the elasticity of growth of particular expenditure category with respect to growth in output. The elasticity measure for each expenditure variable at various levels is given in the Table 5. The results indicate that all the expenditure variables are pro-cyclical, except the capital outlay variable at the state level. This may be because of availability of less funds with the State governments to finance capital outlay both in upturn and downturn. The coefficient of capital outlay is found to be statistically significant with the value 2.69 and 1.84 for the Centre and combined Centre - State level. These values imply that at both Central level and combined Centre - State level, the change in the capital outlay happened to be proportionately more than the change in output. This implies that the capital outlay is more sensitive to change in output. The coefficient of the capital outlay is very high as compared to other categories of expenditure reflecting the fact that capital outlay exhibits more pro-cyclicality. This may be due to availability of more surplus resources to finance capital outlay after financing committed expenditure during the upturn. During the down turn of the economy, less resources may be available after financing the committed revenue expenditure. In case of the centre, the elasticity of primary revenue expenditure with respect to output is found to be higher than the elasticity of revenue expenditure. This implies that the expenditure on interest payment is neutral to cyclicality. This may be attributed to the nature of expenditure on account of interest payments, which is contractual in nature with a fixed schedule of payment. However, at the State level, the elasticity of primary revenue expenditure is lower than the elasticity of revenue expenditure which indicates the stickiness of revenue expenditure excluding interest payments. At the State level, interest payment expenses are cyclical as contrast to the Centre because the State has very few discretionary powers in borrowing and less control over interest payments.

Since the elasticity coefficient of all categories of expenditure at the Central level is more than that of Sate and combined Centre - State level, the degree of pro-cyclicality of expenditures at the centre is higher than the State and combined Centre - State levels.

**(3) Error Correction Approach :** To distinguish between the short-run and long-run elasticity, equation-6 has been estimated by employing the OLS technique. The long-run elasticity is found by estimating equation (3). The regression results are given in the Table 6. The error correction term ($\gamma$) is found to be significant (at least at the 5% level) for all the expenditure categories at the Centre. This implies existence of long-run relationship between the expenditure categories and output. At the State and combined Centre-State level, revenue expenditure and capital

**Table 6. Long-run and Short-run Elasticity of Expenditure**

| Expenditure Items | Short-run Elasticity | Long-run Elasticity | Error Correction Term |
|---|---|---|---|
| Centre | | | |
| Revenue Expenditure | 0.63*** | 1.22* | -0.16** |
| Primary Revenue Expenditure | 0.70*** | 1.15* | -0.25* |
| Capital Outlay | 2.69* | 0.76* | -0.22** |
| Total Expenditure | 0.97* | 1.01* | -0.22** |
| State | | | |
| Revenue Expenditure | 0.56** | 1.18* | -0.11*** |
| Primary Revenue Expenditure | 0.53** | 1.14* | -0.15** |
| Capital Outlay | 0.69 | 1.09* | -0.14*** |
| Total Expenditure | 0.67** | 1.20* | -0.22** |
| Combined | | | |
| Revenue Expenditure | 0.59** | 1.20* | -0.12*** |
| Primary Revenue Expenditure | 0.61** | 1.14* | -0.20** |
| Capital Outlay | 1.70* | 0.93* | -0.13*** |
| Total Expenditure | 0.83* | 1.05* | -0.21** |

Note: *, **, and *** indicate significant at 1%, 5%, and 10% level.

outlay are found to have a long-run relationship with output at a lower level of significance, that is, at 10%. The short-run elasticity of revenue expenditure and primary revenue expenditure are lower than their long-run elasticity at all levels, signifying the difficulty of adjustment of such expenditures with business cycle fluctuations in the short-run. At the combined Centre-State level also, the short-run elasticity of total expenditure is less than its long-run elasticity.

All the coefficients of elasticity of expenditure with respect to output in the long run are positive, reflecting the pro-cyclicality of expenditure in India. This validates the results of our previous two alternative models. However, in the short-run, coefficient of capital-outlay is not significant at the State level ; whereas, it is significant for the Centre and combined Centre - State level. This may be due to capital outlay component of both plan and non-plan assistance to States, which drives pro-cyclicality. Further, the short-run elasticity of capital outlay with respect to the output is found to be more than the long-run elasticity at both the Centre and combined Centre - State level, suggesting more flexibility of changing capital outlay in the short-run than in the long-run.

## Conclusion

The results of the study reveal that though the government expenditure in India is mostly pro-cyclical, the degree of cyclical varies among the entities such as Centre, State, and combined Centre - State level. The degree of cyclicality also differs across various components of expenditure considered in the study. The correlation based approach indicates that revenue expenditure, primary revenue expenditure, capital outlay, and total expenditure are pro-cyclical in nature at the Centre and combined Centre - State level. However, only revenue expenditure and primary revenue expenditure turned out to be pro-cyclical at the State level. The results from the regression method are almost similar to the correlation-based measure, that is, all the expenditure categories are pro-cyclical except the capital outlay variable at the State level. To distinguish the short-run and long-run elasticity, error correction approach is also applied in the analysis. In the long-run, all the expenditure categories are found to be pro-cyclical at all levels. However, in the short-run capital outlay for the State level is not significantly pro-

cyclical. For the Centre and combined Centre - State analysis, capital outlay was found to be more pro-cyclical than the rest of the expenditure measures taken in the analysis, which is in conformity with the results obtained by Mukherjee (2013), Reserve Bank of India (2013), and Reserve Bank of India (2014). In the long-run, primary revenue expenditure is found to be more pro-cyclical than other expenditure categories in Centre and combined level. At the State level, the pro-cyclicality of total expenditure was found to be highest. From the above analysis, it is broadly established that both the Centre and State governments in India adopt pro-cyclical expenditure.

## Policy Prescription

The pro cyclicality behavior of the public expenditure induces systemic risk. As the fiscal policy and the conditions in the financial sector are intertwined, during worsening of the financing sector, the pro-cyclicality nature of fiscal policy further dampens the economic condition. During favourable situation in the financial sector, which is more prominent in good times, fiscal profligacy is encouraged. To counter any financial crisis, the nature of fiscal policy should be counter cyclical. During the good times of the financial sector, this counter cyclical fiscal policy would help in less fiscal intervention through less borrowings and less expenditure by reducing the size of the budget. The buoyancy in revenue of the government may properly be invested in suitable financial instruments through proper asset liability management. Hence, to check the pro-cyclical behavior of the public expenditure, Fiscal Responsibility and Budget Management (FRBM) Bill was enacted in 2003 at both the Centre and State level. The main objective of the FRBM Act is to ensure long run macro-economic stability, better coordination with the financial sector, and to avoid any conflict between fiscal policy and monetary policy. FRBM Act is a set of fiscal rules mainly pertaining to expenditure and borrowings to prevent the pro-cyclical behavior of the fiscal policy of India.

The pro-cyclical behavior in the financial system creates systemic risk that leads to a crisis. This has made the policy makers to come out with various frameworks and tools to address the pro-cyclicality of the financial system. Therefore, Basel III has recommended counter cyclical capital conservation buffer to avoid the creation of systemic risk. In accordance with Basel III norms, banks in India have to maintain counter cyclical capital buffer by 2018. The proximate objective of counter cyclical capital buffer is to make banks build up capital buffers in good times that can be drawn down to combat during the down turn. This counter cyclical buffer is the unencumbered capital in excess of that minimum, so that capital is available to absorb unexpected losses during a downturn. Counter cyclical policy is to be adopted by banks in accordance with Basel III norms, and counter cyclical fiscal policy can be thought of having two closely related ultimate objectives. The one is to limit the banking system amplifying economic fluctuations with the help of counter cyclical fiscal policy. The other one is to have better co-ordination among fiscal policy, monetary policy, and financial system as a whole so as to reduce the systemic risk.

## Limitations of the Study and Scope for Further Research

The methodology applied in the current paper to measure the cyclicality of various categories of expenditures is very simple. However, it did not explore the determinants of cyclicality of government expenditure. Further, one can examine the cyclicality of public spending by classifying various states of India into low income, middle income, and high income states. Cyclicality of other expenditure categories like expenses made in education and health can be looked into. Keeping the limitations of the study in mind, one can extend the analysis to make appropriate policy decisions.

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