Research Paper

Impact of fiscal deficit on economic growth in India: A cointegration analysis

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ABSTRACT : Objectives: To investigate the long run and short run relationship between fiscal deficit and economic growth in Indian economy. **Methods and statistical analysis:** The study is based on secondary data; objective of the study is examined using time series data from the period 1980-81 to 2013-14. **Findings:** The Johansen methodology concludes an existence of a one cointegrating relationship among gross domestic product, fiscal deficit, gross domestic capital formation and employment. The finding of the study indicates that one per cent increase in fiscal deficit is likely to decrease Gross domestic product by 0.618609 thus, it shows there is a negative relationship between Gross domestic product and fiscal deficit in the long run. But the Vector Error Correction model discards the short run relationship between fiscal deficit and economic growth. **Application/improvements**: Fiscal deficit hampered the economic growth in the long run hence gap between the government revenue and government expenditure should be minimized.

KEY WORDS : Economic growth, Fiscal deficit, Gross domestic product, Gross domestic capital formation, Employment

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INTRODUCTION :

In India, gross fiscal deficit is defined as the excess of the sum of revenue expenditure, capital outlay and net lending over revenue receipts and non-debt capital receipts including the proceeds from disinvestment. The government has to incur deficits to finance when its revenue and expenditure mismatches and also to finance investments. The problem arises when the deficit level becomes too high and chronic. The ill-effects of high deficits are linked to the way they are financed and how it is used. The fiscal deficits can be financed through domestic borrowing, foreign borrowing or by printing money. Government expenditure on goods and services and resources mobilized by it through taxes, etc., are important factors that determine aggregate demand in the economy. When there is a deficit in the budget of the government, it spends more than it collects resources through taxes and non-tax revenue. Among the mainstream analytical perspectives, the neo-classical view considers fiscal deficits unfavorable to investment and economic growth, while in the Keynesian paradigm, it constitutes a key policy prescription. Theorists persuaded by Ricardian equivalence assert that fiscal deficits do not really matter except for smoothening the adjustment to expenditure or revenue shocks. While the neo-classical

and Ricardian schools focus on the long run, the Keynesian view emphasizes the short run effects. Fiscal deficit affects economic growth adversely and the negative impact of the budget deficit on the economic growth is because governments are short of the resources to meet their expenses in the long run (Fatima *et al.,* 2012). There is negative and significant relationship between fiscal deficit and economic growth in the long run. One per cent increase in Fiscal deficit is likely to decrease gross domestic product by 0.216537 per cent. But the result discards the short run relationship between fiscal deficit and economic growth (Kumar and Mohanty, 2012) with this background the present study undertaken with the specific objective: to find out the long run and short run association between fiscal deficit and economic growth in Indian economy.

MATERIALS AND METHODS :

The study is entirely based on secondary data from the period 1980-81 to 2013-14. The time series data is obtained from the various reports and websites. All the variables are converted to natural logarithm. The objective of the study is examined using Unit root test (ADF test), Cointegration test and Vector error correction model technique.

Econometric specification :

The study has used the following model in order to estimate the impact of fiscal deficit on economic growth here Gross Domestic Product (GDP) is taken as a proxy for economic growth.

GDP= *f* (Fiscal deficit, Gross domestic capital formation, Employment)   eq 1

The estimated model is in the following form

GDP= r_1+ r_2 **FISDEF**+ r_3 **GDCF**+ r_4 **EMP** +~

The estimated long run log model is of the of the following form

LNGDP= r_1+ r_2 **LNFISDEF**+ r_3 **LNGDCF**+ r_4 **LNEMP** +~

where,

LNGDP= Natural log of gross domestic product at market prices

LNFISDEF= Natural log of fiscal deficit

LNGDCF= Natural log of gross domestic capital formation

LNEMP= Natural log of employment in public and organized private sector

μ = Error term

α_1 is intercept and α_2, α_3 and α_4 are the co-efficients or parameters of the corresponding variables.

RESULTS AND DATA ANALYSIS :

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Testing for unit roots (Augmented dickey fuller):

To investigate the order of integration among the variables Augmented Dickey Fuller test has used by taking Null hypothesis as 'presence of unit root' (*i.e.* presence of non-stationary) against the alternative hypothesis 'presence of stationary'. If the p value is less than 0.05 then rejects the Null hypothesis and concludes that the series is stationary and *vice-versa*. It is clear from the Table 1 that the Null hypothesis of no unit roots for all the time series are rejected at their first differences since the ADF statistic values are less than the critical values at one per cent levels of significances Thus, these variables are stationary at first difference and integrated of same order, *i.e.*, I (1). Thus, it is cleared that all the variables have unit root in their level form but at first difference the variables became stationary (Table 1).

To understand the long run relationship among the variables the study used johansen cointegration test. The results suggest that the optimal lag length is one and cointegration results are presented in Table 2. Both the trace statistics and maximum eigen values rejects the

Table 1 : Results of augmented dickey fuller

Column1variables	Column l Level mn 2 Level		First difference Column 2 Level LLLLLL	
	Constant	Constant and trend	Constant	Constant and trend
LNGDP	1.8289 (0.9996)	-1.292 (0.8724)	-4.7052 (0.0007)	-5.1882 (0.0010)
LNFISDEF	-2.1577 (0.6645)	-3.438 (0.0665)	-5.848 (0.0000)	-5.743 (0.0003)
LNGDCF	1.2203 (0.9976)	-1.9327 (0.6150)	-6.054 (0.0000)	-4.794 (0.0032)
LNEMP	-1.231 (0.6486)	-2.745 (0.2268)	-3.739 (0.081)	-3.648 (0.0413)

Note: The values in parenthesis indicate the level of significance at 1 per cent

Table 2 : Results of johansen cointegration test

No. of CE(s)	Eigen value	Trace statistics	0.05 critical value	Max-eigen statistics	0.05 critical value
None*	0.5783	49.5805	47.8561	27.6324	27.5843
At most 1	0.4335	21.9481	29.7907	18.1860	21.1316
At most 2	0.1046	3.7620	15.4947	3.53824	14.2646
At most 3	0.0066	0.2237	3.84146	0.22379	3.84146

Note: Maximum eigen value and Trace statistics indicates 1 cointegration equation at the 5 per cent level, * indicates rejection of Null hypothesis at 5 per cent level

Table 3 : Results of VECM model

Regressors	Co-efficients
LNFISDEF	-0.6186
	-0.0758
	{-8.1608}
LNGDCF	0.0034
	-0.083
	{0.0414}
LNEMP	1.6064
	-0.6425
	{2.4999}

Note: value in ( ) indicates standard error value and value in the { } indicates the t statistic value

Table 4 : Results of wald test

Test statistic	Value	df	Probability
F statistic	0.3745	(4,26)	0.8246
Chi sqaure statistic	1.4982	4	0.8270

Null hypothesis of no cointegration at 5 per cent level of significance. But the Null hypothesis is accepted of one cointegration among variables at 0.05 level by both the trace statistics and maximum eigen values since these values are lower than the critical values. Hence this test concludes there is a one cointegrtion relationship among LNGDP, LNFISDEF. LNGDCF and LNEMP therefore Vector Error Correction Model is necessary to understand the long run relationship across the variables.

Estimated long run relationship :

Results from Table 3 revealed the long run relationship across the variables since the variables are in the logarithm form the co-efficients can be interpreted as long run elasticities. Fiscal deficit and employment are significant at 5 per cent level. One per cent increase in fiscal deficit is likely to decrease GDP by 0.618609 thus, it shows there is a negative relationship between GDP and Fiscal deficit and Capital formation is insignificant meaning that there is no long run relationship between GDP and Gross domestic capital formation.

Short run relationship across variables based on vector error correction model :

To estimate the short run relationship between the variables Wald test is used. The results of the test revealed that there is no short run relationship between GDP and Fiscal deficit. Since the probability value is more than 5 per cent revealing that rejection of Null hypothesis that there is no short run relationship between the variables (Table 4).

Conclusion :

The study concludes an existence of one cointegrating relationship among LNGDP, LNFISDEF, LGDCF and LNEMPL. Hence, it reflects that there is a long run relationship between GDP and fiscal deficit. The findings of the study indicate that there is a negative and significant relationship between fiscal deficit and economic growth in the long run. But the vector error correction model discards the short run relationship between fiscal deficit and economic growth.

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