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Fiscal deficit, private sector investment and crowding out in India

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ABSTRACT

This paper examines the effect of fiscal deficit on private sector investments in India considering a time series data set for the period 1981-82 to 2011-12. Augmented Dickey-Fuller(ADF) unit root test is used to test the stationarity of the variables. Variables are found to be integration of order one. Johansen maximum likelihood approach is applied to verify the co-integration or long-term equilibrium relationship between private sector investment and other variables. Vector Error correction mechanism is employed to verify the short run dynamics. The findings of the study suggest that fiscal deficit crowds out private investment in the long run. The speed of adjustment of private sector investment to equilibrium error is slow. In order to encourage private sector investments fiscal prudence of the government is important. Reducing fiscal deficit by minimizing the expenditure on non-developmental aspects will help to promote private sector investments.

Keywords : Fiscal deficit, crowding out of private sector investments, impact of public spending, Johansen co-integration, Augmented Dickey Fuller (ADF) test, Error Correction Mechanism(ECM).

1. Introduction

Fiscal deficit shows the borrowing requirements of the government i.e. excess expenditure over the non-debt capital receipts and revenue receipts. Though every government aims to reduce fiscal deficit but sometimes finds it difficult to reduce public expenditure due to political or economic reasons. The government expenditure is increasing year after year and also the fiscal deficit. As a result, government resorts to borrowing from internal or external sources or monetization. If the government borrows from internal sources i.e. market borrowing, it competes with private sector in obtaining funds. This increases interest rates and the private investment falls. This is the crowding out effect of public investment on private investment.

Crowding out has been classified into- real and financial crowding out (Blinder and Solow 1973). Real crowding out happens when private investment is displaced by public investment on rupee-to-rupee basis, irrespective of the mode of financing. Financial crowding out means the partial loss of private capital formation due to increasing interest rates owing to the pre-emption of real and financial resources by government through bond financing of fiscal deficit.

There is ever a debate about the relationship between public investment and private investment. Theory suggests that increase in public expenditure, financed through market borrowing, would reduce the availability of loanable funds and increase the interest rates, thus crowds out private investment. This is the argument of the Neo-classical school of thought. While the Keynesian theory argues that increased government spending leads to increased output by multiplier process, increases the interest rates too but it is neutralized by increased private investment due to increased profitability, which is itself a result of increased aggregate demand. On the other hand, according to Ricardian perspective, fiscal deficit is referred to as a method of smoothening the impact of revenue shocks. Fiscal deficit has no impact on growth of the economy as it is nothing but a mere postponement of tax burden on the future generation.

Printing of new currency will increase inflation in an economy and private sector may be motivated by an increase in nominal prices. But that will also be offset in the long run due to increase in nominal price of factors of production. Borrowing to finance the deficit will increase the interest rate and would lead to fall in private investments. Crowding out of private investments will reduce the overall investment level in a nation and severely affect growth. With increasing government spending on one side and falling private investments on the other side, the impact on the economy will be huge. So it is important to understand the impact of fiscal deficit on private sector investments which will have an impact on the economy. In this perspective the main objective of the study is to examine the short-run and long-run relationship between fiscal deficit and private investments and to see whether the fiscal deficit crowds out private sector investments in India.

Rest of the paper is divided into six sections. Section 2 summarizes some empirical results. Section 3 discusses the data and methodology. Section 4 examines the pattern of fiscal deficit and private sector investments. Section 5 provides the empirical results and discussion. Section 6 gives conclusive remarks.

2. **Literature Review**

There exists a wide literature on fiscal deficits and its impact on various macroeconomic variables such as savings, investment and inflation. Spencer and Yohe (1970) examined the economic theory from Adam Smith to Post-Keynesian regarding the influence of fiscal actions on economic

activities. He suggested crowding out of loanable funds due to government borrowing that could have been used to finance private expenditure. Easterly and Hebbel (1993) found debt financing would lead to higher interest rates thus would crowd out private investment, whereas Patnaik (2001), Mitra (2006), Bhattacharya (2009), Das (2010) and Traum and Yang (2013) ruled out such relationship. Pradhan et.al. (1990) suggested the existence of crowding out due to financing the deficit by market borrowing. Some studies in Indian context, Serven (1996), Goyal (2004), Chakroborty (2006), Mitra (2006) and Das (2010) suggested positive relationship between public and private investment i.e. crowding in effect. It is supported by some international studies, Freidman (1978) and Khan and Gill (2009), both studies found crowding in effect. International studies by Spencer and Yohe (1970) and Easterly and Hebbel (1993) found the existence of crowding out of private investment. Studies in India by Serven (1996) and Chakraborty (2006) found that in long run, public non-infrastructure expenditure would crowd out private sector investment.

Most studies used dual transmission mechanism to analyse financial crowding out. The studies suggest no crowding out of private investment in Indian context due to higher liquidity in the system. Studies that suggest existence of crowding out effect, accept the neo-classical theory that states the trade-off between public capital and private capital due to the former's mode of financing being market borrowing. The recent literature in Indian context has considered data until 2009. Further the findings of the study contradict each other and a consensus has not been reached. This gives rise a scope to further examine the issue. This paper tries to examine this relationship using recent data till 2011-12.

3. Data and Methodology

The study is based on secondary data. Times series data covering the period of 1981-82 to 2011-12 is used for examining the objectives of the paper. Data on Gross Domestic Product(GDP), Fiscal deficit of the Central Government(FDCENT) and Private Sector Investments(GDCFPVT) were collected from Handbook of Statistics on Indian economy, Reserve Bank India. All the variables have been deflated by GDP deflator and converted to 2004-05constant prices. Interest rate(IR) data for the study period was collected from the International Monetary Fund database. All variables are converted to natural log(LN).

The Augmented Dickey-Fuller(ADF) test was used to test the stationarity and identify the order of integration for the variables LNGDP, LNFDCENT, LNGDCFPVT and LNIR. The results of the test are reported in Table-1.

Table 1 : ADF Test Result

	With Constant and Trend	
Variables	**Level**	**First Difference**
LNGDP	-1.178016 (0.8977)	-4.908294 (0.0023)*
LNFDCENT	-3.498173 (0.0605)	-5.567336 (0.0005)*
LNGDCFPVT	-3.116133 (0.1148)	-8.178951 (0.0000)*
LNIR	-3.099039 (0.1241)	-5.068193 (0.0018)*
* MacKinnon (1996) one-sided p-values at 1% level of significance (crititcal value -4.284580), denotes significance at the level of 1% of null of hypothesis of non-stationarity.		

Source : Calculated from basic data from RBI and IMF.

The results of the ADF test suggest that variables are stationary at their first difference. Hence, the order of integration for these variables is I(1).

Then the variables may be co-integrated and have long-run equilibrium relationship. The Johansen maximum likelihood method is applied to verify whether any co-integrating relationship is established among the variables. As the study uses annual time series data for relatively smaller number of observations we employed co-integration using only one lag in the VAR system. The short-run adjustment in the error term is observed using Vector Error Correction Mechanism(VECM).

4. Pattern of Fiscal Deficit and Private Sector Investment

The private sector investments are the investments made by organizations owned and managed by the private players. It does not include the household investments. The pattern of fiscal deficit and private sector investments is shown in figure-1.

Figure 1: Fiscal deficit and Private sector investments

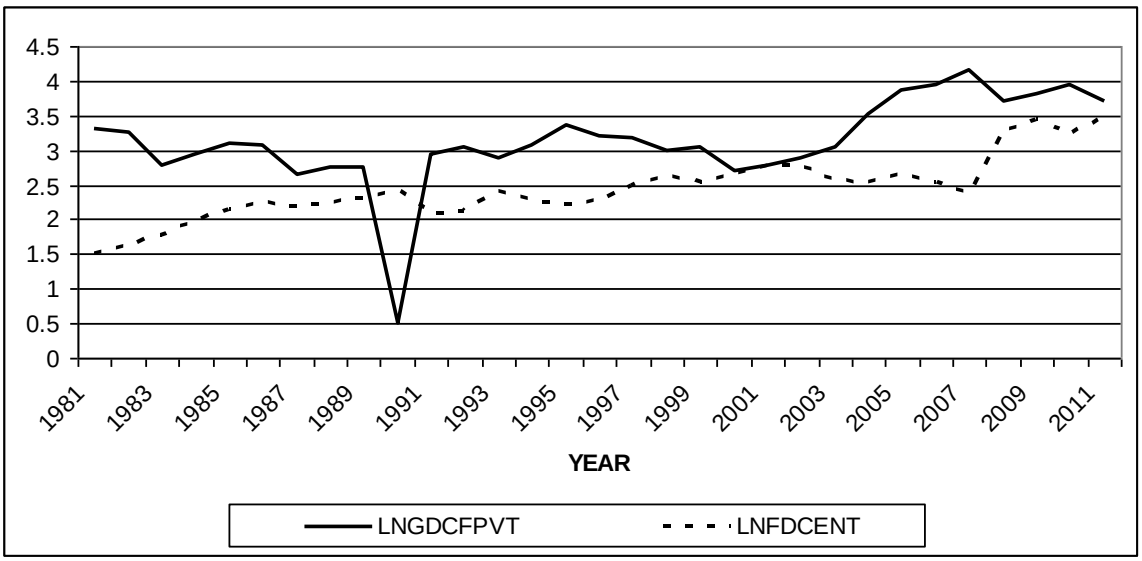

Figure 1 shows the trend of private sector investments and fiscal deficit in India(in log) during the study period. Private investments had a decreasing trend from 1981-82 and was lowest in 1990-90. After 1991-92 it has been increasing and was above the fiscal deficit except 2001-02. Fiscal deficit has been increasing from 1981-82 till 2011-12 with small fluctuations. Mostly fiscal deficit and private sector investments had opposite movements indicating that an increase in fiscal deficit is associated with adecline in private sector investments and vice versa.

5. Empirical Results and Discussions

5.1 Johansen representation of co-integration

The Johansen-maximum likelihood co-integration test results are presented in table-2.

Table 2 : Johansen Co-integration Test Result
Series: LNGDCFPVT, LNFDCENT, LNIR and LNGDP

Hypothe-sized	Eigen Value	Trace Statistic	0.05 Critical Value	Max-Eigen Value	0.05 Critical Value
None*	0.655694	65.23612	54.07904	31.98669	28.58808
At Most 1	0.370725	33.24943	35.19275	13.89559	22.29962
At Most 2	0.310868	19.35383	20.26184	11.16969	15.89210
At Most 3	0.238759	8.184145	9.164546	8.184145	9.164546

* denoted rejection of hypothesis is at the level 0.05 level
Trace Statistics indicates one co-integrating equation between the variables at five percent level of significance.

Source : Computed from basic data from RBI and IMF.

Johansen co-integration test is used to identify the co-integrating relationship between the variables. The null hypothesis of no co-integration is rejected at 0.05 level for one co-integrating equation. The trace statistic and Max-eigen statistic indicate that there is one co-integrating equation between the variables at five percent level of significance. Hence, a long run equilibrium relationship is established between these variables.

The long-run relationship between the private sector investments and fiscal deficit is shown in table-3.

Table 3 : Long Run Relationship
Dependent variable: LNGDCFPVT

	Coefficients	t
LNFDCENT	-1.12	-2.657**
LNGDP	1.41	2.99*
LNIR	-0.17	-0.18
C	-7.63	-1.26
R--squared	0.53	
Adjusted R-squared	0.48	
Durbin-Watson statistic	1.82	

Source : (Calculated from basic data): Handbook of Statistics on Indian Economy, RBI, 2012-13

The table shows the long run relationship between the variables for one co-integrating vector. There is negative and significant relationship between Fiscal Deficit and Private Investments. For one percent increase in Fiscal Deficit there is 1.12 percent fall in Private Investments. And also there is a positively significant relationship between GDP and Private sector investments, one percent increase in GDP leads to 1.41 percent increase in Private investments. Though the coefficient of interest rate is negative, but it is not statistically significant.

5.2 Short term relationship: VECM

In order to verify how the equilibrium error is adjusted in the short-run, we have employed VECM. The summary results are reported in table-4.

Table 4 : Vector Error Correction Model Results

	Coefficient	**t**
C	0.002	1.66
ECM (-1)	-0.19	2.08**
D(LNGDCFPVT(-1))	-0.335	-2.28**
D(LNFDCENT(-1))	-0.472	-0.77
D(LNGDP(-1))	0.98	0.131
D(LNINT(-1))	0.57	0.44

Source: Computed from basic data from RBI and IMF.

ECM indicates short-run relationship between variables. The error correction term coefficient or the speed of adjustment parameter coefficient is found to be -0.19. Private investment has slow response to the last period equilibrium error.

6. Conclusion and Policy Suggestions

The paper verifies the short-run and long-run relationship between fiscal deficit of the central government and the private sector investments in India. The findings suggest that in the long run, there is a significant negative relationship between Private Investments and Fiscal Deficit and variables are co-integrating. The GDP has also positive influence on private sector investments. In the short run, Private investment has slow response to the last period equilibrium error.

Both long-term and short-term relationship is evident. Fiscal deficit crowds out private investments in the long run. Only regulating interest rate to promote private sector investments is not enough. Fiscal prudence of central government is important for encouraging private sector investments. Fiscal deficit needs to be minimized by reducing unproductive expenditure. However, expenditure on infrastructure, Research & Development, should continue as they promote private sector investments.

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