Working Paper 367

# Relationship Between Fiscal Deficit Composition and Economic Growth in India: A Time Series Econometric Analysis

**Anantha Ramu M R**
**K Gayithri**

ISBN 978-81-7791-223-4



*Institute for Social and Economic Change (ISEC) is engaged in interdisciplinary research in analytical and applied areas of the social sciences, encompassing diverse aspects of development. ISEC works with central, state and local governments as well as international agencies by undertaking systematic studies of resource potential, identifying factors influencing growth and examining measures for reducing poverty. The thrust areas of research include state and local economic policies, issues relating to sociological and demographic transition, environmental issues and fiscal, administrative and political decentralization and governance. It pursues fruitful contacts with other institutions and scholars devoted to social science research through collaborative research programmes, seminars, etc.*

*The Working Paper Series provides an opportunity for ISEC faculty, visiting fellows and PhD scholars to discuss their ideas and research work before publication and to get feedback from their peer group. Papers selected for publication in the series present empirical analyses and generally deal with wider issues of public policy at a sectoral, regional or national level. These working papers undergo review but typically do not present final research results, and constitute works in progress.*

# RELATIONSHIP BETWEEN FISCAL DEFICIT COMPOSITION AND ECONOMIC GROWTH IN INDIA: A TIME SERIES ECONOMETRIC ANALYSIS

**Anantha Ramu M R and K Gayithri**∗

## Abstract

*High and persistent fiscal deficit is one of the major macroeconomic problems in India since the mid-1980s. Fiscal consolidation is in the forefront of policy discussion in India not only at present but since the early 1990s. But the actual administrative measure to control it constitutionally by enacting an Act took place in 2003 and the Fiscal Responsibility & Budget Management (FRBM) Act came into force in April 2004. The major reason behind controlling fiscal deficit is its adverse effect on the macro economy, particularly output growth. Monetary policy makers in India (RBI) argue that high deficit will adversely affect growth and hence requires control. But fiscal policy makers (Ministry of Finance) argue that government spending will promote growth. Hence, there exists a puzzle about how fiscal deficit is affecting GDP in India. This paper tries to answer the puzzle by taking up a long-term time series analysis starting from 1980-81 to 2012-13. It also carries a detailed analysis by including the composition of fiscal deficit and its impact on GDP. By adopting a Vector Error Correction method, this paper proves that fiscal deficit is adversely affecting growth and also argues that if fiscal deficit money is spent on capital formation, it promotes growth, supporting the 'Golden Rule' of public finance.*

**Key Words:** Fiscal Deficit, Economic Growth, VEC

**JEL Classification:** E62, O40, C32

The relationship between fiscal deficit and economic growth is one of the highly debated issues in economic literature. But there is still no clear conclusion on this relationship. Theoretically, there are three different views in this regard. As per neo-classical theory, fiscal deficit will adversely affect growth whereas Keynesian economists argue that deficit spending is required in order to use the existing unutilised services. Standing apart from these two theories, Ricardian equivalence argues that there is no such relationship between deficit and growth. Even the existing empirical literature has different conclusions on this.

High fiscal deficit is a major macroeconomic problem facing India. Fiscal consolidation is in the forefront of policy discussion in India not only now but since the early 1990s. But the actual administrative measure to control it constitutionally by enacting an Act took place in 2003 and the Fiscal Responsibility & Budget Management (FRBM) Act came into force in April 2004. It has been always argued that higher deficits would adversely affect the macro economy and hence should be kept under control. But the literature on fiscal deficit's relationship with macroeconomic variables like inflation, interest rate, economic growth rate and current account deficit provide mixed evidence. Many internal studies by Reserve Bank of India (RBI) argue that fiscal deficit is the major factor behind higher and persistent inflation and that it also adversely affects economic growth (RBI, 2012, Kundrapam *et al*, 2010). But the North Block (Central Government) in India counters that; higher government spending will boost economic growth. However, there has been no long-term analysis to assess this relationship

∗ PhD Scholar and Professor of Economics at CESP, Institute for Social & Economic Change (ISEC), Bangalore – 560072, Karnataka, India. E-mail: anantharamu@isec.ac.in (or) gayithri@isec.ac.in.

pertaining to Indian economy. Hence, this paper tries to analyse the relationship between fiscal deficit and GDP growth in India on a long-term basis over the last 33 years, starting from 1980-81 to 2012-13.

The economic growth of a country depends on several factors like investment, demographic structure, socio-economic condition, economic climate for investment, Government spending and so on. Government plays an important role in the growth of a nation. The intention of this paper is NOT to find the determinants of economic growth rate, but to assess the role of Government deficit spending on economic growth.

The structure of this paper is as follows. The first section provides a theoretical background to the paper. In the second section a brief review of available literature is provided. Data and methodological part is elaborated in the third section. The results obtained will be discussed in the fourth section and the last section concludes with some policy suggestions.

## Section-1

## Theoretical Background

The text-book version of national income identity clearly mentions that total output is obtained by adding four important macroeconomic indicators namely, private consumption, government consumption, investment and net exports. The national identity is as follows:

$$Y = C + G + I + (X - M)$$

Where Y is total output (gross domestic product or national income), C is consumption expenditure, G is Government consumption, I is the investment (gross capital formation), X is exports and M is the imports. In this simple framework it is evident that a rise in 'G' should result in an increase in national income. However, it depends on how well the government money has been spent. Government's capital spending is covered in 'I'. An increase in government spending keeping taxes constant will positively affect employment opportunities and income, and it finally results in output rise.

Different schools of economic thought have varied discussions on the relationship between fiscal deficit and growth rate of GDP. The neo-classical theory argues that Government dis-savings caused by deficit in budget will have a detrimental effect on growth rate. Any increase in Government borrowing raises the interest rate, which adversely affects private investment, which in turn affects the growth rate. Higher external borrowing to fill the investment gap adversely affects the exchange rate and trade account, which again affects growth rate unfavourably.

In the Keynesian perspective, Government expenditure will have a multiplier effect on output and employment. Increased expenditure will augment aggregate demand in the economy, which improves the profitability of private investment and leads to higher investment. Overall, higher Government expenditure will have a positive effect on the growth rate of the economy. According to J.M. Keynes, deficit spending is necessary during times of depression. And in developing countries too, many policy makers have argued that deficit financing would be an effective tool to promote economic growth given the large amount of underutilised resources (Nelson & Singh, 1994).

Criticisms have cropped up against Keynesian theory with the emergence of monetarists as mainstream economists. Monetarists argue that fiscal policy is impotent. Fiscal policy unaccompanied by

an accommodating monetary policy is powerless to influence real output (Blinder & Solow, 1974:62). The monetarists argue that deficit spending carries with it either creation of new high powered money, and they call it as monetary policy and new bond floatation (in this case they deny that government spending will be expansionary). Monetarists have built a single equation model to study the behaviour of the economy. The model is as follows:

$$Y_t = f(G_t, T_t, M_t, Z_t)$$

Where Y is GDP or output, G summarises government expenditure actions, T includes tax variables, M combines monetary policy actions and Z includes all other factors which influence total spending. Blinder and Solow (1974) criticised the monetarist's single equation model as it was wrongly specified and the serious reason was that they treated monetary and fiscal policy as exogenous. Term exogenous means that it is determined outside the economic system and in statistical terms, it is independent of error terms. Later on, a framework consisting of Keynesian theory and monetarists' theory was developed by J R Hicks and named as IS-LM curve framework. The ultimate effect of shifts in IS-LM curve will be on aggregate demand in the economy. When the fiscal policy is expansionary i.e., when expenditure increases or tax decreases, the IS curve shifts rightwards. An increase in real government expenditure leads to a rise in aggregate demand and real output. However the government expenditure's effect depends on how the amount is financed. The effect and its magnitude will be different when it is financed by printing money and financed through bonds. The IS-LM framework treats fiscal and monetary policy as exogenous but determines the endogenous variables like interest rate and output (Mankiw, 2008; 299).

Diverging from the above mentioned theories completely, Ricardo argued that fiscal deficits are viewed as neutral in terms of their impact on growth. In Ricardian perspective, the financing of budget by deficit is done only to postpone taxes. The deficit in any current period is exactly equal to the present value of future taxation that is required to pay off the increment to debt resulting from the deficit. In other words, government spending must be paid for, now or later, and the present value of spending must be equal to the present value of tax and non-tax revenues. The concept of fiscal deficit is irrelevant in the Ricardian perspective.

Basically, the three theories have different views on the relationship between deficit, government expenditure and growth.

## Section-2

## Literature Review

The literature review part is divided into two major heads: first, determinants of economic growth and second, fiscal deficit & economic growth. In the first head the review has covered major literature analysing the determinants of economic growth. The second head consists of literature mainly concentrating on fiscal deficit's relationship with GDP. The review covers both international and national literature on the mentioned heads.

*Determinants of Economic Growth:*

The theoretical and empirical literature on factors determining growth was well captured in a paper by Stern (1991). The author found that capital accumulation, human capital, research, development & innovation, management & organisation and infrastructure are the major determinants of growth and argued that there is a high potential for government action in the growth process.

A classic paper by Barro & Sala-i-Martin (1995) was one of the highly quoted papers in growth empirics. By adopting a cross section-analysis on 48 US states they found that male schooling, life expectancy, human capital, education spending, investment ratio and terms of trade have significant positive relation with growth, and other explanatory variables like government consumption, political instability, and black market premium have negative relation. Robert J. Barro (1996) in a panel regression analysis on 100 countries also proved that human capital, rule of law, terms of trade and investment ratio play a significant role in promoting growth whereas inflation & government consumption excluding defence and education spending showed a negative relation with growth. Challenging the endogenous growth model and using augmented Solow type growth model, Mankiw *et al* (1992) argued that both physical and human capital variables have significant relation with growth. In general, they found that the Solow model is consistent with international evidence if one acknowledges the importance of human as well as physical capital.

In a disaggregated analysis on Chinese economy using cross sectional data, Chen and Feng Yi (2000) investigate the determinants of provincial growth variations in China. Variables like higher education enrolment ratio, industrialisation, and investment have showed positive relation whereas other variables like birth rate, inflation and state-owned enterprises moved negatively with growth rate.

Basically, these major literatures depicted that investment, trade, and human capital have a significant positive effect on the economy and inflation, government consumption expenditure etc. have a deterring effect on growth.

*Fiscal Deficit & Growth:*

Fiscal deficit is said to be one of the important variables to have an influence on output growth. Martin R & Fardmanesh (1990) tried to assess the impact of different fiscal variables on economic growth for a cross-section of 76 developed & developing countries for the time period 1972-81. Along with fiscal deficit they included government expenditure, revenue, non-tax revenue, gross capital formation and population growth. Using cross sectional linear regression, the authors found that deficit and tax revenue have a negative relationship with growth whereas total expenditure has a positive relation. However, the sign of total expenditure reverses when they included the deficit variable along with the total expenditure. By dividing the countries into low, middle and high income categories they found that the negative relation between deficit and growth holds only for the middle income countries but not for the other two categories. The result seems to be contradictory here because low and middle income countries require more government spending in order to utilise the existing unutilised resources.

After the emergence of Keynesian economics, the concept of deficit financing has been found to be significant. But other mainstream theories, like the neo-classical theory, argued that fiscal deficit will have an adverse impact on the economy. In order to capture the relation empirically, Nelson &

Singh (1994) analysed the deficit-growth connection for 70 developing countries using cross section regression. The authors framed the model based on major theories in growth and development literature and tested the expanding public-sector economic-decline hypothesis. They found that the deficit coefficient, even though negative, was insignificant indicating no relationship with growth rate, and even public investment was not of much significance. Revenue and inflation showed a negative relation whereas other variables were significant and had a positive relation with growth. But doubt arises when the capital investment part of government expenditure adversely affects growth and this requires proper investigation. In a panel regression analysis, Adam & Bevan (2005) examined the relationship between fiscal deficit and growth for 45 countries for the period from 1970 to 1999. The analysis consisted of government budget variables and other control variables. They found an interesting result. Values of deficit less than or equal to 1.5% of GDP were found to be growth enhancing whereas deficits above that threshold level were found to be growth deteriorating. Seigniorage financing of deficit followed the same result. Debt financing of deficit was found to be having a negative effect on per capita growth irrespective of the threshold level. By replacing expenditure for deficit they found that productive expenditure had significant positive relation with growth and residual expenditure had negative relation.

In a time series analysis on US economy, Taylor *et al* (2012) analyses the relation between fiscal deficit, debt and growth. Using the VEC framework and quarterly data starting from 1961 to 2011, the authors argued that primary fiscal deficit has a significant positive effect on growth. They found that higher debt affects growth adversely but causality result proved that a higher debt-GDP ratio is the consequence but not the cause of low growth. The total expenditure had a positive relation while tax revenue moved in a reverse direction with GDP. The authors strongly argue that higher fiscal deficit stimulates the economy during recession. Another study by Ferreira & Hamilton (2008) on Brazil's economy proved that if the deficit money is spent on infrastructure building it will have a positive effect on growth in the long run.

Pertaining to Indian economy, Kundrakpam (2003) has analysed the dynamic interaction between the public sector expenditure and national income for the period 1960-61 to 1996-97. The author tested two major propositions on the relation between economic growth & government expenditure, namely Wagner's Law of increasing state activity and the Keynesian proposition. The former states that the higher the output, the higher will be the spending while the latter states it is the other way round. The long run coefficients indicated that public sector expenditure, total or the consumption component has a long-run positive impact on national income. A rise in the share of public sector expenditure in national income leads to a decline in both the national income and its per capita. Irrespective of the specification, investment in the long-run has positively impacted income growth. There was no evidence of Wagner's Law in the Indian context. Rather, the relationship between public sector expenditure and national income in India works in the Keynesian fashion. Moving on to the prime issue of fiscal deficit, which is the major concern even for many state governments in India, a study on Maharashtra state by Karnik (2002) proved that fiscal deficit and revenue deficit variables both had a negative effect on the growth of state domestic product.

The empirical evidence on the relationship between fiscal deficit and GDP is mixed. There is no conclusive proof on how fiscal deficit affects GDP growth. There is also no detailed long term analysis to study the relation between fiscal deficit and growth. This paper makes an additional contribution to the existing literature by modelling the fiscal deficit composition and its impact on GDP. Methodologically also the present paper adopts advanced econometric tools like vector error correction methods, which include a system of equations unlike a normal single equation approach. This paper tries to solve the puzzle in the Indian context at a macro level using long-term data.

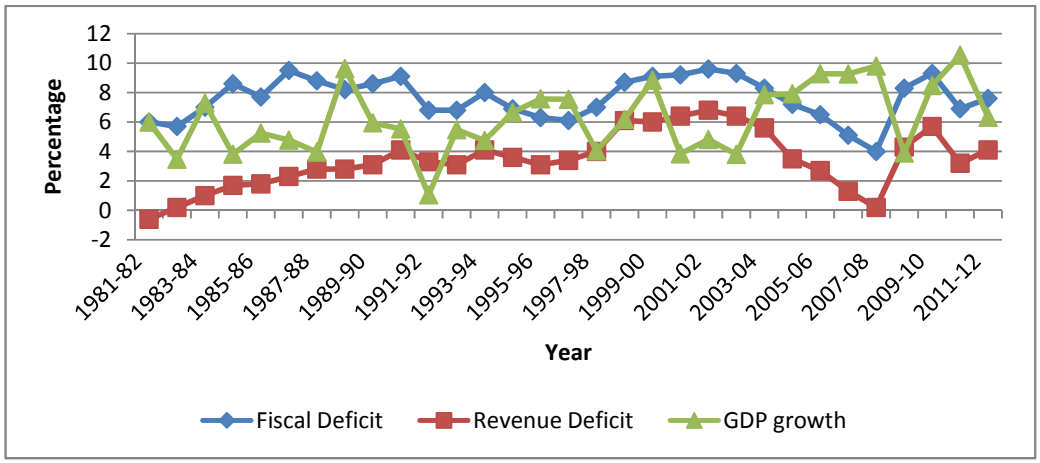
## Section- 3

## Data, Variables and Methodology

Before moving on to the data and analysis part, it is important to check how the deficit indicators and GDP growth perform over the years (see Figure-1). The deficit indicators are the combined central and state government fiscal and revenue deficits as a per cent of GDP. The growth variable is the growth rate of real GDP at market prices.

Fiscal deficit has been at a high level since the 1980s and reached a peak in the early 2000. Revenue deficit, which was comparatively less in the early 1980s, started rising in the late 1980s and reached a peak level in early 2000. GDP growth has been fluctuating and had a drastic fall in early 1990s. However, it revived later on. The Government of India enacted the Fiscal Responsibility and Budget Management (FRBM) Act in 2003. After the enactment, deficit indicators started behaving well and reached the lowest level in 2008. The GDP growth almost reached the double digit in that year. However, the global financial crisis in late 2008 and the general election in 2009 made the situation worse again. Presently, the Indian government is trying to bring the deficit level to a manageable level by 2017-18 and putting in efforts to revive growth. Except for the years in early 1980s & 1990s and also between 1997-98 and 2000, an inverse relation can be seen between these two variables. The movement of deficit and growth is almost in line with mainstream neo-classical argument.

**Figure 1: Trends in Deficit Indicators & GDP (in %)**




**Source:** RBI Database on Indian Economy, 2015

Considering one variable in growth terms and the other variables as a percent of GDP may not reveal the true picture of the movement among the variables. In order to capture the movement properly, the growth rate of all the three variables, namely GDP, fiscal deficit and revenue deficit is considered. The growth of the three variables is provided in Table 1. The movement is captured under five different phases, and these five different phases are selected based on major policy reforms that took place in India particularly from the fiscal policy side. Phase-I is the pre-economic reform period and phase-II is the post economic reform period. Phase-III is the pre FRBM period when the fiscal and revenue deficit reached its peak level. The growth rate of GDP was around 5% to 6% in the first three phases on an average. However, year wise GDP growth was highly fluctuating in these years. As observed by Panagariya A (2008), there was steady GDP growth in the mid-1980s with several reforms in export and import policies, telecommunication sectors and foreign equities holdings. The growth rate of GDP crossed 8% in 1988-89 but started deteriorating in the next few years due to political instability. It deteriorated further and reached the lowest point of 1.08% in 1991-92. This was one of the important reasons behind the 1991 economic reforms. After the 1991 reforms there was an upward trend in GDP growth rates until 1996-97. The fourth phase is the FRBM era and in that period fiscal variables were well under control. The last phase covers the period since the 2008 global financial crisis. However, even from Table 1 the trend is not much clear except for the last two phases where GDP growth and deficit growth move inversely. Hence, in order to capture the behaviour of GDP and fiscal variables over 33 years since 1980-81 an attempt will be made here using suitable econometric techniques.

**Table 1: Growth Rate of GDP, Fiscal Deficit and Revenue Deficit (in %)**

| Phases | Time Period | GDP | FD | RD |
|---|---|---|---|---|
| I | 1980-81 to 1990-91 | 5.57 | 9.14 | 22.17 |
| II | 1991-92 to 1996-97 | 5.51 | -0.16 | 4.31 |
| III | 1997-98 to 2003-04 | 5.62 | 10.73 | 15 |
| IV | 2004-05 to 2007-08 | 9.06 | -8.91 | -45.03 |
| V | After 2008 | 7.31 | 36.24 | 563.38 |

**Source:** RBI Database on Indian Economy, 2015

The purpose of this paper is to find how fiscal deficit influences economic growth in India. The time period of the study is from 1980-81 to 2012-13. The analysis starts from 1980-81 mainly because the data on combined fiscal deficit level is available only from that period. The data includes only the actual values and not any revised or budget estimates and hence 2012-13 is taken as the end point of the study period, for which actual values are available for all the variables to be included in the model. As the analysis is limited only to Indian economy at an aggregate level, time series econometric techniques will be used for the empirical examination considering the annual data series. The variables for the analysis have been chosen based on theoretical and empirical background. Theoretically there is an argument that neo-classical theory did not leave much role for fiscal policy but the recent endogenous growth framework had given a fundamental role for the government in affecting the long-term growth performance of any country (Tanzi & Zee, 1997). This paper adopts the analytical

framework provided by Khundrakpam (2003) with a few modifications in variable selection. For the empirical analysis this paper adopts the Vector Error Correction model under the time series technique. Variables included in the model are as follows:

1. Real GDP at market price (GDP): The main intention of this paper is to assess the impact of fiscal deficit on economic growth rate. However, there will be little variation when we consider growth rate per se under the annual data series. Hence in the analysis, real GDP at market prices is considered so that the variation can be captured thoroughly.

*Fiscal variables:*

2. Tax revenue (TaxRev): Tax revenue receipts of central and state governments. It is expected that higher tax retards growth and hence its sign condition may be negative.
3. Gross fiscal deficit (GFD): Combined fiscal deficit of Centre and state governments. Fiscal deficit is the difference between total expenditure and revenue receipts and non-debt type capital receipts.
4. Revenue deficit (RD): Combined revenue deficit of Centre and state governments. Revenue deficit is the difference between revenue receipts and revenue expenditure.
5. Effective Fiscal Deficit (EFD): It is the new term coined for this paper. It is the amount that remained after netting out revenue deficit part from the fiscal deficit. This is the amount actually used for capital investment by the government[1].

*Other Variables:*

6. Private Investment (Inv): Gross capital formation by private sector, which includes private corporate and household sectors. As per neo-classical theory, higher private investment promotes growth and its expected sign condition is positive.
7. Exchange Rate (Exch): It is the nominal exchange rate between Indian rupee and US dollar. This variable is included in order to capture the external sector's effect on growth. Theoretically it is argued that a higher exchange rate results in lowering the value of the domestic currency against a foreign currency. It is expected that the higher exchange rate will adversely affect net exports and ultimately affect the GDP. A negative sign is expected.

The econometric analysis will be done using two separate models. In the first model, the relationship between fiscal deficit and GDP will be measured. And in the second model, fiscal deficit will be replaced by effective fiscal deficit and revenue deficit. The variables included in the first and second models are as follows:

Model-1: GDP= f (Gross Fiscal Deficit, Tax Revenue, Private Investment, Exchange rate)

Model-2: GDP= f (Effective Fiscal Deficit, Revenue Deficit, Tax Revenue, Private Investment, Exchange rate)

Three time dummies, namely dummy 1991, dummy 2004 and dummy 2009, has been used in the analysis exogenously to control for any structural effect if it exists[2]. The year 1991 is a landmark in

[1] However a part of EFD is used for repayment of loans and will not result in capital formation.

[2] Properly specified dummies do not affect asymptotic null distributions (Luktepohl, 2004:116).

Indian economic history as the major economic reforms took place in that year. In the field of public finance, the year 2004 is a turnaround year. Government of India enacted the FRBM Act in 2003 and in order to capture its effect, year 2004 dummy is used in the analysis. The year 2009 dummy is used to capture the effect of recent global financial crisis. However, these dummies will be included in the model if they are found to be significant.

A summary descriptive statistics of the variables used in the model is provided in Table 2.

**Table 2: Descriptive Statistics**

(in Rupees Billion)

| Variables | Mean | Median | Maximum | Minimum | Std. Dev. | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| GDP | 24803.3 | 20497.9 | 58998.5 | 8663.4 | 14751.5 | 0.9 | 2.7 |
| GFD | 1876.3 | 1359.7 | 4568.4 | 537.2 | 1157.3 | 1.0 | 3.1 |
| FD-RD | 955.9 | 732.0 | 2216.8 | 516.9 | 508.1 | 1.3 | 3.2 |
| RD | 920.4 | 630.1 | 2736.6 | -51.6 | 774.4 | 0.7 | 2.3 |
| TAXREV | 3768.2 | 2849.6 | 9915.8 | 1144.2 | 2504.9 | 1.1 | 2.9 |
| PRIINV | 5191.81 | 3332.76 | 15999.42 | 768.55 | 4815.32 | 1.1 | 2.8 |
| EXCH* | 31.78 | 35.49 | 54.40 | 7.90 | 15.31 | -0.33 | 1.51 |

**Data Source:** RBI DBIE, 2015 and CSO.

* exchange rate is the rate of exchange between Indian rupee and US dollar (absolute number in rupees against US dollar, not in rupees billion)

**Table 3: ADF Unit Root Test**

| Variables | Level | First Difference |
|---|---|---|
| ln(GDP) | 1.812 | -4.71* |
| ln(GFD) | -0.803 | -5.66* |
| ln(FD-RD) | 0.372 | -7.17* |
| RD | -1.780 | -3.92* |
| ln(Tax Revenue) | 0.976 | -4.52* |
| ln(Private Inv) | 0.449 | -8.85* |
| Exch | -0.60 | -4.46* |

* significant at 1% level ** Significant at 5% level *** Significant at 10% level

The time series analysis expects the data to be stationary in nature and hence it is important to check whether the data considered has unit root or not. The ADF unit root test is performed for checking the same. The ADF unit root test (see Table 3) indicates that all the variables contain unit root and becomes stationary in the first difference. Hence the variables considered in the model are i(1) in nature[3].

As the data indicates all the variables are i(1) in nature, it is important to check whether there exists a long run cointegration relation among the non-stationary data or not. The conventional method

[3] The result is same even with Phillips-Perron Unit root test

of testing cointegration was proposed by Engle & Granger (1987). But this method has several limitations as it does not indicate the number of cointegrating vectors when there are more than two variables. Phillips and Hansen (1990) developed Fully Modified Ordinary Least Square (FM-OLS) approach to cointegration by including correction factors for endogeneity and serial correlation problems, which existed in the traditional method. As these are single equation methods, the results depend on what variable is used for normalisation of the cointegration relationship (Maddala & Kim, 1998:211). In order to overcome these problems, the system method of cointegration will be used in the present analysis as it enable us to see how many cointegrating vectors are present among the variables and also, the problem of normalisation will not appear. The bi-directional causality will be taken care of and all the variables are treated as endogenous in the system method. Hence, in order to check the existence of cointegration, Johansen and Juselius (1990) method has been used here, which overcomes the aforementioned problems like normalisation and others. Johansen cointegration method has two tests to check cointegration; they are $\lambda_{trace}$ & $\lambda_{max}$. The $\lambda_{trace}$ statistic tests the null hypothesis that the number of distinct cointegrating vectors is less than or equal to r against a general alternative of k cointegration relation, where k is the number of endogenous variables in the system. The $\lambda_{max}$ statistic tests the null that the number of cointegrating vector is r against the alternative r+1 cointegrating vectors (Enders 2004, 352). The results obtained using Johansen's method are provided in Table 4.

**Table 4: Johansen Cointegration Test Results**

| **Trend Assumption: Linear Deterministic trend** | | | | | | |
|---|---|---|---|---|---|---|
| **Models** | **Lag Order** | **Hypothesised No of C-Equations** | **Trace Stats** | **p-value** | **Max Eigenvalue** | **p-value** |
| Model-1 | 1, 2 | None | 118.22 | 0.0001* | 61.08 | 0.000* |
| | | At most 1 | 57.14 | 0.16 | 27.51 | 0.16 |
| | | At most 2 | 29.62 | 0.52 | 14.06 | 0.71 |
| | | | | | | |
| Model-2 | 1 | None | 152.68 | 0.000* | 67.15 | 0.00* |
| | | At most 1 | 85.53 | 0.08 | 38.30 | 0.06 |
| | | At most 2 | 47.22 | 0.54 | 22.18 | 0.47 |

*denotes rejection of hypothesis at 5% level

The result indicates that there exists a cointegration relationship among the variables in all the models selected. Both $\lambda_{trace}$ and $\lambda_{max}$ tests confirm the existence of cointegration relation. Both the models have one cointegrating relation. After confirming the existence of cointegration relation we can proceed with the Vector Error Correction (VEC) model for estimating long run and short run relationship among the variables. The estimation procedure for the first model is depicted here and for the second model, the procedure remains the same.

The long run equation of the model-1 is in the following form:

$$\ln GDP_t = \beta_{10} + \beta_{11} \ln GFD_t + \beta_{12} \ln TaxRev_t + \beta_{13} \ln PriInv_t + \beta_{14} Exch + e_t \quad \ldots\ldots. (1)$$

GDP is normalised to be one in the long-term equation. If a variable is part of the cointegration equation with non-zero coefficient, it may thus be normalised to one Lutkepohl (2004:155). The next step is to test whether the obtained error is stationary at levels or not. If it is stationary then we can conclude that the variables are cointegrated. However, it has been already proved here with the help of Johansen's method that the data is cointegrated.

The next step is to estimate the error correction model and the model looks as follows:

$$\Delta \ln GDP_t = \alpha_{10} + \alpha_{11}[\ln GDP_{t-1} - b_{11} \ln GFD_{t-1} - b_{12} \ln TaxRev_{t-1} - b_{13} \ln PriInv_{t-1} - b_{14} Exch_{t-1}] + \gamma_{11} \Delta \ln GDP_{t-i} + \gamma_{12} \Delta \ln GFD_{t-i} + \gamma_{13} \Delta \ln TaxRev_{t-i} + \gamma_{14} \Delta \ln PriInv_{t-i} + \gamma_{15} \Delta Exch_{t-i} + \varepsilon_{1t} \quad \ldots\ldots. (2)$$

$$\Delta \ln GFD_t = \alpha_{20} + \alpha_{21}[\ln GDP_{t-1} - b_{21} \ln GFD_{t-1} - b_{22} \ln TaxRev_{t-1} - b_{23} \ln PriInv_{t-1} - b_{24} Exch_{t-1}] + \gamma_{21} \Delta \ln GDP_{t-i} + \gamma_{22} \Delta \ln GFD_{t-i} + \gamma_{23} \Delta \ln TaxRev_{t-i} + \gamma_{24} \Delta \ln PriInv_{t-i} + \gamma_{25} \Delta Exch_{t-i} + \varepsilon_{2t} \quad \ldots\ldots. (3)$$

$$\Delta \ln TaxRev_t = \alpha_{30} + \alpha_{31}[\ln GDP_{t-1} - b_{31} \ln GFD_{t-1} - b_{32} \ln TaxRev_{t-1} - b_{33} \ln PriInv_{t-1} - b_{34} Exch_{t-1}] + \gamma_{31} \Delta \ln GDP_{t-i} + \gamma_{32} \Delta \ln GFD_{t-i} + \gamma_{33} \Delta \ln TaxRev_{t-i} + \gamma_{34} \Delta \ln PriInv_{t-i} + \gamma_{35} \Delta Exch_{t-i} + \varepsilon_{3t} \quad \ldots\ldots. (4)$$

$$\Delta PriInv_t = \alpha_{40} + \alpha_{41}[\ln GDP_{t-1} - b_{41} \ln GFD_{t-1} - b_{42} \ln TaxRev_{t-1} - b_{43} \ln PriInv_{t-1} - b_{44} Exch_{t-1}] + \gamma_{41} \Delta \ln GDP_{t-i} + \gamma_{42} \Delta \ln GFD_{t-i} + \gamma_{43} \Delta \ln TaxRev_{t-i} + \gamma_{44} \Delta \ln PriInv_{t-i} + \gamma_{45} \Delta Exch_{t-i} + \varepsilon_{4t} \quad \ldots\ldots. (5)$$

$$\Delta Exch_t = \alpha_{50} + \alpha_{51}[\ln GDP_{t-1} - b_{51} \ln GFD_{t-1} - b_{52} \ln TaxRev_{t-1} - b_{53} \ln PriInv_{t-1} - b_{54} Exch_{t-1}] + \gamma_{51} \Delta \ln GDP_{t-i} + \gamma_{52} \Delta \ln GFD_{t-i} + \gamma_{53} \Delta \ln TaxRev_{t-i} + \gamma_{54} \Delta \ln PriInv_{t-i} + \gamma_{55} \Delta Exch_{t-i} + \varepsilon_{5\,t} \quad \ldots\ldots. (6)$$

The coefficients $\alpha_{11}$ $\alpha_{21}$ $\alpha_{31}$ $\alpha_{41}$ $\alpha_{51}$ indicates the speed of adjustment to equilibrium and its corresponding value in the bracket is the error correction term. These coefficients must be significantly different from zero if the variables are cointegrated and estimates of these coefficients must not be too large. The $\gamma$ coefficients indicate the short-term relation. With regard to lag length selection, two lags have been included in the first model and one lag in the second model. As there are six variables in the second model, including two lags would lead to loss of degrees of freedom and hence one lag is included. Logically also, as the data is annual, we expect that the impact will be well captured with a lag of one year or two.

## Section-4

## Result Discussion

The long-term and short-term estimates of model-1 are provided in Table 5. The first part of the table consists of long-term estimates and the second part has short term estimates. Before discussing the results obtained, it is important to check whether the model has any problem by using the diagnostic tests of the regression. R-squared value is high. The LM test result indicates that there is no serial

correlation among the error terms; it is homoscedastic and normal. The stability tests (please see appendix 2.1) indicates that the model is stable and the results are reliable.

The long-term estimates suggest that fiscal deficit has a significant negative relation with GDP. The coefficient value signifies that a 1% increase in fiscal deficit reduces GDP by 0.27%. This result supports the neoclassical argument. Private investment impact is significant and positive. 1% increase in private investment leads to 0.42% increase in GDP. It is expected that higher taxes will adversely affect GDP through the private investment channel. Even though the sign condition of tax revenue is negative it is insignificant here. Exchange rate impact is negative but it is insignificant. A higher exchange rate will have an adverse effect on GDP in the long term. However, in this model it is not showing any relation. One could include a linear trend term in the process in a fully general form to be on the safe side (Lutkepohl, 2004:120). However it may result in substantial power loss if the trend is insignificant. In the present analysis, the trend value is significant in both the equations.

**Table 5: Results of Model-1**

**Long-Term Estimates***

***Cointegration Eqn-1:***

LnGDP = -0.276 lnGFD(-1) + 0.42 lnPri Inv(-1) – 0.16 lnTaxRev(-1) - 0.28 Exch +
[-6.89] [3.63] [-0.51] [0.44]
0.13 Trend + 16.52 C
[-4.45]

**Short-Term Estimates***

ΔlnGDP = -0.20 ECM – 0.14 ΔlnGDP(-1) + 0.07ΔlnGDP(-2) + 0.10 ΔlnPriInv(-1) + 0.07 ΔlnPri Inv +
[-4.92] [-0.73] [0.40] [3.34] [2.50]
0.002ΔlnGFD(-1) + 0.03 ΔlnGFD(-2) - 0.12 ΔlnTaxRev(-1) - 0.16ΔlnTaxRev(-2) +
[0.12] [2.19] [-1.40] [-1.96]
0.3ΔExch(-1) - 0.09 ΔExch + 0.08 C – 0.05D91 + 0.04 D04
[2.14] [-0.59] [5.98] [-4.28] [4.88]

**Diagnostic Check Results**

R-Squared: 0.80 R-Bar Squared: 0.64 Heteroscedasticity Test: Chi Sq383.31 (p-value0.19)

| **LM Serial correlation Test:** | | | **Normality Test:** | | |
|---|---|---|---|---|---|
| **Lags** | **LM Stats** | **P-Value** | | **Chi Sq** | **P-Value** |
| Lag 1 | 31.21 | 0.18 | Skewness | 8.42 | 0.13 |
| Lag 2 | 25.52 | 0.43 | Kurtosis | 3.75 | 0.58 |
| Lag 3 | 31.59 | 0.17 | Jarque-Bera | 12.18 | 0.27 |

* t-values are provided in the brackets [ ]

In the short term, the error correction term is negative and significant. It confirms the cointegration among the variables and proves that nearly 20% of the disequilibrium is corrected in a year. Private investment has a significant and positive relation with GDP in both the lags. Fiscal deficit's

relation with GDP in the short term is insignificant. However in the second lag it turns out to be positive. Tax revenue has a negative relation with GDP in the short term. The exchange rate impact in the first lag has a positive relation with GDP. It implies that any increase in exchange rate (depreciation of rupee) will result in more exports and less imports as Indian goods become cheaper. But in the long-term it has no relation as shown already. The dummy variables to account for seasonality or structural shifts may be considered, and properly specified seasonal dummies do not affect the asymptotic null distributions Lutkepohl (2004:116). The two exogenous time dummies, namely dummy 1991 and dummy 2004, were used in the analysis and both were found to be significant.

The result obtained here is in line with the result obtained by Martin R & Fardmanesh (1990) in their cross section analysis, but is the opposite of certain studies like Nelson & Singh (1994), where they found insignificant relation between fiscal deficit and growth, and a study by Taylor *et al* (2012), where the authors found the deficit having significant positive relation with growth for the US economy. The result here confirms that fiscal deficit has a significant negative relation with GDP in India.

The result clearly indicated that fiscal deficit is adversely affecting the economy. In the Keynesian framework, deficit financing is required in order to use the unutilised resources in a perfect way, mainly in less developed & developing countries. It was always suggested that the fiscal deficit amount should be spent on capital formation purpose so that it will have a multiplier effect on growth in the long term. As per the 'Golden Rule' of public finance, whatever may be the amount of fiscal deficit, it should be spent for capital formation purpose but not for current spending. But in the Indian scenario, the revenue deficit covers a major portion of the fiscal deficit and the actual amount left for capital investment is less. A scenario of effective fiscal deficit is provided in *appendix-1*. Except for the year 2008, in many years revenue deficit covers a major part of fiscal deficit. In recent years, it constitutes nearly 50% of the fiscal deficit. If we consider central government accounts alone, revenue deficit covers nearly 74% in the year 2012-13. At the state government level, except for a few states like West Bengal and others, the remaining states are performing well and have a revenue surplus in their account. But still the combined account is in a critical condition. In order to analyse how revenue deficit and the fiscal deficit minus the revenue deficit behave, model-1 has been reframed just by replacing revenue deficit and effective fiscal deficit in the place of gross fiscal deficit. The result of this model is presented in Table 6. The diagnostic tests of the result *(please see appendix 2.2)* confirm that there is no auto correlation, no heteroscedasticity, and residuals are normal in distribution. The stability test of the model confirms that the model is stable.

**Table 6: Results of Model-2**

**Long-Term Estimates***

***Cointegration Eqn-1:***

LnGDP =0.77 lnEFD(-1) – 0.02 RD(-1) + 0.08lnPriinv(-1) – 0.36 lnTaxRev(-1) – 0.29 Exch +

[8.05] [-7.04] [0.65 ] [-2.84] [-5.76]

0.32 Trend – 29.5 C

[12.91]

**Short-Term Estimates***

ΔlnGDP = -0.17 ECM + 0.08 ΔlnGDP(-1) + 0.01 ΔlnPriInv(-1) - 0.10 ΔlnEFD(-1) + 0.85ΔRD(-1) +

[-3.99] [0.34] [0.45] [-3.03] [0.70]

0.05 ΔExch(-1) + 0.25 ΔlnTaxRev(-1) + 0.04 C - 0.01D91 + 0.01 D09

[2.09] [2.02] [3.09] [-1.70] [1.30]

**Diagnostic Check Results**

R-Squared: 0.50 R-Bar Squared: 0.29 Heteroscedasticity Test: Chi Sq352.16 (p-value0.26)

| **LM Serial correlation Test:** | | | **Normality Test:** | | |
|---|---|---|---|---|---|
| **Lags** | **LM Stats** | **P-Value** | | **Chi Sq** | **P-Value** |
| Lag 1 | 39.33 | 0.32 | Skewness | 2.82 | 0.83 |
| Lag 2 | 39.35 | 0.32 | Kurtosis | 2.80 | 0.82 |
| Lag 3 | 43.64 | 0.17 | Jarque-Bera | 5.62 | 0.93 |

* t-values are provided in the brackets [ ]

The long-term result indicates that EFD (fiscal deficit minus revenue deficit), the amount actually used for capital formation (however it includes the loan repayment part which will not result in capital formation), has a significant positive relation with GDP. A 1% change in FD-RD positively changes the GDP by 0.77%. The magnitude emphasises the importance of capital formation by the government. The revenue deficit has a significant negative relation with GDP. A 1% increase in revenue deficit reduces GDP by 0.02%. This result supports the 'Golden Rule' that if the deficit amount is used for capital expenditure purposes it significantly affects growth. Both tax revenue and exchange rate turn out be significant and are moving in the expected direction. Tax revenue has significant negative relation and exchange rate too shows significant negative relation as expected. A 1% increase in tax revenue reduces GDP by 0.36%. Higher taxes adversely affect investment and growth ultimately. Similarly, an increase of 1% in the exchange rate will reduce GDP by 0.29%. This implies that in the long term, depreciation of the domestic currency will have an adverse effect on GDP. Higher exchange rates raise import prices, cost of production and in the long term real output growth declines. There may be a counter argument that higher import prices would promote trade balance and growth by hampering imports. However, in India petroleum products and fertilisers are the major imports, and India depends on imports particularly for petroleum products as domestic production is very low. Hence, any rise in import prices would adversely affect the external sector balance, price level and growth rate of the economy.

The error correction term is significantly negative and confirms that nearly 19% of disequilibrium is corrected in a year. In the short term private investment shows a positive relation with GDP but it is insignificant. The EFD turns out to be negative in the short term. This is mainly because the impact of any capital formation or capital investment can be observed only in the long term and hence we are getting a different sign. Tax revenue and exchange rate signs turn out to be positive in the short run. The effect may not fall on output suddenly, but in the long term it will have an adverse effect on growth as already shown. The two exogenous dummies used in the model are significant. The major implication of this model is its support 'Golden Rule'. By considering the effective fiscal deficit as the actual capital investment by the Government it has been proved here that government capital formation has a significant positive impact on growth.

## Section-5

## Conclusion

This paper makes an attempt to study the existing gap in Indian economic literature by first analysing the long-term relationship between fiscal deficit and GDP growth. In the next step fiscal deficit has been replaced by revenue deficit and effective fiscal deficit. Based on the nature of Indian time series data, the Vector Correction Method has been used for the analysis.

The results obtained here reveal that fiscal deficit adversely affects GDP supporting the mainstream neo-classical theory and also the RBI's view. When fiscal deficit is bifurcated into effective fiscal deficit and revenue deficit, it has been found that the former has a significant positive relation whereas the latter has a negative relation with GDP. This result argues for reducing the revenue deficit part in the fiscal deficit. The effective fiscal deficit on the one hand enhances capital formation directly and on the other hand, indirectly encourages the private sector to invest more. Government investment in infrastructure will have a crowding-in effect for private investment. The control variables used in the paper, like private investment, indicated a positive relation with GDP while the exchange rate and tax revenue, with some exception, proved to be having a negative relation with GDP as expected.

This paper clearly support the 'Golden Rule' of public finance and argues that the fiscal deficit amount should be used for capital formation purpose and not for the current consumption of the Government. This work proves and supports the view that Government deficit spending on capital formation will lead to higher level of output growth in the long term.

## References


Adam, C S and D L Bevan (2005). Fiscal Deficits and Growth in Developing Countries. *Journal of Public Economics*, 89: 571-97.

Barro, R J (1996). Determinants of Economic Growth: A Cross- Country Empirical study. *NBER Working Paper No. 5698*. NBER, Cambridge.

Barro, R J and X Sala-i-Martin (1995). *Economic Growth.* Cambridge: The MIT Press.

Blinder, A E and R M Solow (1974). Analytical Foundation for Fiscal Policy. In Blinder, A E *et al* (eds), *The Economic of Public Finance*. Washington, D.C: The Brookings Institution Publication.

Chen, B and Feng, Yi (2000). Determinants of Economic Growth in China: Private Enterprise, Education and Openness. *China Economic Review*, 11.

Enders, W (2004). *Applied Econometric Time Series.* New Delhi: Wiley India (P) Ltd.

Engle, R and Granger, C W J (1987). Cointegration and Error Correction: Representation, Estimation and Testing. *Econometrica*, 55: 252-76.

Ferreira, P C and Hamilton, V A C (2008). Growth and Fiscal Effects of Infrastructure Investment in Brazil. In *Fiscal Policy, Stabilisation and Growth- Prudence or Abstinence?*. Washington D.C: The World Bank.

Government of India (2014). Public Finance Statistics, Ministry of Finance, GoI, New Delhi.

Johansen, S and K Juselius (1990). Maximum Likelihood Estimation and Inference on Cointegration - with Application to the Demand for Money. *Oxford Bulletin of Economics and Statistics*, 52: 169-210.

Karnik, A (2002). Fiscal Policy and Growth. *Economic and Political Weekly*, 37: 829-31.

Khundrakpam, J K (2003). Public Sector Spending and Economic Growth in India. *MPRA Paper*, No-51105

Khundrakpam, J K and S Pattanaik (2010). Fiscal Stimulus and Potential Inflationary Risks - An Empirical Assessment of Fiscal Deficit and Inflation Relationship in India. *Journal of Economic Integration*, 25 (4): 703-21.

Lutkepohl, H (2004). Vector Autoregressive and Vector Error Correction Models. In Lutkepohl, H and M Kratzig (eds), *Applied Time Series Econometrics.* New York: Cambridge University Press.

Maddala, G S and Kim, In-Moo (1998). *Unit Roots, Cointegration and Structural Change*. United Kingdom: Cambridge University Press.

Mankiw, G (2004). *Macro Economics.* New York: Worth Publishers.

Mankiw, G N, D Romer and D N Weil (1992). A Contribution to Empirics of Economic Growth. *Quarterly Journal of Economics*, 107: 407-37.

Martin, R and M Fardmanesh (1990). Fiscal Variables and Growth: A Cross-Sectional Analysis. *Public Choice,* 64 (3): 239-51.

Nelson, M A and R D Singh (1994). The Deficit – Growth Connection: Some Recent Evidence from Developing Countries. *Economic Development and Cultural Change*, 43 (1): 167-91.

Panagariya, A (2008). *India the Emerging Giant*. New Delhi: Oxford University Press.

Phillips, P C B and B E Hansen (1990). Statistical Inference in Instrumental Variables Regression with I (1) Processes. *Review of Economic Studies*, 57: 99-125.

Reserve Bank of India (2012). *Fiscal and Monetary Coordination*. Report on Currency and finance 2009-2012. Mumbai: RBI.

——— (2015). RBI Database on Indian Economy. Mumbai: RBI.

Stern, N (1991). The Determinants of Growth. *The Economic Journal*, 101 (404): 122-33.

Taylor, L *et al* (2012). Fiscal Deficits, Economic Growth and Government Debt in the USA. *Cambridge Journal of Economics,* 36 (1): 189-204.

# Appendix-1:

**Share of FD-RD in Gross Fiscal Deficit**

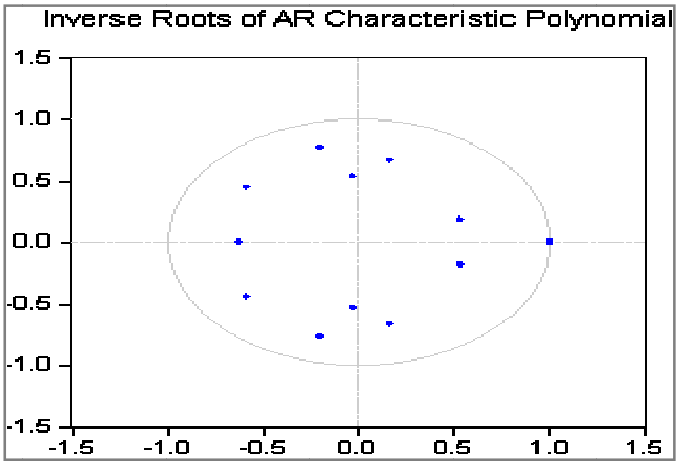
(In Rupees Billion)

| Year | Fiscal Deficit (FD) | Revenue Deficit (RD) | FD-RD | FD-RD as % of FD |
|---|---|---|---|---|
| 1990-91 | 1359.7 | 605.8 | 753.9 | 55.4 |
| 1991-92 | 1022.9 | 488.8 | 534.0 | 52.2 |
| 1992-93 | 1072.9 | 485.0 | 587.9 | 54.8 |
| 1993-94 | 1322.2 | 680.7 | 641.5 | 48.5 |
| 1994-95 | 1213.9 | 630.1 | 583.8 | 48.1 |
| 1995-96 | 1206.7 | 589.3 | 617.4 | 51.2 |
| 1996-97 | 1260.0 | 704.3 | 555.7 | 44.1 |
| 1997-98 | 1502.1 | 851.6 | 650.5 | 43.3 |
| 1998-99 | 1972.3 | 1389.2 | 583.1 | 29.6 |
| 1999-00 | 2264.2 | 1487.1 | 777.1 | 34.3 |
| 2000-01 | 2358.9 | 1638.3 | 720.6 | 30.5 |
| 2001-02 | 2587.1 | 1820.7 | 766.4 | 29.6 |
| 2002-03 | 2586.3 | 1793.9 | 792.4 | 30.6 |
| 2003-04 | 2482.4 | 1687.5 | 794.9 | 32.0 |
| 2004-05 | 2347.2 | 1147.6 | 1199.6 | 51.1 |
| 2005-06 | 2298.2 | 952.8 | 1345.5 | 58.5 |
| 2006-07 | 1975.3 | 499.1 | 1476.2 | 74.7 |
| 2007-08 | 1697.2 | 82.1 | 1615.1 | 95.2 |
| 2008-09 | 3664.3 | 1889.4 | 1774.9 | 48.4 |
| 2009-10 | 4472.0 | 2736.6 | 1735.4 | 38.8 |
| 2010-11 | 3628.2 | 1693.1 | 1935.1 | 53.3 |
| 2011-12 | 4568.4 | 2439.9 | 2128.5 | 46.6 |
| 2012-13 | 4384.7 | 2167.9 | 2216.8 | 50.6 |
| 2013-14 | 4283.0 | 1812.1 | 2470.9 | 57.7 |

**Data Source:** RBI Database on Indian Economy, 2014

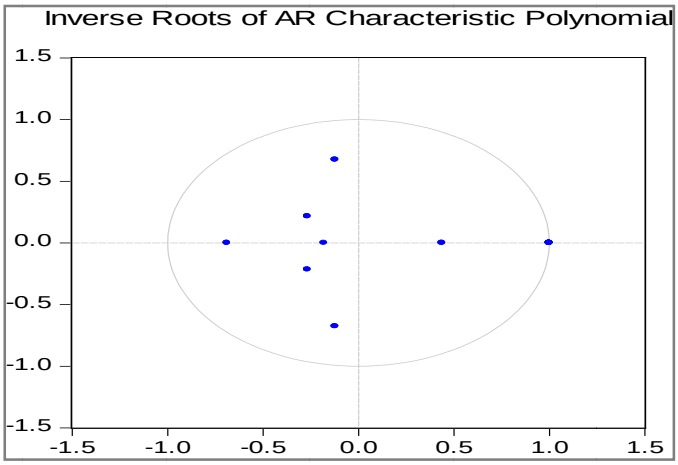
## Appendix-2: Stability Tests of the Models

**Appendix- 2.1 (Stability Test of Model-1)**




Inverted AR roots are within the unit root circle and signify that model is stable.

**Appendix- 2.2 (Stability Test of Model-2)**




Inverted AR roots are within the unit root circle and signify that model is stable.

# Recent Working Papers

**306 Determinants of Capital Structure of Indian Corporate Sector: Evidence of Regulatory Impact**
Kaushik Basu and Meenakshi Rajeev

**307 Where All the Water Has Gone? An Analysis of Unreliable Water Supply in Bangalore City**
Krishna Raj

**308 Urban Property Ownership Records in Karnataka: Computerized Land Registration System for Urban Properties**
S Manasi, K C Smitha, R G Nadadur, N Sivanna, P G Chengappa

**309 Historical Issues and Perspectives of Land Resource Management in India: A Review**
M S Umesh Babu and Sunil Nautiyal

**310 E-Education: An Impact Study of Sankya Programme on Computer Education**
N Sivanna and Suchetha Srinath

**311 Is India's Public Debt Sustainable?**
Krishanu Pradhan

**312 Biomedical Waste Management: Issues and Concerns - A Ward Level Study of Bangalore City**
S Manasi, K S Umamani and N Latha

**313 Trade and Exclusion: Review of Probable Impacts of Organised Retailing on Marginalised Communities in India**
Sobin George

**314 Social Disparity in Child Morbidity and Curative Care: Investigating for Determining Factors from Rural India**
Rajesh Raushan and R Mutharayappa

**315 Is Access to Loan Adequate for Financing Capital Expenditure? A Household Level Analysis on Some Selected States of India**
Manojit Bhattacharjee and Meenakshi Rajeev

**316 Role of Fertility in Changing Age Structure in India: Evidence and Implications**
C M Lakshmana

**317 Healthcare Utilisation Behaviour in India: Socio-economic Disparities and the Effect of Health Insurance**
Amit Kumar Sahoo

**318 Integrated Child Development Services in India – A Sub-National Review**
Jonathan Gangbar, Pavithra Rajan and K Gayithri

**319 The Infrastructure-Output Nexus: Regional Experience from India**
Sumedha Bajar

**320 Uncertainty, Risk and Risk Mitigation: Field Experiences from Farm Sector in Karnataka**
Meenakshi Rajeev and B P Vani

**321 Socio-Economic Disparities in Health-Seeking Behaviour, Health Expenditure and Sources of Finance in Orissa: Evidence from NSSO 2004-05**
Amit Kumar Sahoo and S Madheswaran

**322 Does Living Longer Mean Living Healthier? Exploring Disability-free Life Expectancy in India**
M Benson Thomas, K S James and S Sulaja

**323 Child and Maternal Health and Nutrition in South Asia - Lessons for India**
Pavithra Rajan, Jonathan Gangbar and K Gayithri

**324 Reflecting on the Role of Institutions in the Everyday Lives of Displaced Women: The Case of Ganga-Erosion in Malda, West Bengal**
Priyanka Dutta

**325 Access of Bank Credit to Vulnerable Sections: A Case Study of Karnataka**
Veerashekharappa

**326 Neighbourhood Development and Caste Distribution in Rural India**
Rajesh Raushan and R Mutharayappa

**327 Assessment of India's Fiscal and External Sector Vulnerability: A Balance Sheet Approach**
Krishanu Pradhan

**328 Public Private Partnership's Growth Empirics in India's Infrastructure Development**
Nagesha G and K Gayithri

**329 Identifying the High Linked Sectors for India: An Application of Import-Adjusted Domestic Input-Output Matrix**
Tulika Bhattacharya and Meenakshi Rajeev

**330 Out-Of-Pocket (OOP) Financial Risk Protection: The Role of Health Insurance**
Amit Kumar Sahoo and S Madheswaran

**331 Promises and Paradoxes of SEZs Expansion in India**
Malini L Tantri

**332 Fiscal Sustainability of National Food Security Act, 2013 in India**
Krishanu Pradhan

**333 Intergrated Child Development Services in Karnataka**
Pavithra Rajan, Jonathan Gangbar and K Gayithri

**334 Performance Based Budgeting: Subnational Initiatives in India and China**
K Gayithri

**335 Ricardian Approach to Fiscal Sustainability in India**
Krishanu Pradhan

**336 Performance Analysis of National Highway Public-Private Partnerships (PPPs) in India**
Nagesha G and K Gayithri

**337 The Impact of Infrastructure Provisioning on Inequality: Evidence from India**
Sumedha Bajar and Meenakshi Rajeev

**338 Assessing Export Competitiveness at Commodity Level: Indian Textile Industry as a Case Study**
Tarun Arora

**339 Participation of Scheduled Caste Households in MGNREGS: Evidence from Karnataka**
R Manjula and D Rajasekhar

**340 Relationship Between Services Trade, Economic Growth and External Stabilisation in India: An Empirical Investigation**
Mini Thomas P

Price: ₹ 30.00 ISBN 978-81-7791-223-4



**INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE**
Dr V K R V Rao Road, Nagarabhavi P.O., Bangalore - 560 072, India
Phone: 0091-80-23215468, 23215519, 23215592; Fax: 0091-80-23217008
E-mail: vani@isec.ac.in; Web: www.isec.ac.in