LINKAGE OF DEFICITS, MONEY SUPPLY AND INFLATION IN INDIA IN THE POST REFORM PERIOD

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India has always faced huge fiscal deficits owing to the mounting expenditures which has been the cause of concern for the Indian economy. Fiscal deficits represents the divergence between revenue and expenditure which can have adverse impact on the economy. This phenomenon is witnessed in the Indian economy where fiscal deficits have generated inflation in the post reform era on one hand and on the other it is the broad money supply that has geared the fiscal deficits in the country. The results of granger causality test shows that a unidirectional causality exist between inflation and fiscal deficits with the latter causing the former. So far as broad money supply and fiscal deficits are concerned it is the former causing the latter. Moreover there is absence of long run relationship between inflation and fiscal deficits: and broad money supply and fiscal deficits in India.

Keywords: Fiscal Deficits, Granger Causality, India, Inflation, Money Supply.

INTRODUCTION

A famous English proverb "cut your dress according to your cloth" perfectly suits the Indian economy in the post reform period where in the majority of the years she is grabbed in the trap of mounting fiscal deficits. The prerequisite for economic stability demands harmonization between monetary and fiscal policies. The monetarists held the view that it was the government deficits that was accountable for shooting up of money supply and prices. The conduct of monetary policy by the monetary authority was performed through confining of interest rates instead of money supply. Thus in order to cool the interest rates the surge in money supply was unavoidable. This surge in money supply leads to rise in the price level owing to government deficits. Milton Friedman was of the view that inflation can be curbed if the monetary authorities keep an eye on the money supply while deficits can cause inflation if they are monetised. The contrary view was held by Miller (1983) who believed that deficits always bring about inflation regardless of the fact that they are monetised or not. Actually it is the non monetised deficits that generate high interest rates which reduces private investment and growth of real output given the money supply and elevating the price level.[1]

The objective of this paper is to analyze the link between money supply, inflation and deficits in India in the post reform period.

LITERATURE REVIEW

There are ample of studies done earlier which deal with the association between money supply, inflation and deficits in India and around the world. Some prominent ones are listed below in the form of literature review.

Parida et.al (2001)[2] employed the Vector Autoregressive Model to examine the bond between

money supply, inflation and fiscal deficits in India using annual data covering the period of 1960-61 to 1999-2000. The main inferences drawn from this study were:

a. This study favoured the monetarist view as prices were caused both by fiscal deficits as well as money supply.

b. A bidirectional link was witnessed between money supply and fiscal deficits.

Agha and Khan (2006)[3] tested the connection between fiscal deficits and inflation in Pakistan using annual data covering the period of 1973 to 2003. Inflation was measured in terms of consumer price index, fiscal deficits along with other variables such as real gross domestic product, exchange rates and total bank borrowing (for budgetary support) have been used. Augmented Dickey Fuller unit tests are employed to ensure whether these variables are stationary or not. The results signify that all these variables are integrated of order one. Johensen cointegration technique shows that a long run relation exists between inflation, fiscal deficits and total bank borrowing by the government while the impact of real gross domestic product and exchange rates have taken as exogenous variables. The results of vector error correction models show that inflation is affected by borrowing and fiscal deficits as both these factors are responsible for inflation in Pakistan.

Khundrakpam and Goyal (2009)[4] selected the Autoregressive Distributed Lag Model approach to test the existence of long run relation between, real output, prices and money supply and studied the impact of government deficits on money supply in India covering 1951-52 to 2006-07. The variables used in the study were real output (measured by gross domestic product at factor cost), inflation (by wholesale price index), broad money supply (M_3), reserve money (M_0) and government deficits as a difference between investment and savings of the Government in the National Account Statistics. All the variables were converted in logarithmic forms. To test the presence of cointegration between the variables Autoregressive Distributed lag Model is formulated. Results indicated that government deficit caused reserve money leading to increase in money supply. No proof was found whether money supply caused real output both in short and long run. However money supply led to inflation both in short as well as long run. There was bidirectional causality between money supply and prices. Output too caused prices in short and long run.

Habibullah, Cheah and Baharom (2011)[5] selected thirteen Asian countries namely India, Pakistan, Srilanka, Bangladesh, Indonesia, Malaysia, Philippines, Myanmar, Nepal, Taiwan, Singapore, Thailand and South Korea to investigate the relationship between inflation and budget deficits using annual data covering the period of 1950-1999. The variables used were consumer price index for inflation, broad measure of money supply and the difference of government expenditure and government revenue was used as a proxy for budget deficit. The implementation of Augmented Dickey Fuller tests shows that all these variables are stationary in their first difference form. The Engle Granger test confirm that a long run connection exists between these variables. In case of Srilanka, Bangladesh and South Korea budget deficits were causing inflation while in the remaining countries this phenomenon was not visible.

METHODOLOGY

The paper uses broader measure of money supply (M_3) to study the trends in money supply, fiscal deficits and wholesale price index is used for inflation.The paper uses secondary data on annual basis covering the period of 1991-2014. The data is collected from Handbook of Statistics on Indian Economy available at Reserve Bank of India website.

Time series analysis has been performed on the variables stated above to see the link between these variables in India in the post reform period. The first step is to check the stationarity of the variables as it is a prerequisite for analysing the behaviour of the variables under study. The Augmented Dickey Fuller unit root test is performed to check the level of stationarity of each variable separately (Table 1).

Money supply and inflation are integrated of second order ie the series has been differenced twice to yield stationarity. Fiscal deficits is integrated of first order ie the series has been differenced once to yield stationarity.

Table 1: Stationarity Fiscal Deficits, Monetised Deficits, Broad Money Supply and Inflation in India in the Post Reform Period

Variables	Test Statistic	1 percent	5 percent	10 percent	Remarks
Fiscal Deficits	-5.281	-4.380	-3.60	-3.240	Stationary
Monetised Deficits	-4.400	-4.380	-3.60	-3.240	Stationary
Broad Money Supply (M_3)	-3.966	-4.380	-3.60	-3.240	Stationary at 10 percent
Inflation (wholesale Price Index)	-6.120	-4.380	-3.60	-3.240	Stationary

The series is said to be stationary if the value of the test statistics (in absolute terms) is greater than the critical values at 1 percent, 5 percent and 10 percent.

The results of stationarity of the variables is presented below.

COINTEGRATION

If the variables are integrated of higher order but a linear combination of them has lower order of integration then the variables are said to be cointegrated. It shows long term relationship between the variables. An interesting feature of the presence of cointegration between the variables both of the variables should have same order of integration. If the variables have different order of integration there is absence of cointegration between them.

In the above case both the deficits (fiscal and monetised) are integrated of order one but broad money supply and inflation are integrated of second order. Therefore there is absence of

cointegration of these deficits either with broad money supply or with inflation in India in the post reform period.

Causality between the Variables: Granger Causality Test

This test is applied to see whether the independent variable is the causal factor behind the dependent variable used in the study. The null hypothesis assumes no causality the variables. The result of this test is rejected when the probability value is less than 0.05 indicating that the independent variable is the cause of the dependent variable otherwise the hypothesis is accepted.

Before applying this test it is essential to check the lag at which the variables respond to each other. This is provided by the lag order selection criteria. The results of the same are provided as under:

a.   **Fiscal Deficits and Inflation**

Table 2 : Lag Order Selection of Fiscal Deficits and Inflation

VARSOC Changein Fiscal Deficits Inflation (WPI 2)							
Selection-Order Criteria							
Sample: 1997 - 2014Number of observations = 18							
+--+							
|lag | LL LR df p FPE AIC HQIC SBIC |							
|----+--|							
| 0 | -187.162				4.6e+06	21.0181	21.0317	21.117* |
| 1 | -182.121	10.082	4	0.039	4.1e+06	20.9024	20.9433	21.1992 |
| 2 | -177.922	8.3988	4	0.078	4.1e+06	20.8802	20.9484	21.3749 |
| 3 | -172.257	11.33*	4	0.023	3.6e+06*	20.6952*	20.7907*	21.3877 |
| 4 | -171.028	2.4572	4	0.652	5.5e+06	21.0031	21.1259	21.8935 |
+--+							

Change in FD= FirstOrder Integration of Fiscal Deficits.

WPI2 = Second Order Integration of Inflation.

The values marked in asterisks (*) shows the optimal level of lag selection. Since three out of four criteria select lag 3 (HQIC, FPE and AIC) the optimal lag selection is 3 for fiscal deficits and inflation.

Aninteresting aspect is to investigate the whether increased fiscal deficits has caused inflation in India. The answer is provided by the granger causality test whose result show that there exist a unidirectional causality between fiscal deficits and inflation in India. It is the fiscal deficit one of the causal factors responsible for generating inflationary pressures and not the other way.

Table 3 : Granger Causality Results for Fiscal Deficits and Inflation: Lag 3.

Null Hypothesis	Probability > x^2	Remarks	Causality
FD does not cause WPI	0.00	Null Hypothesis Rejected	Unidirectional
WPI does not cause	0.725	Null Hypothesis Accepted	

FD= Fiscal Deficits

WPI= Wholesale Price Index (Inflation)

Since Probability> x^2 is less than 0.05 percent (0.00<0.05) leading to rejection of null hypothesis. Hence a unidirectional causality exist between fiscal deficit and inflation with fiscal deficits creating inflation and not the other way.

There is absence of cointegration between these two variables as both the series have different order of integration, hence the causality is short run one.

b.   Monetised Deficits and Inflation

Table 4 : Lag Order Selection of Monetised Deficits and Inflation

VARSOC Change in MD andWPI2							
Selection-Order Criteria							
Sample: 1997 - 2014 Number of observations = 18							
+--+							
|lag | LL	LR	df	p	FPE	AIC	HQIC	SBIC |
|----+---|							
| 0 | -197.088				1.4e+07	22.1209	22.1345	22.2198 |
| 1 | -192.589	8.9984	4	0.061	1.3e+07	22.0654	22.1063	22.3622 |
| 2 | -186.936	11.306	4	0.023	1.1e+07	21.8817	21.9499	22.3764 |
| 3 | -179.202	15.467	4	0.004	7.9e+06	21.4669	21.5624	22.1594 |
| 4 | -171.024	16.355*	4	0.003	5.5e+06*	21.0027*	21.1255*	21.8931* |
+--+							

Change in MD= First Order Integration of MonetisedDeficits.

WPI 2 = Second Order Integration of Inflation.

The values marked in asterisks (*) shows the optimal level of lag selection. Since all the four criterias select lag 4 (HQIC, SBIC, FPE and AIC) the optimal lag selection is 4 for monetised deficits and inflation.

Monetised deficits shows the increase in the Reserve Bank of India credit to government. Is this increase in credit responsible for gearing inflation in India? This answer to this is provided by the results of Granger Causality Test which shows that monetised deficits are one of the causal factors of speeding inflation while inflation has also played its part for rapid surge in Reserve Bank of India credit to the government. The result of this is shown in the table below.

Table 5: Granger Causality Results for Monetised Deficits and Inflation: Lag4

Null Hypothesis	Probability > X^2	Remarks	Causality
MD does not cause WPI	0.00	Null Hypothesis Rejected	Bidirectional
WPI does not cause MD	0.001	Null Hypothesis Rejected	

MD= Monetised Deficits

WPI= Wholesale Price Index (inflation)

c.   **Fiscal Deficits and Broad Money Supply**

Table 6 : Showing Lag Order Selection of Fiscal Deficits and Broad Money Supply

VARSOC Changein FD and M32
Selection-Order Criteria
Sample: 1997 - 2014   Number of observations   =   18
+---+
|lag | LL   LR   df   p   FPE   AIC   HQIC   SBIC |
|----+--|
| 0 | -279.18   1.3e+11   31.2422 31.2559 31.3412 |
| 1 | -278.083 2.1938   4 0.700 1.8e+11   31.5648 31.6057 31.8616 |
| 2 | -264.623 26.921   4 0.000 6.3e+10   30.5136 30.5818 31.0083 |
| 3 | -259.916 9.413   4 0.052 6.2e+10   30.4351 30.5306 31.1276 |
| 4 | -250.245 19.342* 4 0.001 3.7e+10* 29.805* 29.9278* 30.6954* |
+---+

Change in FD= First order integration of fiscal deficits.

M32 = Second order integration of broad money supply.

The values marked in asterisks (*) shows the optimal level of lag selection. Since all the four criterias select lag 4 (HQIC, SBIC, FPE and AIC) the optimal lag selection is 4 for fiscal deficits and broad money supply.

It is a common notion that people have more money in hand they would spend more and government of India is not spared from this. Is the excess of money supplied by the monetary authority one of the reason behind the reckless spending by the government? The answer to this is yes. It is the unwarrantedgrowth of money supply which has been one of the factors behind deficits faced by the country.

Moreover these deficits have not forced the monetary authority to pump additional money into the economy. This is seen in the form of existence of unidirectional causality between broad money supply and fiscal deficits in India. Though this causality is short run due to absence of cointegration between these two variables.

Table 7 : Granger Causality Results for Fiscal Deficits and Broad Money Supply: Lag4

Null Hypothesis	Probability > X^2	Remarks	Causality
M3 does not cause FD	0.00	Null Hypothesis Rejected	Unidirectional
FD does not cause M	30.57	Null Hypothesis Accepted	

FD= Fiscal deficits

M3= Broad Money Supply

CONCLUSION

It can be seen that deficits have brought inflation in the country as indicated by the Granger Causality tests. Therefore first and foremost step is to keep inflation under control so as to save the Indian economy from the wrath of inflation and hence the climbing deficits. As far as money supply is concerned excessive money supply has resulted in fuelling fiscal deficits. Therefore the monetary authority should keep a check on money supply so as to keep deficits under control.

NOTES

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