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THE EFFECTIVENESS OF MONETARY POLICY IN MANAGING INFLATION AND REAL GDP IN INDIA

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ABSTRACT:

This study examines the effectiveness of monetary policy in managing inflation and real GDP in India using a multivariate modelling technique of the Vector Auto regression (VAR) and focusing on impact of broad money supply (M2), lending rate, USD exchange rate and domestic credit for the period 1977-2017. The stochastic shocks of monetary policy actions and decisions on the real GDP and inflation were carried out by examining the dynamic nature of Granger Causality Test, Cholesky Ordered Impulse Response Functions and Forecast Error Variance Decomposition for the VAR model. The study found that the potency of monetary policy in influencing real GDP is not limited, as important channels of monetary transmission are fully functional. In particular, the lending rate and exchange rate channel were found weak, even though there is evidence of money supply and domestic credit as the monetary policy instrument exerting significant effects on inflation. This study revealed that money supply, lending rate, domestic credit and exchange rate are important variables in predicting real GDP in the case of India during the study period.

It is recommended that a more contractionary monetary policy should accompany a set of policies geared towards improving investment efficiency and bolstering consumption. In addition, the Reserve Bank of India should entice more reputable foreign banks, especially banks from Europe into the Indian market with a view to importing expertise, increasing competition and more efficiency of bank operations in India.

INTRODUCTION:

The analytics underpinning the monetary policy framework underwent a silent transformation in the late 1990s (Reddy 1999). In its monetary policy statement of April 1998, the Reserve Bank of India (RBI) announced that it would switch to a multiple indicator approach 'to widen the range of variables that could be taken into account for monetary policy purposes rather than rely solely on a single instrument variable such as growth in broad money (M3)'. The era of monetary targeting was drawing to a close and the paradigm in Indian monetary policy was shifting (Rangarajan 2009).

A Liquidity Adjustment Facility (LAF) was put in place in stages, beginning 2000, to facilitate an efficient integration of financial markets. From November 2004, the LAF began to be operated with only overnight repo/reverse repo auctions and longer-term auctions were discontinued, although the RBI retained the option to conduct them at its judgment. Over the ensuing period, the LAF has evolved into the principal operating procedure of monetary policy. In view of persistent and large capital inflows, a Market Stabilization Scheme (MSS) was introduced in 2004 (Mohan 2009). The cash reserve ratio (CRR) has all through been seen as an important instrument in the RBI's arsenal for regulating liquidity in the economy. Nevertheless, the predominant reliance on the LAF for signalling the policy stance by modulating bank reserves has meant that the focus is increasingly on the interest rate as the effective target for monetary policy.

Arguably, the first systematic effort to seek analytical foundations for the new regime in terms of the new Keynesian synthesis can be traced to RBI (2002). While the statistical results therein turned out to be reasonably robust, the empirical exercise was based on annual data with purely backward-looking specifications in an ordinary least squares (OLS) framework. Recent efforts towards evaluation of monetary policy in India have mainly been confined to interest rate and base money type rules (Mohanty and Klau 2004; Virmani 2004; Singh 2010). Yet another strand

of empirical effort has sought to estimate the Phillips curve in standard and augmented backward-looking specifications in the context of the objective of estimating the sacrifice ratio for India (Kapur and Patra 2000) and in the context of modelling inflation expectations (Patra and Ray 2010). Phillips curves and IS curves for India have also been estimated in RBI (2004).

Using monthly data, Goyal (2008) finds a positive coefficient of real interest rate in the aggregate demand equation, which she attributes to long nominal rates not adjusting rapidly in view of interest rates being administered to some extent. Thus, the focus of most studies has been on one or other of the three building blocks of the new Keynesian model in backward looking specifications. The new Keynesian models are not yet useful for policy analysis. The main reason is that model builders in this tradition have added so many free parameters that the features and shocks in their models are

only dubiously structural. Changes in method can make these models potentially useful for policy analysis. Nevertheless, insights provided by these efforts are extremely useful for this paper.

The monetary policy framework has undergone significant transformation in India over time. In the 1960s, inflation was considered to be structural and inflation volatility was attributed to agricultural failure. At this juncture greater reliance was placed on selective credit controls. In the 1970s, there was a surge in inflation on account of monetary expansion induced by expansionary fiscal policies besides the oil price shocks. By the early 1980s, it was argued that while fluctuations in agricultural prices and oil shocks did affect the general price level, sustained inflation since the early 1960s was the aftermath of continuous excessive monetary expansion generated by the large-scale monetization of the fiscal deficit. Since the mid-1990s, apart from dealing with the usual supply shocks, monetary policy had to increasingly contend with external shocks emanating from swings in capital flows, volatility in the exchange rate and global business cycles.

The reforms in monetary and credit policies are aimed at slowing down monetary expansion and thereby controlling inflation. The financial sector reforms were initiated on the recommendations of Narasimham Committee Report. The first phase of reform started with a reduction of Statutory Liquidity Ratio (SLR) and Cash Reserve Ratio (CRR) and permitted a degree of flexibility to the banks in the matter of deposit interest rates. Money markets facilitate the conduct of monetary policy in a country.

The development of money market in India in the last few years has been facilitated by some factors such as a reduction of emphasis on cash reserve ratio as a monetary policy instrument and the development of an array of instruments of indirect monetary control, such as, the Bank Rate and the Liquidity Adjustment Facility (LAF). From the onset of the reforms process, monetary management in terms of framework and instruments has undergone significant changes, reflecting broadly the transition of the economy from a regulated one to liberalized and deregulated regime. While the twin objectives of monetary policy of maintaining price stability and ensuring availability of adequate credit to productive sectors of the economy to support growth have remained unchanged; the relative emphasis on either of these objectives has varied over the year depending on the circumstances. Reflecting the development of financial markets and the opening up of the economy, the use of broad money as an intermediate target has been de-emphasised, but the growth in broad money (M3) continues to be used as an important indicator of monetary policy. The composition of reserve money has also changed with net foreign exchange assets currently accounting for nearly one-half. A multiple indicator approach was adopted in 1998-99, wherein interest rates or rates of return in different markets (money, capital and government securities markets) along with such data

as on currency, credit extended by banks and financial institutions, fiscal position, trade, capital flows, inflation rate, exchange rate, refinancing and transactions in foreign exchange available on high frequency basis were juxtaposed with output data for drawing policy perspectives. Such a shift was gradual and a logical outcome of measures taken over the reform period since early nineties.

RESULTS AND DISCUSSIONS:

4.10 DESCRIPTIVE STATISTICAL ANALYSIS FOR INDIA:

This section examines the distribution of the data using mean, median and standard deviation. The normality of distribution of the variables was also ascertained using skewness, kurtosis and Jacque-Bera tests. The results are presented in Table 4.7

Table 4.7: Summary of Descriptive Statistics

	RGDP	INF	M2	LRATE	CREDIT	EXRATE
Mean	2904498.	7.693415	24948.39	13.64254	32.39856	33.56256
Median	1301788.	8.000000	6960.120	13.50000	24.98500	36.31960
Maximum	12165481	15.32300	116543.4	18.91667	53.97800	67.89800
Minimum	85545.00	-0.364	277.8100	8.333350	17.73100	7.880000
Std. Dev.	3609077.	3.798482	35101.51	2.778116	12.54478	18.76838
Skewness	1.348224	-0.02772	1.490456	-0.04592	0.705523	0.017787
Kurtosis	3.499025	2.548033	3.915157	1.755198	1.784956	1.751682
Jarque-Bera	12.84643	0.354218	16.61072	2.661527	5.923450	2.664255
Probability	0.001623	0.837688	0.000247	0.264275	0.051730	0.263915
Sum	1.19E+08	315.4300	1022884.	559.3442	1328.341	1376.065
Sum Sq. Dev.	5.21E+14	577.1385	4.93E+10	308.7171	6294.864	14090.08
Observations	41	41	41	41	41	41

Source: Author's Estimation, 2017.

The descriptive statistics as evidenced in Table 4.7 reveals the Real GDP (RGDP) as having a larger standard deviation of 3609077 among all the indexed variables which indicates a high volatility in output. The mean-to-median ratio of each variable is approximately 1.

The range of variation between maximum and minimum values is quite logical. The standard deviation in comparison with the mean is low for all the variables which indicate small coefficient of variation. The skewness for RGDP, INF and LRATE reveals approximate normality of these variables; however, CREDIT and M2 indicate distribution of long left tails. EXRATE shows a distribution of long right tail.

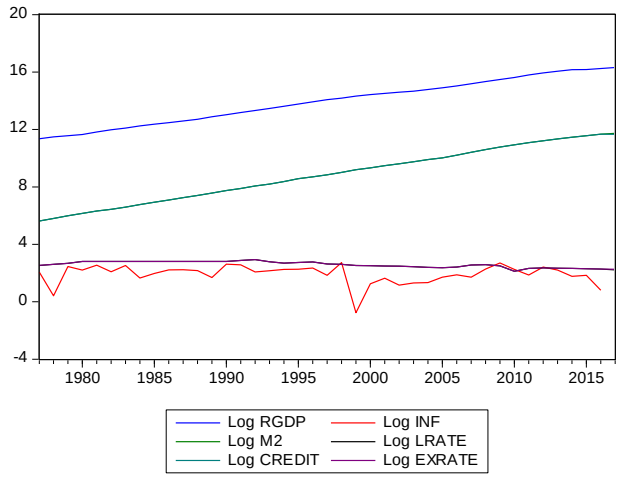
The kurtosis of normal distribution is 3, but the distribution of RGDP, CREDIT, LRATE, and M2 are platykurtic (flat) relative to normality. INF indicates a normal distribution whilst EXRATE indicates a leptokurtic (peaked) distribution relative to the normal. The Jacque-Bera statistics also indicate that the distribution of all the variables during the sample period have long left and right tails and flat than normal distribution. On the whole the Jacque-Bera test of the variables do not conform to the normal distribution but display negative, positive and flat distributions. These results are however, based on the null hypothesis of normality and provide no information for the non-parametric distribution of the series.

4.11 TREND ANALYSIS:

TIME SERIES GRAPHICAL ANALYSIS FOR THE VARIABLES IN INDIA MONEY MARKET:

The trend of the selected variables under study was taken to assess how they have related in the period for the study. The results are shown in Figure 4.4

Figure 4.5: Graphs of Variables from India Money Market in Log Levels



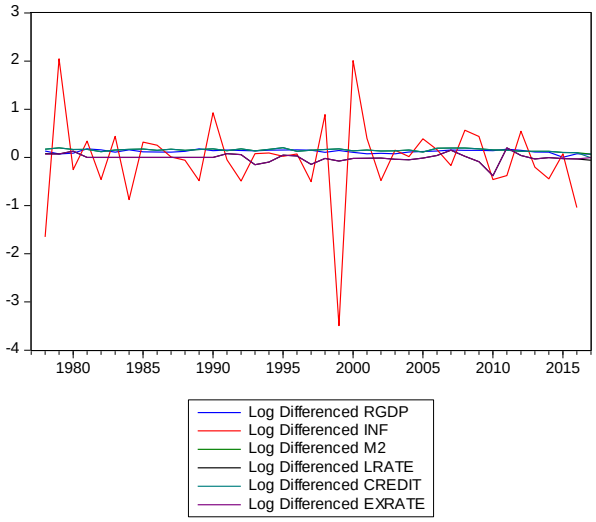
Source: Reserve Bank of India and World Bank Development Indicators, 2017.

The graph reveal that, as money supply and domestic credit increases, real GDP and inflation rate increases: an increase in money supply by Reserve bank of India has helped to increase the domestic credit to private sector which has affected real GDP to increase. The high level of real GDP has also caused inflation in India to decrease drastically. The increased money supply and domestic credit have helped Indians to produce more of their locally products which are of good quality: this has

resulted in increasing exports and decreasing imports which has finally decreased inflation in India drastically to -0.364% in January, 2017.

The increased in money supply has also caused the lending (interest) rate to decrease: This has helped more Indians to get more loans at a very low interest rate which has increased investments, innovations, production, exports and real GDP. The increased in exports and real GDP has also caused the USD dollar to decrease since there is more exports in India than imports. These variables have affected inflation rate in India to decrease drastically since prices of goods and services are very low but of good quality; more of the locally products are sold and used in India than foreign products.

Figure 4.6:Graphs of Differenced Series of Variables in Ghana Money Market



Source: Reserve Bank of India and World Bank Development Indicators, 2017.

On differencing the series once, they tended to fluctuate around their mean suggesting that they became stationary. That is, they tended to exhibit similar behaviour on differencing. This is depicted in figure 4.6**.**

According to Stigler and Sherwin (1985), unrelated variables might have high correlation coefficient using the levels but on differencing, they exhibited low correlation coefficient. However, two related nonstationary variables tended to have high correlation coefficient both in levels and first differences. The real GDP, inflation, the exchange rates, domestic credit, the lending rate and broad money supply exhibited similar movement in first differences as shown in Figure 4.4.

4.12 STATIONARITY TEST:

The time series property of each variable is examined using the Philip-Perron test for the unit root. Once the variables are stationary, the results generated would not be spurious. The results are found in Table 4.8.

Table 4.8: Phillips-Perron Unit Root Test Results

Method	Statistic	Prob.**
PP - Fisher Chi-square	23.4269	0.0243
PP - Choi Z-stat	1.49506	0.9326

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

From Table 4.8, when each variable is examined through level, the calculated PP statistics reject the null hypothesis since the P-Values are more than 5%; that is, the P-Value for PP - Fisher Chi-square is 0.0243 and that of PP - Choi Z-stat is 0.9326. This means that, the variables in the VAR model are not stationary. When each variable is examined through first difference, the calculated PP statistics accepted the null hypothesis that there is no unit root at 5% significant levels when compared with the relative critical values; that is, P-Value for PP - Fisher Chi-square is 0.0000 and that of PP - Choi Z-stat is 0.0000. This means that, the variables in the VAR model are stationary as found in Table 4.9. This paves the way for the study to estimate the VAR model.

Table 4.9 Philip-Perron unit root test at 1st difference

Method	Statistic	Prob.**
PP - Fisher Chi-square	161.891	0.0000
PP - Choi Z-stat	-9.04727	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other test assumes asymptotic normality.

4.13 STABILITY AND RELIABILITY OF THE OPTIMAL LAG VAR MODEL:

It is essential, before estimating a VAR model, to determine the optimal lag length of the model. The AIC was used in selecting the number of lags and it proposed three lags. In the regressions of the base and the extended models, three (3) lags were used as maximum number of lags due to the limited number of observations. The results for checking the optimal lag lengths for the VAR model are presented in table 4.10

Table 4.10Results of Optimal lag length analysis

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1348.18	NA	2.48e+24	73.19900	73.46023	73.29110
1	-1076.82	440.0524	7.62e+18	60.47654	62.30515	61.12121
2	-1015.16	79.99016	2.23e+18	59.08956	62.48555	60.28681
3	-924.918	87.79970	1.89e+17	56.15774	61.12111	57.90756
4	-819.88	68.13322*	1.35e+16*	52.42592*	58.95667*	54.72832*

Note: * Indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final Prediction Error; AIC: Akaike Information Criterion; SC: Schwarz Information Criterion; HQ: Hannan-Quinn Information Criterion.

The inverse roots of the AR characteristics polynomials which lie within the unit circle indicated that there was no problem in terms of stability of four-lag VAR model for the base model and stability of lag-one for RGDP and INF models. Moreover, the reliability of the model whose lag length was determined to be four (4) was also confirmed on the basis of the 0.05 significance level found in three diagnostic tests: namely, the Breusch-Godfrey (Serial Correlation), L.M. White (Heteroskedasticity) and Multivariate normality of the VAR Residuals for all the models.

4.14 RESULTS AND ANALYSIS OF THE BASE VAR MODELS:

From the VAR regression results, the granger causality tests, impulse response functions, and forecast error variance decompositions estimates are derived and presented accordingly by beginning with the base VAR model. Vector auto regression is used extensively in econometric analysis because they are easy to specify and estimate; however, if the process is stationary or involves nonstationary co-integrated variables, it is usually difficult to interpret the VAR coefficients directly (Lütkepohl and Saikkonen, 1995). Therefore, granger causality test, impulse response analysis and forecast error variance decomposition are the alternative approaches proposed which help in understanding the relation among variables of the VAR system. According to Stock and Watson (2001), granger-causality tests, impulse responses and forecast error variance decompositions are more informative to understanding the relationships among the variables than the VAR regression coefficients or R^2 statistics.

4.15 GRANGER CAUSALITY / BLOCK EXOGENEITY TEST: THE BASE MODEL:

The granger causality analysis for the base model is applied to find out if lagged values of broad money supply, lending rate, credit to private sector and exchange rate contain any information that could predict real output, and inflation in India the results are found in Table 4.11.

Table 4.11: Granger Causality Wald Test Result for the Base model

Dependent Variables	Independent Variables			
	M3	LRATE	CREDIT	EXRATE
RGDP	0.0000	0.0021	0.0002	0.0000
INF	0.0881	0.2376	0.0495	0.9968

Entries are P-Values for the X^2 Test

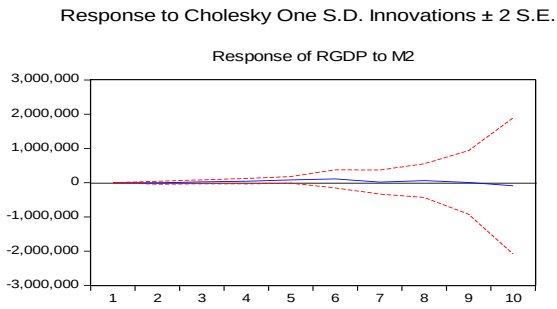
The Granger causality tests in Table 4.11 show that money supply, lending rate, domestic credit to private sector and exchange rate granger cause real GDP at the 5% significance level. The implication is that Past values of money supply, lending rate, domestic credit to private sector and exchange rate can be used to forecast the present value of real GDP.

Domestic credit to private sector and money supply has a significant effect on inflation. However, lending rate and exchange rate do not cause inflation in India. The implication is that Past values of lending rate and exchange rate cannot be used to forecast the present value of inflation. Monetary theory suggests that an increase in money supply leads to an increase in the price level and a potential increase in real GDP.

4.16 IMPULSE RESPONSES FOR THE BASE MODEL:

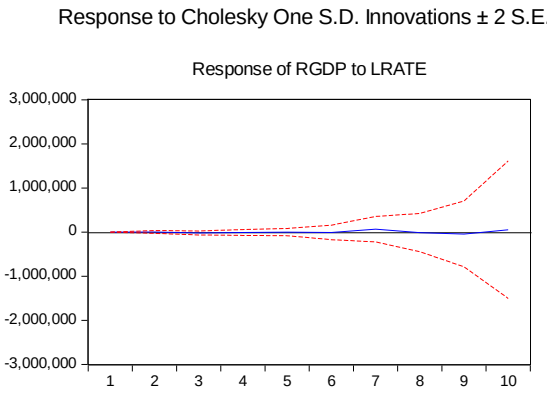
To buttress the information adduced in the granger causality test, a confirmation and direction can be sought by looking at the impulse responses for the overall effect of money supply, lending rate, domestic credit to private sector and exchange rate on real GDP and inflation with the dotted lines representing ±2 standard error confidence intervals and on horizons given 10 year periods.

Figure 4.7a: **Responses of Real GDP to Broad Money (M2)**



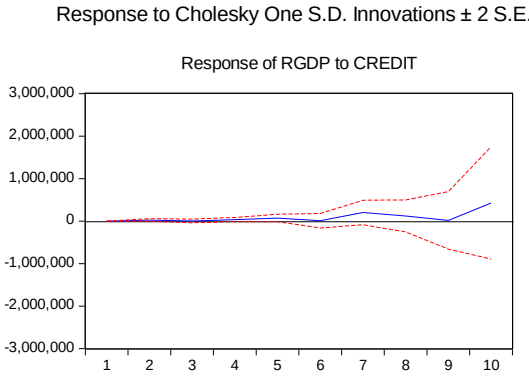
A positive shock to money leads to a positive response of real GDP which is persistent and thus last between the second year through to the tenth year as shown in Figure 4.7a. This confirms the result obtained in the granger causality test. Theoretically Keynes had explained that when money supply increases interest rate falls, investment increases and real GDP increases. Empirical studies such as Fang &Weiya (2011), Ahmed &Suliman (2011) and Hameed and Ume (2011) confirm a strong positive impact of money supply on GDP. The combined Wald Test of the significance of monetary policy having effect on output has been confirmed at 5% level of significance with a p-value of 0.0000. The null hypothesis that monetary policy does not impact on GDP in India is therefore rejected. In India, monetary policy impact on output. [See Appendix 4]

Figure 4.7b: **Responses of Real GDP to Lending Rate**



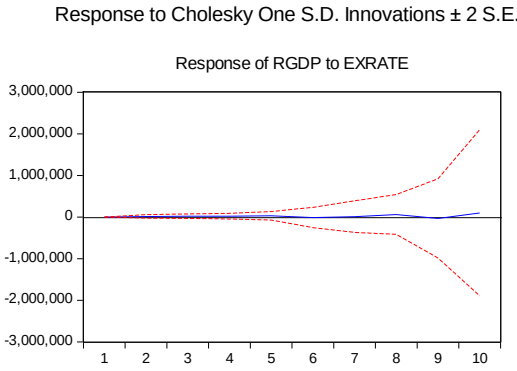
A positive shock to lending rate leads to a negative response of real GDP which is persistent and thus last between the first year through to the tenth year as shown in Figure 4.7b. This confirms the result obtained in the granger causality test. Lower interest rate encourages investments and therefore enhances growth of the economy. The rise in interest rate serves as a disincentive to investment. The fall in investment reduces economic growth. Recent cross country studies which found interest rate affecting economic growth negatively include: Fischer (1993), Barro (1996), Bruno and Easterly (1998).

Figure 4.7c: **Responses of Real GDP to Domestic Credit to Private Sector**



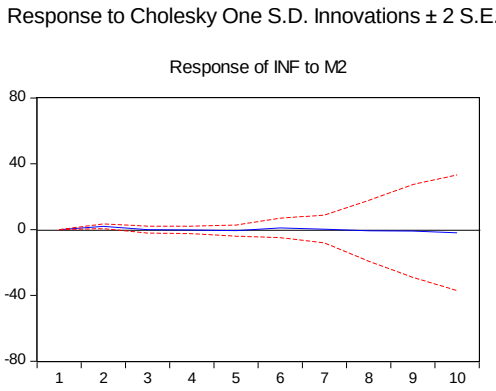
A one standard deviation monetary shock on domestic credit results in a positive impact which is transitory and last between three to five years; responds negatively between the six to the tenth year. This inconsistency vis-à-vis the response of real GDP to domestic credit, as explained above, could be attributed to such other factors as loose monetary policy in the domestic market, differences between domestic and global lending rate and real trade openness. Empirical studies such as Gozgor G &Gozgor K (2013), Kelly, McQuinn& Stuart (2013) and Iwedi, Igbanibo and Onyekachi (2015), confirm a positive relationship between GDP and domestic credit.

Figure 4.7d: **Responses of Real GDP to Exchange Rate**



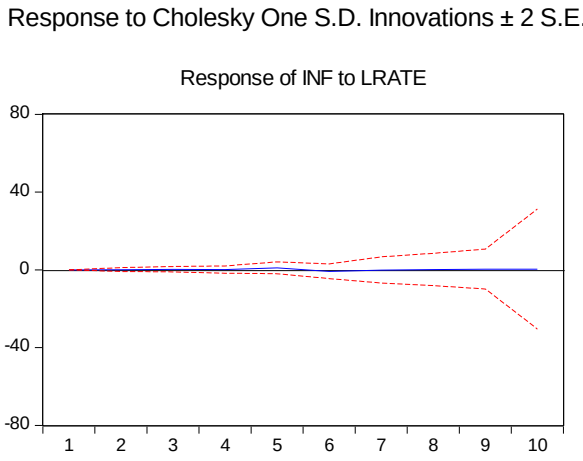
A positive shock to exchange rate leads to a negative response of real GDP which is persistent and thus last be from the first year through to the tenth year as shown in Figure 4.7d. Empirical studies such as Ping HUA (2011), Rodrik (2008), Ito, Isard&Symansky (1999) and Christensen (2012) confirm a negative relationship between GDP and exchange rate,

Figure 4.8a: **Responses of Inflation to Money Supply**



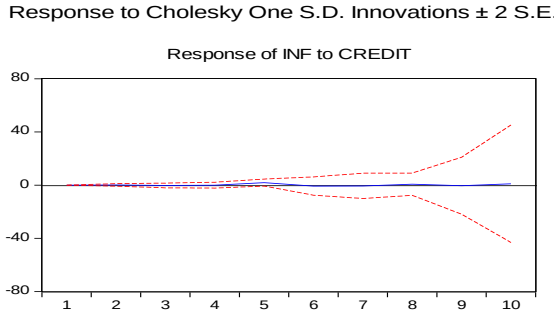
A one standard deviation monetary shock on money supply results in a negative impact which is transitory and last between one to five years; responds positively from the fifth to the tenth year. This inconsistency vis-à-vis the response of inflation to money supply, as explained above, could be attributed to such other factors as instability in the nominal exchange rate and prices of imported goods and not much affected by the actual quantity of money. This results conflict empirical studies such as McCandless& Weber (1995), King (2002) and Walsh (2003) which report on a strong positive impact of money supply on inflation. The combined Wald Test of the significance of monetary policy having effect on inflation has been confirmed at 5% level of significance with a p-value of 0.0033. The null hypothesis is therefore rejected since the p-value is less than 5%. Monetary policy impact on inflation in India.

Figure 4.8b: **Responses of Inflation to Lending Rate**



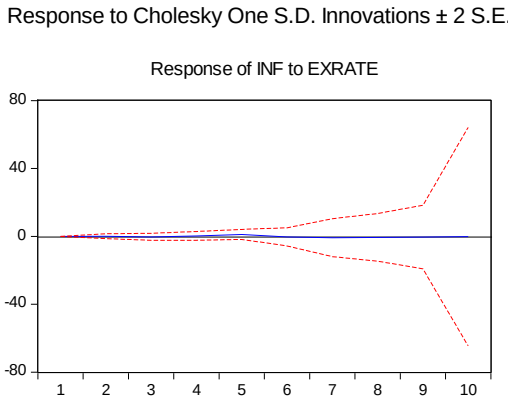
A one standard deviation monetary shock on lending rate results in a negative impact which is transitory and last between one to five years; responds positively between the sixth to the tenth year. This inconsistency vis-à-vis the response of inflation to money supply, as explained above, could be attributed to such other factors as instability in the nominal interest rate. This also confirms the result from granger causality test. Empirical studies such as Thaddeus &Nnneka (2014) and Alex &Inne (2006) confirma negative relationship between inflation and lending (interest) rate.

Figure 4.8c: **Responses of Inflation to Domestic Credit to Private Sector**



A positive shock to domestic credit leads to a positive response of real inflation which is persistent and thus last between the first year through to the tenth year as shown in Figure 4.8c. This confirms the result obtained in the granger causality test. Empirical studies such as Tinoco-Zermeño, Venegas-Martínez& Torres-Preciado (2014), Fokwa& Guy-Paulin (2013) and Korkmaz (2015) confirm a positive relationship between inflation and domestic credit.

Figure 4.8d: **Responses of Inflation to Exchange Rate**



A one standard deviation monetary shock on exchange rate results in a negative impact which is transitory and last between one to three years and from seven to ten years; responds positively between the third to the seventh year. Empirical studies such as Ebiringa, Thaddeus &Nnneka (2014), Albuquerque & Portugal (2005) and Kashif (2015) confirm a negative relationship between inflation and exchange rate.

4.17 FORECAST ERROR VARIANCE DECOMPOSITION: THE BASE MODEL:

The Cholesky Forecast Error Variance Decomposition (FEVD) in table 4.12 gives an idea of the shock of fluctuations in a variable caused by shocks on other variables. The variance decomposition is calculated for the third, sixth and the tenth year.

Table 4.12: Variance Decomposition of Base Model [Ordering reflects Cholesky ordering]

Variance decomposition of:			**Independent Variables**			
	Period	**S.E.**	**M2**	**LRATE**	**CREDIT**	**EXRATE**
RGDP	3	108278.1	4.052368	2.338623	4.978045	5.341748
	6	489163.3	13.14767	0.751333	4.83042	1.375745

	10	2435032.	1.124775	0.765283	4.562923	0.380339
INF	3	3.913214	26.74455	3.388594	0.723847	0.021709
	6	10.22503	4.341794	1.125572	1.986975	0.549752
	10	53.24105	0.505552	1.082646	4.39004	0.478942

Source: Derived from the VAR Base Model Regression

The variance decomposition demonstrate that domestic credit to private sector in India shocks are a very important source of fluctuations in real GDP, accounting for 4.562923% shocks in real GDP in the longer horizon of ten years. Money supply also account for 1.124775% shocks in real GDP in the longer horizon of ten years. Lending (interest) rate accounted for 0.765283% and exchange rate accounted for 0.380339% shocks in real GDP in the longer horizon of ten years.

The variance decomposition demonstrate that domestic credit to private sector shocks are a very important source of fluctuations in inflation, accounting for 4.39004% shocks in inflation in the longer horizon of ten years. Lending (interest) rate also account for 1.082646% shocks in inflation in the longer horizon of ten years. Money supply accounted for 0.505552% and exchange rate accounted for 0.478942% shocks in inflation in the longer horizon of ten years.

SUMMARY OF MAJOR FINDINGS OF THE STUDY:

In the base VAR Model, money supply, lending rate, domestic credit to private sector and exchange rate granger causes real GDP at the 5% significance level. The implication is that Past values of money supply, lending rate, domestic credit to private sector and exchange rate can be used to forecast the present value of real GDP in India.

Moreover, money supply and Domestic credit to private sector have a significant effect/impact on inflation. However, lending rate and exchange rate do not cause inflation in India. The implication is that Past values of lending rate and exchange rate cannot be used to forecast the present value of inflation but past values of money supply and domestic credit can be used to forecast future values of inflation in India.

The variance decomposition demonstrate that domestic credit to private sector in India shocks are a very important source of fluctuations in real GDP, accounting for 4.562923% shocks in real GDP in the longer horizon of ten years. Money supply also account for 1.124775% shocks in real GDP in the longer horizon of ten years. Lending (interest) rate accounted for 0.765283% and exchange rate accounted for 0.380339% shocks in real GDP in the longer horizon of ten years.

The variance decomposition demonstrate that domestic credit to private sector shocks are a very important source of fluctuations in inflation, accounting for 4.39004% shocks in inflation in the longer horizon of ten years. Lending (interest) rate also account for 1.082646% shocks in inflation in the longer horizon of ten years. Money supply accounted for 0.505552% and exchange rate accounted for 0.478942% shocks in inflation in the longer horizon of ten years.

CONCLUSIONS:

The principal objective of this study is to examine the effectiveness of monetary policy in managing inflation and output in India using the technique of vector autoregression. Theoretical and empirical foundations were established to ensure that results obtained could be interpreted within conventional research requirements. A number of revelations emerged from the study.

The analysis and findings reveal that money supply, domestic credit, lending (interest) rate and exchange rate are important sources of real GDP fluctuations in India but money supply has more impact than all the variables at least over the sample period under study. It was also revealed that money supply and domestic credit are important sources of inflation fluctuations in India but domestic credit has more impact than the money supply at least over the sample period under study.

The granger causality, the impulse response functions (IRFs) and the forecast error variance decomposition (FEVD) reveal that real GDP reacts immediately and significantly to contractionary money supply shock in India.

Also, the lending rate channel appears to be strong for transmitting price level disturbances in India. Finally, the analysis reveal that the lending rate and exchange rate channels are not important sources of inflation fluctuations in India at least over the sample period under study.

The study reveals a low inflation (deflation) rate in India as a result of contractionary monetary policy.

5.3 RECOMMENDATIONS AND POLICY IMPLICATIONS:

Though the Reserve Bank of India has come a long way in developing the whole arsenal instruments of monetary policy, there are still some limitations. The following recommendations are, therefore, adduced.

1. Using the credit tool, the Reserve Bank of India should continue to loosen its credit ceilings to support credit expansion for economic growth as done in India. This will result in a more rapid expansion in credit which can lead to somewhat more rapid real GDP growth. The Reserve Bank of India should develop a more active approach to credit policies to support lending by micro finance

institutions and rural banks to ensure effectiveness of the credit channel. This will ensure higher integration of economic agents in the banking system.

2. The interest rate (lending rate) should be more liberalized so that it can reflect the supply and demand of the money market better. Interest rate should be controlled in a more responsive way to catch up with inflation rate as well as to mitigate bad effects on the economy. Increasing rate of inflation should accompany increase in lending rates and vice versa. The Reserve Bank of India should also see to it that there is a strong correlation between the prime rate and commercial banks interest rates. The sizable structural excess reserves of the banking system should be removed using sales of longer maturity securities and foreign exchange operations. It is recommended that, RBI should continue to reduce the lending (interest) rate in order to reduce the demand for credit.

3. The RBI should continue enticing reputable foreign banks, especially Europe Banks, into the Indian market with a view to importing banking expertise, increasing competition and efficiency of bank operations and lowering interest rate spreads among commercial banks. In the medium term, this is capable of enforcing the deepening of financial intermediation which will be crucial to strengthening the interest rate and bank lending channel.

4. Another useful exercise would be to ensure that government policies emanating from the exchange rate channel aim at striking the right balance between necessary flexibility to ensure competiveness and desirable stability to increase confidence in the domestic currency and the underlying fundamentals that provide support to the currency‘s value overtime. According to Ghosh et al (1996), floating exchange rates bring higher economic growth rates. Therefore, widening the trading band for official exchange rate is appropriate. The USD exchange rate in India is too high (INR/$ is 64.442). It is recommended that, exports prices should raise at a great rate than its imports prices so that higher revenue, which causes a higher demand for Indian rupees and an increase in its value.

5. The decreasing rate of monetary policy rate has affected the unemployment rate to increase which is not good for the economy. It is recommended that RBI may introduce expansionary monetary policy to reduce the unemployment rate in the country.

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