The Impact of Monetary Policy on Indian Economy during Post Reform Period

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ABSTRACT

Inflation is a sustained increase in the general price level of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods and services. Consequently, inflation reflects a reduction in the purchasing power per unit of money, a loss of real value in the medium of exchange and unit of account within the economy. A financial crisis is a situation in which the values of assets drop rapidly. While the global financial crisis is spreading fast, policy makers (regulators, central bankers, finance ministers) are desperately trying to cope up with a situation in many ways unprecedentedly. Monetary policy can influence growth by helping to create favorable environment for saving and investment. In this paper an attempt has been made to study the impact of monetary policy on the Indian economy by taking into account inflation and economic growth. The period of study is 25 years from 1991-92 to 2015-16. The Augmented Dickey Fuller (ADF) test, stability test, CUSUM test and pair-wise granger causality test are adopted to find out the impact of monetary policy on Indian economy during post reform period. The result reveals that the monetary policy measures are effective in regulating both inflation and economic growth.

Keywords: Monetary Policy, Inflation, Economic Growth, Indian Economy, Purchasing Power.

INTRODUCTION:

India's monetary policy since the First Plan period has been focusing on providing policy of adequate finance for economic growth and thereby ensuring reasonable price stability. Towards this, RBI helps the economy to expand via expansion of money and credit and attempts to check rise in prices through monetary and other control measures. The liberalization process initiated in the mid 1980s in the Indian economy lacked depth, coverage and self sustaining character. During the fag end of the 1980s, the economy suffered a lot due to a major macro-economic crisis. It manifested initially in the form of foreign exchange crisis, and then debt and interest payment problems. To meet the crisis, India approached the World Bank and the International Monetary Fund (IMF) for a big loan and later, India initiated the new economic policy in July 1991. The reforms in monetary and credit policies aimed at slowing down monetary expansion in turn controlling inflation. Monetary policy is one of the key drivers of economic growth through its impact on economic variables. Economic growth is essential in an economy as it reduces poverty as well as improves livelihood. Despite the lack of consensus among economists, on how monetary policy actually works and on the magnitude of its effect on the economy, there is a remarkable strong agreement to measure its effects on the economy.

REVIEW OF LITERATURE:

Lumengo Bonga-Bonga and Alian Kabundi (2004) endeavored to assess the effectiveness of monetary policy instrument, the repo rate, in influencing inflation rate in South Africa. The framework used is the structural

vector error correction model that facilitates the analysis of the dynamics of inflation to monetary policy instrument shocks. The result reveals that positive monetary policy shocks are unable to negatively affect inflation after a period of more than twenty months.

An attempt was made by Amarasekara C (2007) to analyze the effect of interest rate, money growth and the movements in nominal exchange rate on real GDP growth and inflation in Sri Lanka for the period of 1978-2005. V AR model is used and the result says that positive innovation in interest rate, the GDP growth and inflation decreases while the exchange rate appreciation has an immediate impact on the reduction of inflation.

Chuku A. Chuku (2009) explored the effects of monetary policy in Nigeria by taking into three alternative policy instruments such as Broad money (M2), Minimum Rediscount Rate (MRR) and the Real Effective Exchange Rate (REER). It examined that M2 has modest effects on output and prices with a very fast speed of adjustment. While, innovations on the price-based nominal anchor (MRR and REER) have a neutral and fleeting effect on output and it concludes that the manipulation of the quantity of money (M2) in the economy is the most influential instrument for monetary policy implementation.

Dr. Mukund Chandra Mehta (2011) described the Monetary Policy in India during post reform period and its evaluation.. The Reserve Bank of India keeps control on the supply of money to attain the objectives of its Monetary Policy. It is the management of money supply and interest rates by Central banks to influence prices and employment. It works through expansion or contraction of investment and consumption expenditure. The results revealed that during the reforms, the monetary policy has achieved higher success.

Xuan Vinh Vo et.al (2013) investigated the existence of interest rate channel, exchange rate channel and asset price channel in Vietnam employing VAR model analysis using monthly data ranging from 2003M1 to 2012M12. It tests the existence of three main transmission channels (interest rate channel, exchange rate channel and asset price channel) in monetary transmissions theory and it suggests that interest rate channel through cost channel in Vietnam and there is no evidence of exchange rate channel and asset price channel in 2003 – 2012 period.

STATEMENT OF THE PROBLEM:

Inflation can be a problem, as it can result in economic instability, people being scared to spend money, and ultimately hindering economic growth. It can also cause creditors to lose money and create a negative impact on a country's trade. A big amount of inflation is often viewed as having a negative effect on the economy as it increase in opportunity cost of holding money, discourages investment and savings. It is, therefore, one of the biggest challenges for an economy like India which is on the path of growth and development. The uncertainties that inflation creates make the problem worse as it would lead to the misallocation of resources. Hence it is needed to understand the behavior of inflation and its impact on economic growth of India. With this objective, the following hypotheses are framed.

H_{01} = There is no significant impact of select monetary policy variables on inflation.

H_{02} = There is no significant impact of select monetary policy variables on Gross Domestic Product (GDP).

METHODOLOGY:

This study is based on secondary data. The data collected for the study pertains to a period of 25 years commencing from 1991-92 to 2015-16. The required data are collected from Handbook of Reserve Bank of India, Money Control, World Bank Indicators, International Monetary Fund and International Financial Statistics, apart from referring relevant Books, Journals and Magazines. In this, study inflation rate and GDP are considered as dependent variables. Monetary policy variables (independent variables) considered for this study are Bank Rate, Cash Reserve Ratio, Statutory Liquidity Ratio, Lending Rate, Savings Rate, Exchange Rate, Money Supply, Oil Price, Net Credit to Private Sector, Net Domestic Credit.

RESULTS AND DISCUSSIONS:

Monetary Policy and Inflation:

Inflation occurs when there is a sustained increase in the general price level. It directly affects the life of the common people. Monetary policy can have an effect on inflation. At a time when a country witnesses high inflation rates, the Government often increases the interest rates. High interest rate is a mechanism to control inflation.

Augmented Dickey - Fuller Test (Unit Root Test):

Table 1.1 shows the results of augmented dickey fuller test for the selected variables for the period from 1991-

92 to 2015-16. It depicts the results of the Unit root test applied to determine the order of integration among the time series data. According to the results of the test, INF, BR, CRR, SLR, LR, SR, OP, ER, MS, NCP are not stationary on level, but it became stationary when its first difference was taken. That is, the degree of integration of this series is I (1). NDC are not stationary on level and first difference, but it became stationary when its second difference was taken. That is, the degree of integration of this series is I (2).\

Table 1.1: Augmented Dickey – Fuller test

Variables	Level		1st Difference		2nd Difference	
	t statistics	Prob	t statistics	Prob	t statistics	prob
INF	-2.909	0.177	-6.405	0.000*		
BR	-0.589	0.970	-3.643	0.013*		
CRR	-1.380	0.841	-4.273	0.003*		
ER	-2.755	0.267	-7.243	0.000*		
OP	-1.133	0.902	-4.635	0.001*		
SLR	-1.786	0.679	-3.797	0.009*		
LR	-2.631	0.271	-5.081	0.000*		
SR	-2.640	0.267	-7.243	0.000*		
MS	-3.053	0.139	-8.398	0.000*		
NDC	1.942	1.000	-0.362	0.898	-2.065	0.040*
NCP	-2.412	0.363	-4.186	0.003*		

Source: Computed

Note: i) * 5% significant level ii) BR = Bank Rate, CRR= Cash Reserve Ratio, SLR = Statutory Liquidity Ratio, LR= Lending Rate, SR = Savings Rate, ER = Exchange Rate, MS = Money Supply, OP = Oil Price, NCP = Net Credit to Private Sector, NDC = Net Domestic Credit.

Serial Correlation Test:

In order to test the serial correlation problem, Breusch – Godfrey LM test is used and the results are shown in Table 1.2. It reveals that the probability value of chi-square (0.13) is more than 0.05 at five per cent significant level. Thus, the Breusch – Godfrey Serial Correlation test result concludes that there is no serial correlation in the model.

Table 1.2: Breusch – Godfrey Serial Correlation LM Test - Inflation

F-statistic	0.97
Obs*R-squared	4.07
Prob. F(2,9)	0.42
Prob. Chi-Square(2)	0.13

Source: Computed

Stability test (Cumulative Sum test):
In order to test the stability of the model, Cusum test is used and the results are depicted using line graph which is shown in Figure 1.1. The Cusum test reveals that the curve is within the dotted lines. Thus the model is stable**.**
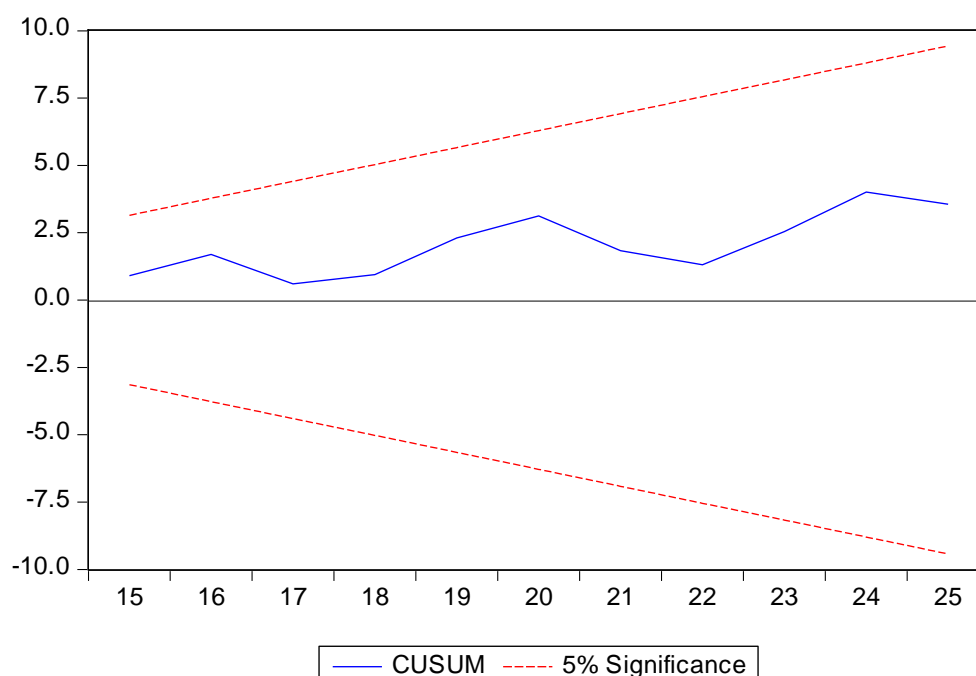
Fig 1.1: Cusum Test for Monetary Policy and Inflation

Regression Analysis (Inflation as a Dependent Variable):

In order to test the impact of select monetary policy variables on inflation, ordinary least square method is adopted and the results are shown in Table 1.3. It reveals that the R^2 is 0.72, indicating that 72 per cent of the variations in the value of inflation are explained by select monetary policy variables. The F statistics of 1.04 with the probability of 0.48 is not significant. The co-efficient of DCRR, DER, DSLR and DSR are negative and hence, these variables have a negative impact on Inflation, whereas DBR, DOP, DLR, DNCP, SDNDC and DMS have a positive impact on the dependent variable. The computed p-values of DCRR, DER, DLR, DSLR, and DSR are less than 0.05 at five per cent level of significance. Hence, the null hypothesis is rejected which shows that these variables have a significant relationship with inflation. The DW statistics of 1.75 reveals that there is no presence of autocorrelation as its value is less than two. Hence, the results are reliable for prediction.

Table 1.3 Ordinary Least Square Regression Analysis of Monetary Policy Variables on Inflation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DBR	1.699504	1.110521	1.530367	0.1542
DCRR	-0.826253	0.964142	-0.856983	0.0097*
DER	-0.433094	0.432100	-1.002301	0.0377*
DLR	0.474730	0.595921	0.796632	0.0425*
DMS	0.081530	0.211038	0.386328	0.7066
DNCP	0.095944	0.685578	0.139946	0.8912
DOP	0.010409	0.054797	0.189961	0.8528
DSLR	-1.646411	0.819002	-2.010266	0.0496*
DSR	-0.200304	0.410407	-0.488060	0.6351
SDNDC	9.20E-13	6.53E-13	1.408709	0.1866
C	-1.086720	1.448508	-0.750234	0.4689
DINF(-1)	-0.086118	0.263306	-0.327066	0.7498
R-squared	0.72			
F-statistic	1.04			
Prob (F-statistic)	0.48			
Durbin-Watson stat	1.75			

Source: Computed

Pair-wise Granger Causality Test:

The results of granger causality test between select monetary policy variables and inflation are given in Table 1.4. The result of granger causality test indicates that there exists a relationship between inflation and few monetary policy variables. However, it can be observed from the table that, the p-values of BR, MS, OP, SR, NDC, and NCP are greater than 0.05 at 5 per cent significant level. Hence, the null hypothesis is accepted indicating that no causality exists between inflation and the above said variables. However, the variables such as CRR, ER, LR and SLR have uni-directional causality with inflation. Therefore, the null hypothesis is rejected for these variables indicating that the causality exists between inflation and CRR, ER, LR and SLR.

Table 1.4: Pairwise Granger Causality Test Results of Monetary Policy and Inflation

Variables	Pair wise Hypothesis	Obs	F Statistic	Prob.	Decision	Type for Causality
BR	DBR does not Granger Cause DINF	22	0.20533	0.8164	DNR H0	No Causality
	DINF does not Granger Cause DBR		0.72107	0.5005	DNR H0	
CRR	DCRR does not Granger Cause DINF	22	1.38295	0.0477*	Reject H0	Uni-directional Causality
	DINF does not Granger Cause DCRR		0.22292	0.8025	DNR H0	
ER	DER does not Granger Cause DINF	22	1.85489	0.0368*	Reject H0	Uni-directional Causality
	DINF does not Granger Cause DER		0.87718	0.4340	DNR H0	
LR	DLR does not Granger Cause DINF	22	1.64086	0.0231*	Reject H0	Uni-directional Causality
	DINF does not Granger Cause DLR		0.02307	0.9772	DNR H0	
MS	DMS does not Granger Cause DINF	22	2.85830	0.0851	DNR H0	No Causality
	DINF does not Granger Cause DMS		0.12548	0.8829	DNR H0	
NCP	DNCP does not Granger Cause DINF	22	2.50497	0.1113	DNR H0	No Causality
	DINF does not Granger Cause DNCP		1.70798	0.2109	DNR H0	
OP	DOP does not Granger Cause DINF	22	0.00812	0.9919	DNR H0	No Causality
	DINF does not Granger Cause DOP		0.26405	0.7710	DNR H0	
SLR	DSLR does not Granger Cause DINF	22	2.51129	0.0108*	Reject H0	Uni-directional Causality
	DINF does not Granger Cause DSLR		2.97763	0.0779	DNR H0	
SR	DSR does not Granger Cause DINF	22	2.25939	0.1349	DNR H0	No Causality
	DINF does not Granger Cause DSR		0.67971	0.5200	DNR H0	
NDC	SDNDC does not Granger Cause DINF	21	1.48245	0.2567	DNR H0	No Causality
	DINF does not Granger Cause SDNDC		0.60250	0.5594	DNR H0	

Source: Computed

Monetary Policy and GDP:
Expansionary monetary policy increases the money supply in an economy. The increase in the money supply is mirrored by an equal increase in nominal output, or Gross Domestic Product (GDP). In addition, the increase in the money supply will lead to an increase in consumer spending.

Serial Correlation Test:
In order to test the serial correlation problem, Breusch – Godfrey LM test is used and the results are shown in Table 1.5. It reveals that the probability value of chi-square (0.11) is more than 0.05 at five per cent significant level. Thus, the Breusch – Godfrey Serial Correlation test result concludes that there is no serial correlation in the model.

Table 1.5: Breusch – Godfrey Serial Correlation LM Test- GDP

F-statistic	2.34
Obs*R-squared	7.87
Prob. F(2,9)	0.15
Prob. Chi-Square(2)	0.11

Source: Computed

Stability test (Cumulative Sum test):
In order to test the stability of the model, Cusum test is used and the results are depicted using line graph which is shown in Figure 1.2. The Cusum test reveals that the curve is within the dotted lines. Thus the model is stable**.**
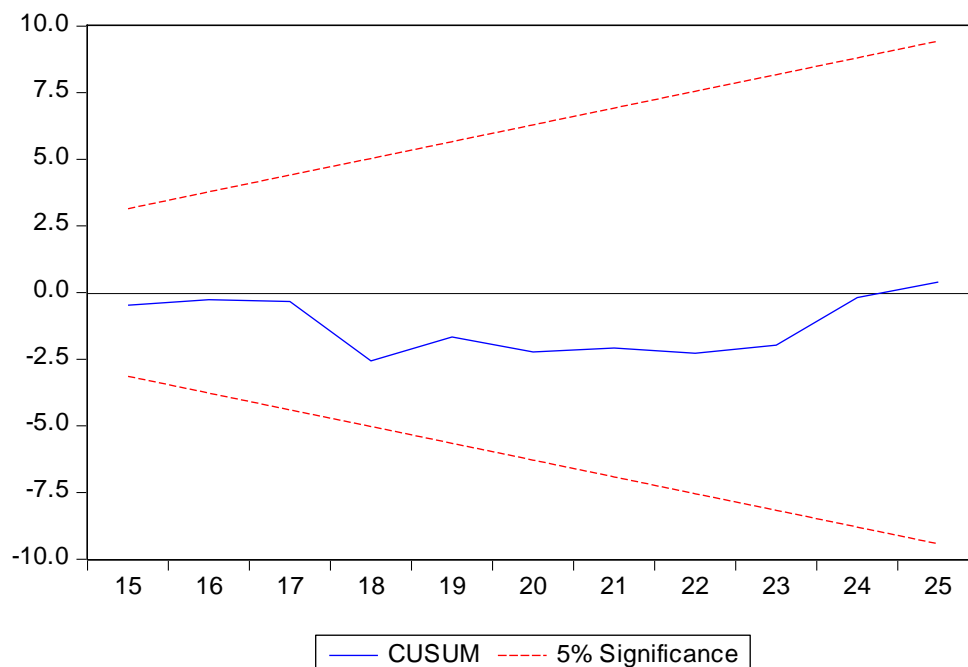
Fig 1.2: Cusum Test for Monetary Policy and GDP

Regression Analysis (GDP as a Dependent Variable):
In order to test the impact of select monetary policy variables on GDP, ordinary least square method is adopted and the results are shown in Table 1.6. It reveals that the R^2 is 0.61 indicating that 61 per cent of the variations in the value of GDP are explained by select monetary policy variables. The F statistics of 1.54 with the probability value of 0.24. The co-efficient of DBR, DLR, DNCP and SDNDC are negative and hence, these variables have a negative impact on GDP, whereas, the variables DCRR, DER, DOP, DMS, DSLR and DSR have a positive impact on the dependent variable. The computed p-values of DCRR, DBR, DMS, DNCP, and DOP are less than five per cent significant level. Hence, the null hypothesis is rejected which shows that these variables have a significant relationship with GDP. The Durbin – Watson statistic is a test for first –order serial correlation. The DW statistics of 1.44 shows that there is no presence of autocorrelation as its value is less than two. Hence, the results are reliable for prediction.

Table 1.6: Ordinary Least Square Regression Analysis of Monetary Policy Variables on GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DBR	-0.299238	0.589872	-0.507294	0.0220*
DCRR	1.213473	0.498445	2.434515	0.0331*
DER	0.148028	0.248621	0.595395	0.5636
DLR	-0.251735	0.346198	-0.727143	0.4823
DMS	0.120810	0.118309	1.021138	0.0291*
DNCP	-0.420270	0.391098	-1.074588	0.0056**
DOP	0.070959	0.030899	2.296497	0.0423*
DSLR	0.726993	0.407139	1.785614	0.1017
DSR	0.093127	0.231342	0.402552	0.6950
SDNDC	-2.92E-13	3.73E-13	-0.782829	0.4503
C	6.850336	2.060309	3.324907	0.0068
GDP(-1)	0.186771	0.272356	0.685758	0.5071
R-squared		0.61		
F-statistic		1.54		
Prob(F-statistic)		0.24		
Durbin-Watson stat		1.44		

Source: Computed

Granger Causality Test:

Table 1.7 Pair-wise Granger Causality Test Results of Monetary Policy Variables and GDP

Variables	Pair wise Hypothesis	Obs	F Statistic	Prob.	Decision	Type for Causality
BR	DBR does not Granger Cause GDP	22	0.34303	0.0144*	Reject H0	Uni-directional Causality
	GDP does not Granger Cause DBR		1.37545	0.2795	DNR H0	
CRR	DCRR does not Granger Cause GDP	22	0.20366	0.0177*	Reject H0	Uni-directional Causality
	GDP does not Granger Cause DCRR		1.48792	0.2538	DNR H0	
ER	DER does not Granger Cause GDP	22	2.39739	0.1210	DNR H0	Uni-directional Causality
	GDP does not Granger Cause DER		4.31053	0.0306*	Reject H0	
LR	DLR does not Granger Cause GDP	22	0.04387	0.9572	DNR H0	No Causality
	GDP does not Granger Cause DLR		3.03372	0.0747	DNR H0	
MS	DMS does not Granger Cause GDP	22	0.06733	0.0351*	Reject H0	Uni-directional Causality
	GDP does not Granger Cause DMS		0.39726	0.6782	DNR H0	
NCP	DNCP does not Granger Cause GDP	22	0.95534	0.4044	DNR H0	Uni-directional Causality
	GDP does not Granger Cause DNCP		7.00809	0.0060*	Reject H0	

Variables	Pair wise Hypothesis	Obs	F Statistic	Prob.	Decision	Type for Causality
OP	DOP does not Granger Cause GDP	22	0.29959	0.0450*	Reject H0	Uni-directional Causality
	GDP does not Granger Cause DOP		0.13983	0.8705	DNR H0	
SLR	DSLR does not Granger Cause GDP	22	3.20454	0.0659	DNR H0	No Causality
	GDP does not Granger Cause DSLR		0.80468	0.4636	DNR H0	
SR	DSR does not Granger Cause GDP	22	0.28892	0.7527	DNR H0	No Causality
	GDP does not Granger Cause DSR		1.65856	0.2198	DNR H0	
NDC	SDNDC does not Granger Cause GDP	21	0.57298	0.5750	DNR H0	No Causality
	GDP does not Granger Cause SDNDC		0.76312	0.4824	DNR H0	

Source: Computed

The results of granger causality test between select monetary policy variables and GDP are given in Table 1.7. The result of granger causality test indicates that there exists a relationship between GDP and few monetary policy variables. However, it can be observed from the table that, the probability values of LR, SLR, SR and NDC are greater than 0.05 at five per cent significant level. Hence, the null hypothesis is accepted indicating that no causality exists between GDP and the above said variables. However, the variables BR, CRR, ER, MS, OP, and NCP have uni-directional causality with GDP. Therefore, the null hypotheses is rejected for these variables indicating that the causality exists between GDP and BR, CRR, ER, MS, OP, and NCP.

CONCLUSION:

The present study was an attempt to analyze systematically the techniques of monetary control measures with its relevance and changing importance and to find out their effectiveness in the Indian context especially to achieve the thriving objectives of economic development. There is definite and remarkable economic impact of monetary policy on Indian economy in the post-reform period. Especially the previous decade, described as the Decade of Reforms for the Indian economy, was successful in eliciting supply responses as evidenced in the higher growth of GDP. Apart from these, the use of monetary weapons like Bank rate, CRR, SLR, Lending rate, Savings rate, etc, have increased over the years. The rates are varied mainly to curtail inflation, absorb the excess liquidity and thus to maintain development of the economy. Therefore, the short-time objective of monetary policy is more successful on Indian economy rather than other long-term objectives of development.

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