

IMPACT OF MONETARY POLICY INSTRUMENTS ON INFLATION FROM 2010 TO 2019

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ABSTRACT: Monetary policy of India is the regulatory policy which enables the Reserve Bank of India to control the supply of money, availability of credit and interest rate in the economy. The main aim of monetary policy is to ensure financial stability along with controlling inflation. RBI also through monetary policy ensures that the growth of the economy is not sacrificed. Financial stability is the ability of the economy to absorb shocks and ensure that the people retain their confidence in the financial system of India. RBI uses various monetary instruments like bank rate, repo rate, reverse repo rate, CRR and SLR to achieve its objective of ensuring financial stability and controlling inflation in India. The present paper discusses the impact of various monetary policy instruments on inflation and money supply for a period of 10 years. The study also focusses on the relationship between inflation and money supply.

KEYWORDS: Financial stability, Inflation, Monetary policy, Reserve bank of India, Repo rate, Reverse repo rate, CRR, SLR

I. INTRODUCTION

Monetary policy is the macroeconomic policy laid down by the Reserve Bank of India. It refers to the policy of the central bank with regard to monetary instruments under its control while maintaining price stability keeping in mind the objective of growth. It is a process by which RBI manages money supply in the economy. The objective of monetary policy also include ensuring inflation targeting and price stability. RBI executes its monetary policy through various qualitative and quantitative instruments like open market operations, bank rate policy, reserve ratio and others. Instruments of monetary policy considered for study are:

Bank Rate Policy: The bank rate is the minimum lending rate of the RBI at which it rediscounts bills of exchange and government securities held by commercial banks.

Repo Rate: Repo rate is the rate at which the RBI lends to commercial banks, typically, against government securities.

Reverse Repo Rate: Reverse repo rate is the rate at which RBI borrow money from banks when there is excess liquidity in the market.

CRR: Cash Reserve Ratio or CRR is the requirement set by RBI for domestic banks to maintain a minimum amount of cash reserve to meet payment obligations. Under this a certain percentage of total bank deposits has to be kept in the form of cash in the current account of the RBI.

SLR: Statutory Liquid Ratio or SLR is the percentage of funds banks need to maintain in the form of liquid assets at any point of time. But banks need to maintain these assets in the form of government securities, bonds or precious metals and not in the form of cash.

Inflation: Inflation is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over some period of time. In India, inflation is primarily measured by two main indices — WPI (Wholesale Price Index) and CPI (Consumer Price Index), which measure wholesale and retail-level price changes, respectively.

Money Supply: The money supply is the total value of money available in an economy at a point of time. The circulating money involves the currency, printed notes, money in the deposit accounts and in the form of other liquid assets.

There is no one way to calculate the money supply in our economy. Instead, the Reserve Bank of India has developed four alternative measures of money supply in India. These four alternative measures of money supply are labelled M1, M2, M3 and M4.

- **M1 (Narrow Money):** M1 includes all the currency notes being held by the public on any given day. It also includes all the demand deposits with all the banks in the country, both savings as well as current account deposits. It also includes all the other deposits of the banks kept with the RBI.
- **M2:** M2, also narrow money, includes all the inclusions of M1 and additionally also includes the saving deposits of the post office banks.
- **M3 (Broad Money):** M3 consists of all currency notes held by the public, all demand deposits with the bank, deposits of all the banks with the RBI and the net Time Deposits of all the banks in the country.
- **M4:** M4 is the widest measure of money supply that the RBI uses. It includes all the aspects of M3 and also includes the savings of the post office banks of the country. It is the least liquid measure of all of them.

II. REVIEW OF LITERATURE

- Upasana Thakur, Shivani Vaid and Dr. Mamta Sharma in their paper analysed the role of monetary policy instruments on money supply in the economy. They also analysed the extent to which the money supply influences the inflation in the economy.
- Khairul Kabir Sumon¹ and Md. Sazib Miyan in their paper examined empirically the relationship between inflation and economic growth in Bangladesh using annual data set from 1986 to 2016. The results confirmed that there is significant relationship between inflation and economic growth.
- Moid U. Ahmad and Shamima Nasrin in their research attempted to test and verify the effectiveness of changes in the monetary policy rates on variables like inflation, GDP, velocity of money etc.
- Ifionu Ebele and Akinpelumi, Omotoyo. F in their paper reviewed the effect of selected macroeconomic variables on money supply.

Need For The Study

Reserve bank of India being the central bank takes all the necessary steps to accelerate the economic growth of the country while maintaining financial stability. For this RBI uses various monetary instruments to control the money supply in the economy which in turn effects the inflation rate. The paper tries to understand the dynamics between inflation, money supply and other monetary policy instruments and understand the strength of the relationship among them. The paper also focusses on the inflation method adopted by RBI and also the ability of the central bank to predict inflation. The study uses statistical techniques like correlation and regression analysis and draws conclusion based on the results.

Objectives of the study:

- To analyze the kind of inflation measure being taken by RBI for monetary policy.
- To study the ability of the central bank to predict inflation for a stable monetary policy.
- To study the interrelationship among selected macro-economic variables.
- To understand whether there is any significant relationship between money supply and inflation.

Hypothesis:

H₀: There is no significant relationship between money supply and inflation.

H₁: There is significant relationship between money supply and inflation.

Scope of the study:

The study was conducted for a period of 10 years i.e., from December 2010 to December 2019 for analyzing the impact of various monetary policy variables on money supply and inflation. Consumer price index (CPI) which measures the retail level price changes is considered as the measure of inflation for the study. Similarly broad money (M3) is considered as money supply for the purpose of the study.

III. RESEARCH METHODOLOGY

For the purpose of analysis data was collected from secondary sources namely various research and websites. Most of the secondary data was collected from rbi.org.in.

Inflation Measure Taken By Rbi

The fluctuations in the price movements in India can be measured either in terms of the Wholesale Price Index (WPI), or the Implicit National Income Deflator (NID). It can also be measured through the Consumer Price Index (CPI).

The WPI is the widely used to measure the rate of inflation in India. The WPI is used for all kinds of commodities. The biggest advantage of this kind of inflation is that, it is available situation for policy purposes. However this index does not cover non-commodity producing sectors like services.

The national income deflator is a comprehensive measure and is statistically derived from national accounts data released by the Central Statistical Organisation (CSO). This is arrived at as a ratio of GDP at current prices to GDP at constant prices. Since it covers the entire spectrum of economic activities including services, the scope and coverage of national income deflator is wider than any other measure. However the major drawback is that, as of now, the deflator is available only on a yearly basis and because of that, cannot be used for the conduct of policy.

The important measure at the point of consumption is the Consumer Price Index (CPI), which is meant to understand the cost of living conditions and is calculated on the basis of the fluctuations in the level of retail prices of selected goods and services on which a large part of diversified group of consumers spend the substantial portion of their income. While all these measures has its own advantages and disadvantages, the decided measure of inflation should be able to describe the relationship between demand and supply forces in the economy at regular time periods and covers wider sections of society.

Since Consumer Price Index (CPI) touches upon huge population, this measure is taken for the study.

The Rbi's Inflation Forecasting

The Reserve Bank of India, for forecasting inflation uses a weighted combination of the outputs from different models. They are the relatively easy random walk model to an auto regression model and, Phillips curve model.

The Random Walk model: The random walk model talks about the variable being forecasted which follows a random and totally unpredictable path, so that prior data points are rendered irrelevant in predicting the future values of the variable. Without going into the specifics, it can be said that the model completely excludes the possibility of any strong, mean-reverting level. The output is defined by its instability and therefore, is understood that, it cannot be totally used.

Auto – Regressive Model: Auto – Regressive Model conceptually, is strong in its forecasting ability. Such a time-series model is based on the assumption that any future value of inflation, which is a dependent variable is a function of its own value during previous period. There are quite a few limitations though, like the correlation between the two-time series (independent variable and dependent variable). Yet, with proper adjustments, it is a good model to use.

Phillips Curve Model: The next model is the widely accepted and followed model- the Phillips curve model. In this also, one forecasts a time series using more than one variable. There is strong statistical evidence to prove that the assumption of this model- a perennial inverse relationship between the rate of inflation and the rate of unemployment in an economy, is perfect. However, the model has hardly ever improved upon the forecast of the univariate, random-walk models that was referred previously. Therefore its additional, synergistic value in a basket of models, is close to zero.

Riddled with Inconsistencies: The truth behind the façade is that the RBI is bluffing about 'core' inflation. To put things in perspective, the core inflation doesn't include changes in the prices of food and fuel. The other metric of inflation is 'headline' inflation, which refers to the inflation as reported by the CPI, including the prices of commodities such as food, oil, and gas. The prices of such commodities tend to be very volatile and are subject to much more fluctuations in the short-term. It is the core inflation that is a more critical input to the forecasting and policy making process. Given the consistently erroneous forecasts of core inflation and the lack of surety even on the RBI's part, it is no surprise that even previously documented values of core inflation are off-the-mark.

However, here are significant mathematical limitations that are common to almost all the models used for generating forecasts. There is a requirement for correctly expressed previous period and current period data.. Also, all the models will work only if there is a linear relationship between inflation and its explanatory variables- which is a rare case in the real world. There are other aspects like having a finite and constant mean, variance and covariance across the time series, which have a compounding effect on the already recorded error. However RBI, as one of the finest central bank in the world is putting all efforts to come out with a more or less headline and core inflation are crucial to the entire monetary policy framework.

Analysis and interpretation:

The following variables are considered for study the impact of inflation on monetary variables of RBI. The variables was collected and analyzed for a period of 10 years.

Table: 1 Table Showing Variables Selected for the Study

Year	Inflation	Bank Rate	Repo Rate	Reverse Repo Rate	CRR	SLR	Money Supply (Rs. in billion)	Growth in money supply (%)
2010	10.53	6	6.25	5.25	6	24	56027	16.9
2011	9.5	6	8.5	7.5	6	24	65041.2	16.1
2012	10	9	8	7	4.25	23	73848.3	13.5
2013	9.4	8.75	7.75	6.75	4	23	83898.2	13.6
2014	5.8	9	8	7	4	22	95173.9	13.4
2015	4.9	7.75	6.75	5.75	4	21.5	105501.7	10.9
2016	4.5	6.75	6.25	5.75	4	20.75	116176.2	10.1
2017	3.6	6.25	6	5.75	4	19.5	127919.4	10.1
2018	3.43	6.75	6.5	6.25	4	19.5	140114.1	9.5
2019	4.54	5.4	5.15	4.9	4	18.5	154424.7	10.2

Interpretation: It is evident from the above table that there is decrease in the growth of money supply during the study period and inflation also has showed a decline during the study period. In the year 2019 both inflation rate and growth in money supply showed a slight increase. All the other variables considered for study namely bank rate, repo rate, reverse repo rate, CRR and SLR are also showing a declining trend from the year 2012. However there is a slight increase in the bank rate, repo rate and reverse repo rate in the year 2018 which again showed a decline in the year 2019.

Table: 2 Correlation Analysis of Variables Selected for the Study

Variables	Money Supply (YoY %)	Inflation	Bank Rate	Repo Rate	Reverse Repo Rate	CRR	SLR
Money Supply (YoY %)	1						
Inflation	0.91	1					
Bank rate	0.11	0.25	1				
Repo	0.58	0.59	0.64	1			
Reverse Repo	0.41	0.42	0.58	0.96	1		
CRR	0.83	0.67	-0.41	0.26	0.15	1	
SLR	0.92	0.91	0.35	0.74	0.56	0.68	1

Interpretation: The above table depicts the correlation analysis of the variables considered for study. Correlation measures the strength of relationship between two variables. High positive correlation implies that both the variables are moving in the same direction and negative correlation implies that both the variables are moving in the opposite direction.

It is evident from the above table that Money supply and inflation is showing high positive correlation implying that increase in money supply leads to increase in the inflation. Similarly there is positive correlation of money

supply with both CRR and SLR. There is moderate positive correlation of money supply with repo rate and reverse repo rate. Similarly there is low positive correlation between money supply and bank rate.

Inflation is showing high positive correlation with SLR and CRR and moderate to low positive correlation with repo rate, reverse repo rate and bank rate.

Repo rate is showing high positive correlation with reverse repo rate and positive to moderate positive correlation with CRR and SLR.

Reverse repo rate is showing moderate correlation with SLR and low correlation with CRR.

Regression Analysis between Money supply and Inflation

Regression analysis is a statistical model for explain the relationship between the dependent and independent variable. In case of simple regressions analysis there is one dependent variable and one independent variable. In case of our study inflation is considered as dependent variable and money supply is considered as an independent variable.

Regression Model in this particular case is as follows:

$$\text{Inflation} = b_0 + b_1 (\text{Money Supply})$$

Table: 3 Regression Statistics

Multiple R	0.910748
R Square	0.829461
Adjusted R Square	0.808144
Standard Error	1.16494
Observations	10

Interpretation: This model is helpful to know the strength of relationship between the dependent variable money supply and independent variable inflation. Multiple R is multiple correlation coefficient which is 0.910748 which implies high degree of positive correlation between the dependent and independent variable. R square is a measure of coefficient of determination and it explains that 82.95% of the data is explained by the regression model which implies that 82.95% of variation of dependent variable is explained by independent variable namely inflation.

Table: 4 ANOVA

Particulars	df	SS	MS	F	Significance F
Regression	1	61.86548	61.86548	39.2239	0.000242
Residual	8	12.61792	1.57724		
Total	9	74.4834			

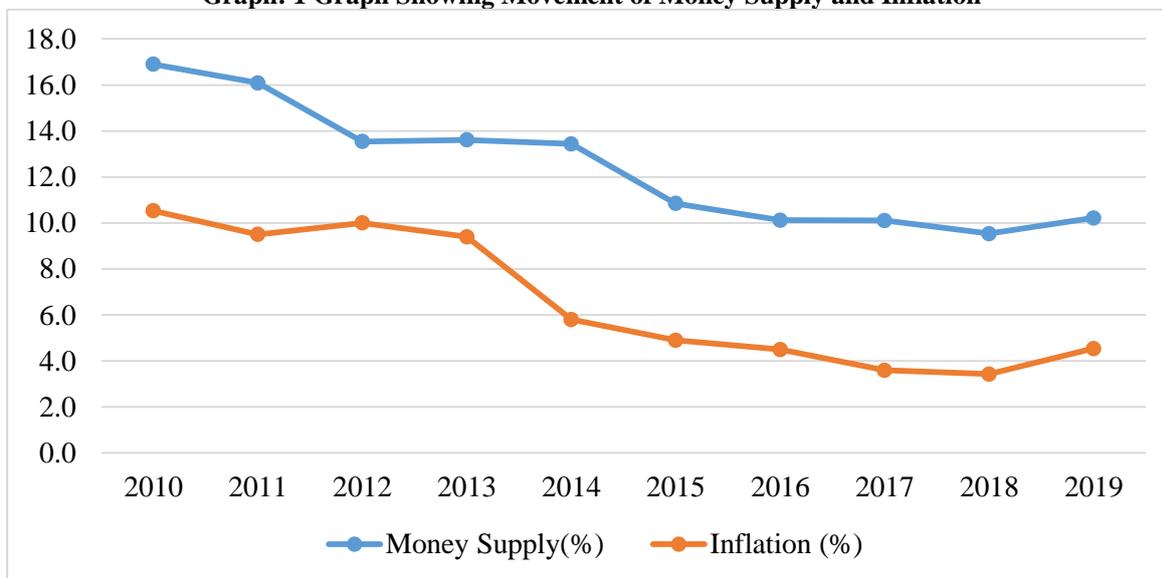
Interpretation: From the above table it is clear that the significance level of 0.000242 is less than the significance level of 0.05, it implies that the model is statistically significant.

Table: 5 Coefficients

Particulars	Coefficients	Standard Error	t Stat	P-value
Intercept	-5.65473994	1.999746	-2.82773	0.022228
Money Supply (%)	0.98669556	0.157546	6.262899	0.000242

Interpretation: Money supply has a t statistic of 6.262899 and p value of 0.000242 which implies that p value is less than the significance level of 0.05, hence the null hypothesis is rejected and alternative hypothesis is accepted which states that there is significant relationship between inflation and money supply.

Graph: 1 Graph Showing Movement of Money Supply and Inflation



Interpretation: The above chart clearly depicts that both money supply and inflation are moving parallel to each other indicating positive relationship between as it is clear from the above model.

IV. CONCLUSION

It is evident from the study that there is significant relationship between inflation and money supply and both are positively correlated which implies that when there is increase in inflation money supply also increases. Similarly it is also evident from the study that all the instruments of monetary policy are positively correlated with inflation and money supply. However it should be remembered that apart from inflation there are many other factors which impact money supply namely velocity of circulation, state of the economy, growth rate of the country etc. However through proper planning and use of various monetary policy instruments, RBI has to a great extent able to control inflation and money supply in the economy.

V. REFERENCES

- [1] Upasana Thakur, Shivani Vaid and Dr. Mamta Sharma (2016), “RBI’s monetary policy: Its impact and implications on money supply and inflation”, *International Journal of Multidisciplinary Research and Development*, Volume 3(11), pp 161-163.
- [2] Khairul Kabir Sumon1 and Md. Sazib Miyan (2017), “Inflation and Economic Growth: An Empirical Evidence of Bangladesh (1986-2016)”, *International Journal of Economics and Financial Issues*, Volume 7, Issue 5, pp 454-464.
- [3] Moid U. Ahmad and Shamima Nasrin (2017), “An analysis of the effect of monetary policy changes on macroeconomic factors”, *Theoretical and Applied Economics*, Volume 24, No. 2 (611), pp. 307-322.
- [4] Ifionu, Ebele and Akinpelumi, Omotoyo. F (2015), “Macroeconomic Variables and Money Supply: Evidence from Nigeria”, *African Research Review*, Volume 9(4), pp 284 to 307
- [5] Retrieved from <https://www.indiamacroadvisors.com/page/category/economic-indicators/money-and-banking/money-supply/>
- [6] Retrieved from <https://www.macrotrends.net/countries/IND/india/inflation-rate-cpi>
- [7] Retrieved from https://www.rbi.org.in/scripts/chro_bankrate.aspx

