EFFECTIVENESS OF MONETARY POLICY IN CURBING INFLATION: A CASE STUDY OF INDIA

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Abstract

Various studies have reflected the existence of a positive relationship between the increase of money supply and the level of inflation. Generally, this is reflected by the continued rise of prices of the various products. A situation ensues where excess amounts of money tend to be chasing too few goods. In this perspective, this study tested on whether monetary policy is an effective tool in the combating of inflation. The data utilized was derived from India's economic situations over a range of years. The period in perspective was that between the years 2000-01 and 2013-14. During this period, India faced various catastrophic economic events. Some instances of depressions, and economic recessions were vividly witnessed. In addition, the level of inflation was at an all-time high. During this duration, various monetary policies and tools were utilized by the Reserve Bank of India. The research used ordinary least square model (regression model) in the endeavor. The research found out the money supply has a direct impact on the level of inflation. Statistically, money supply has a statistical significance on the level of inflation in the country. Thus, monetary policies aimed at controlling the amount of money supply in the economy, have a tremendous impact on controlling the level of inflation.

Keywords: Money supply, Inflation, economic policies, foreign exchange, interest rates.

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1. Introduction

Since time immemorial, inflation has always been an issue of extreme sensitivity. This accrues to the fact that a case of inflation has overall effect on the prices of commodities. An instance of spiraling, uncontrollable inflation is usually a sign of impending catastrophic doom. Thus, the control of monetary policy has turned out to be an essential function of all governments in the world. Inflation does not necessarily have to be reflected a continued increase in the prices of commodities (hyperinflation), the vice versa can also be a reflection of inflation (deflation). However, both situations are more than unhealthy for the economy. In most economic situations, the major reasons for the inception of inflation are a culmination of excessive demand for products. The necessary economic policy would thus be entrenched on looking at the causes of an unnecessary rise. This way, they can thus be able to come up with the right measures that can aid in controlling the existing overall demand in an economy. An epitome of this can be the control of cost-push inflation where cost is deciphered as the sole reason for an increase in demand of both services and goods. The cost of production can then be checked so as to combat problems related to inflation.

To this end, various researchers have established the ability of monetary policy as a tool for controlling inflation. All over the world, in diverse economies, monetary policy has been seen as an approach to effectively control inflation. This is reflected by the ability of monetary policy in controlling the rise in demand by an increase in the available rates of interest. In addition, monetary policy reduces the existing real money in the economy. A rise in the interest manages to bring an overall reduction in collective demand in an economy. To this end, this paper aims at looking at how effective monetary policy as a tool for controlling inflation.

2. Literature Review

Proponents of inflation targeting (Bermanke et al, 1999 Nadal De Simone, 2001; Carbe, Lindererretche, and Schmit-hebbel 2002) demonstrate empirically that inflation targeting associated with the improvement in overall economic performance. According to this author the rationale behind this success is that by targeting directly price, inflation target plays a role of explicit and strong nominal anchor. The implications of inflation targeting policy necessitates that monetary authority announces the numerical target .The central bank should also set out the period within which inflation will reach the target level.

The results of different studies suggest that inflation levels, persistence, and volatility are lower in inflation targeting countries than in non-targeters. Johnson (2003) provides a strong evidence of an immediate fall of inflation expectations after an adoption of inflation targeting. Levin, Natalucci and Piger (2005), they argue that inflation expectations are more anchored for targeters than for non-targeters particularly at longer horizons. Consequently the supporters of this view claim strongly that monetary policy has become more efficient under inflation targeting.

Calderon (2003) inflation targeting requires a forecast of inflation and an estimate of how inflation is likely to be affected by changes in monetary policy instruments. The pursuit of low inflation by means of any technique requires the same things, for example, the use of monetary targets has to be based on an assumption about the relationship between current monetary growth and future inflations and if the policy instrument is interest rates and future monetary growth.

Svensson (2007) a successful inflation targeting policy is characterized by

    i)   the announcement of the numerical inflation target
    ii)   an implementation of monetary policy that gives a major role to an inflation forecast
    iii)   an adoption of short term interest rates as the only monetary instrument and
    iv)   A high degree of transparence and accountability.

The Peoples Bank of China (PBOC) increased its benchmark lending and deposit rate for the second time this year as the government continues to battle against surging prices. The monetary policy committee with the (PBOC)said the rate hike was mainly aimed at managing inflationary expectations and reflected the policy shift as tightening the money supply is the best way to curb inflation. Besides interest rates hike China has also increased the bank reserve ratio six times in 2010 to 18.5 percent and 19 percent for some large commercial bank.

4. Objectives of the Study

The objectives of the study revolved around exploring the significance and the suitability of the monetary policy in realizing macroeconomic goals. Some of these macroeconomic objectives included price stability, economic growth, full employment, and a favorable balance of payment.

Specific Objectives

The specific objectives of the study are as outlined below:

✓ Establish the relationship between money supply and inflation.

✓ Find out the effectiveness of monetary policy in the combating of inflation.

✓ Find out the efficiency of the RBI in controlling the supply and availability of money.

✓ Find out whether monetary policy is well established to enable the safeguarding of the value of Indian currency.

✓ Identify if there exist any other viable policies that can be used to combat inflation.

4.1 Significance of the Study

The study will be useful to the government, the Reserve Bank of India, and other Stakeholders who are involved in the formulation of monetary policies. In addition, the research will come in

handy in helping in the management of both monetary and fiscal policies to enable better control of the economy. In this perspective, the research will aid in the elimination of the various operational lags that affect the implementation of monetary policy.

5. Model Specifications

The model used in this study is regression model and particularly multiple regression model as inflation rate is assumed to depend on a number of several variables which are; money supply, interest rates, and foreign exchange rates (`/USD)

$Z=b_0+b_1x+b_2j+b_3k+e$

Where

Z-represents the rate of inflation

b_0-this gives the inflation rate when all other variables are zero

X- Total money supply

J- Foreign exchange rate in USA dollars

K-the commercial banks interest rates

b_1- coefficient of money supply- It was used to measure how a unit change in money supply changes the inflation rate

b_2- coefficient of foreign exchange rate- It was used to measure how a unit change in foreign exchange affects the rate of inflation

b_3- coefficient of commercial banks interest rates – It was used to measure how a unit change in interest rates affects the rate of inflation.

e-the error term.

The rate of inflation (Z) is the dependent variable while money supply interest rates and foreign exchange are the independent variables

5.1 Definition and Measurement of Variables

Four variables were utilized in this research and they were; inflation rate, money supply, foreign exchange rates and commercial banks interest rates

Inflation is measured by a change in wholesale price index (WPI)

Commercial banks interest rates lending interest rates for India's commercial banks

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Money supply m3(broad money) is the money held by public in form of cash, current accounts, saving deposits plus small time fixed deposits.

Foreign exchange rate is the average annual prevailing foreign exchange rate between Indian Rupee and US dollars.

5.2 Data analysis

The inputted data was then presented in the form of tables. This provides for an easier analysis and interpretation of the data inputted. Further the data was then regressed to obtain t-values , p-values , specific coefficients and intercepts, standard errors among other values at given significance levels .These values will be used for further analysis.

5.3. Data Analysis and Presentation.

This chapter gives data analysis and presentation in tables enabling interpretation of the results. The results of the analysis were used in the making of conclusions and recommendations. The tables below represent the collected data. The following table shows the average annual rates of inflation in India from 2000-01 to 2013-14.

Year	2000 -01	2001 -02	2002 -03	2003 -04	2004 -05	2005 -06	2006 -07	2007 -08	2008 -09	2009 -10	2010 -11	2011 -12	2012 -13	2013 -14
Inflatio n rate	7.133	3.658	3.358	5.466	6.466	4.444	6.585	4.742	8.092	3.855	9.573	8.95	7.361	4.998

From the above table it's seen that inflation rate in India has been rising and falling at different times. It was lowest in 2002-03, then in the following year it rose to a rate of 5.4 then it gradually rose to 8.09 before falling to 3.85 in 2009-10. It was highest in 2010-11.

The following table shows money supply in India over the same period of time from 2000-01 to 2013-14. The money supply is in billions. This value has been converted to hundreds of billions for an easier analysis to make the data in the table have the same range.

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Money supply (100 billion)	122.4	142.0	164.79	186.15	212.82	245.89	295.01	360.34	434.36	517.78	601.51	696.71	790.75	975.38

Source: Reserve Bank of India.

From the above tables it's evident that there is a positive relationship between money supply and the rates of inflation. The rate of inflation rises or falls gradually as the amount of money supply increases or reduces. Though there are some areas that do not seem to follow this trend this can be attributed to other non-economic factors as political instability and the contagion of world economic crisis.

The following table shows the foreign exchange rates in India for a period of 14 years from 2000-01 and 2013-14.

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Foreign Exchange rate($\check{}$/$)	44.94	47.19	48.6	46.58	45.32	44.1	45.31	41.35	43.5	48.4	45.73	46.67	53.44	56.66

Source: Reserve Bank of India.

Foreign exchange year is between the Indian Rupees and the USA Dollar .USA dollar was preferred to other currencies as India usually conducts most of its foreign transactions(payment of its foreign debts, importation and exportation among others) using the dollar. Rising foreign exchange rate means that the Indian Rupee is depreciation against the dollar .This usually favors exportation and makes importation more expensive and since India is a major importer of oil products this usually has adverse effects on our economy. This leads to increased inflation. When the foreign exchange rate rises (domestic currency depreciates) the rate of inflation also rises and when it falls the rate of inflation also falls. This shows that there is a positive relationship between the rate of inflation and the foreign exchange rate.

The following table shows the rates commercial banks interests' rates for a period of 14 years from 2000-01 to 2013-14.

Year	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14
Interest Rates(%)	11.5	11.5	11.125	10.625	10.625	11.5	13.5	14	14.125	13.375	8.875	10.375	9.975	9.975

Source: Respective financial institutions and Reserve Bank of India.

From the above table, when commercial banks interest rates increases it decrease the rate of inflation. Though there are some mixed reactions at some points this could be attributed to the other factors that affect inflation including money supply, foreign exchange rates and other non-economic factor as political and social instability among others. Increase in interest rates is one of the most commonly used policies by the Reserve Bank of India to control inflation. This usually has a direct impact as commercial banks also increase their rates by the same or by a

higher margin. This is a contractionary policy as high interest rates discourage investors and this may have a negative impact on the growth of the economy.

The table below shows the rates of inflation, money supply, foreign exchange rates and commercial banks interest rates over the period of this study which is a 14 year period.

YEAR	INFLATION RATE(Z)	MONEY SUPPLY(X) (billions)	FOREIGN EXCHANGE RATES(J) (ˋ/$)	COMMERCIAL BANKS INTEREST RATES(K)(%)
2000-01	7.133	12240.92	44.94	11.5
2001-02	3.658	14200.07	47.19	11.5
2002-03	3.358	16479.54	48.6	11.125
2003-04	5.466	18615.80	46.58	10.625
2004-05	6.466	21282.27	45.32	10.625
2005-06	4.444	24589.25	44.1	11.5
2006-07	6.585	29501.86	45.31	13.5
2007-08	4.742	36034.44	41.35	14
2008-09	8.092	43436.64	43.5	14.125
2009-10	3.855	51778.82	48.4	13.375
2010-11	9.573	60151.65	45.73	8.875
2011-12	8.958	69671.39	46.67	10.375
2012-13	7.361	79075.58	53.44	9.975
2013-14	4.998	97538.48	56.66	9.975

Source: Reserve Bank of India.

6. Substantive Objectives

6.1 To establish the relationship between money supply and inflation.

The first objective was to establish whether there exist any relationship between money supply and inflation. The research analyzed money supply for a range of 14 years. From the analysis, it is clear that there exist a direct relationship between money supply and inflation. Movements or deviation in one variable reflect a change in the other.

6.2 To find out the effectiveness of monetary policy in combating inflation.

The second objective aimed at investigating the effectiveness of money supply in combating inflation. From the statistical analysis, money supply was found to be effective in combating money supply. A change in the levels of money supply has an impact on the level of inflation.

6.3 Data Analysis and Interpretation

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.75539
R Square	0.570615
Adjusted R Square	0.441799
Standard Error	1.493038
Observations	14

ANOVA

	df	SS	MS	F	Significance F
Regression	3	29.62355	9.874518	4.429699	0.03163
Residual	10	22.29162	2.229162		
Total	13	51.91517			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	32.91251	8.811801	3.735049	0.003878	13.27859	52.54642	13.27859	52.54642
money Supply	6.0238	2.052	2.935489	0.0149	1.4515	0.000106	1.4515	0.000106
Exchange Rate	-0.47175	0.153815	-3.06699	0.011902	-0.81447	-0.12903	-0.81447	-0.12903
Interest rate	-0.62319	0.29415	-2.1186	0.060165	-1.2786	0.032221	-1.2786	0.032221

The equation of this model then becomes;

$Z = 32.912 + 6.023X - 0.472J - 0.623K$

Interpretation of the Equation

$b_0 = 32.912$ - this is the rate of inflation when all other factors are zero. This means that there will be inflation rate of 32.912 when money supply, foreign exchange rate and commercial bank interest rates are zero.

$b_1 = 6.023$ coefficient of money supply .This means that inflation rate increases at a rate of 6.023 when money supply increases by 1 billion.

$b_2 = -0.4717$ coefficient of foreign exchange rate .This means that the rate of inflation decreases by 0.4717 when foreign exchange rates increases by one.

$b_3 = -0.623$ coefficient of commercial banks interest rates. This means that the rate of inflation decreases by 0.623 when commercial banks interest rates increases by one.

Interpretation of p- values

$X = 0.0149$ this means that money supply is significant at 5 percent significance level.

$J = 0.011902$ this means that foreign exchange rates are significant at 5 percent significance levels.

$K = 0.060165$ this means that commercial banks interest rates are significant at 10 percent significance levels.

Interpretation of regression statistics

Multiple R = 0.75539

This is the correlation coefficient, it means that there is a strong linear relationship between the rate of inflation and the factors affecting it that, money supply, foreign exchange rate and interest rates.

R square = 0.570615

This is the coefficient of determination. It means that 57 percent of the variations in inflation rate can be explained by variations in money supply, foreign exchange rates and commercial banks interest rates.

7. Summary

The broad objective of this study was to establish the effectiveness of monetary policy as a tool for combating inflation. The variables investigated were the level of inflation, commercial banks interest rates, money supply and the foreign exchange rate (measurable in dollars); from India. The research evolved from the continued inefficient use of monetary policies in India. The data collected was secondary in nature and a trend analysis carried out to investigate the effectiveness

of monetary policy in controlling the level of inflation. The ordinary least square method (regression analysis) was utilized in the analysis of the data collected. Regression analysis is a tool commonly utilized in the determining of the existence of a relationship between variables; using historical data.

In addition, descriptive statistics were utilized in the analysis of the data collected. The study carried out regression through the utilization of Microsoft Excel. From the study, it is evident that monetary policies have a role to play in the control of inflation. Thus, monetary policy, as a tool for controlling inflation, is effective.

8. Conclusion

From the analysis, money supply was found out to be most significant factor affecting the rate of inflation. When money supply increases by one billion the rate of inflation increases by 6.023.This being so, then it means that any increase in money supply should be managed to a level that allows the economy to grow and also high enough to avoid inflation (a situation where the prices are falling) This is due to the fact that, if money supply is zero and the other factors are also zero, there will be a inflation of 32.912. This means that the economy is growing hence affects the other objectives of macroeconomics. Also, it is evident that there exist a negative relationship between increase in foreign exchange rate and the rate of inflation; when the currency appreciates at a rate of one, inflation increases at a rate of 0.472. Therefore efforts should be made to avoid any appreciation in the domestic currency.

Also, this research showed that there exist a negative relationship between the rate of inflation and the commercial banks interest rates. When the commercial banks interest rates increase by one percent, the rate of inflation reduces by 0.623. Thus, increase in interest rates is one way of controlling the rate of inflation. However, the rates of interest should be managed at a level that does not hurt investments as high interest rates hinders investments and this leads to poor economic growth hence it adversely affects the other macroeconomic objectives.

Apart from the macroeconomic variables discussed above it is also evident other factors influence the rate of inflation. Some these factors include political instability, tribal clashes, international financial crisis (recession and depression) amongst others. Inflation targeting (where the monetary authorities set a certain target and manages the macroeconomic variables towards achieving that inflation rate) as policy should also be used as this has shown positive results in some parts of the world.

In a nutshell, it is worth noting that the monetary policy has been used successfully in many of the major world economies such as USA, China, and South Africa and among others to achieve price stability, increase employment level, promote economic growth and development and also to achieve positive balance of payments.

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