Measuring Relationship between Inflation and Monetary Policy Variables : An Analytical Study

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ARTICLE DETAILS	ABSTRACT
Research Paper	This research attempts to assess the relationship of inflation with selected monetary policy variables viz., Cash Reserve Ratio (CRR), Repo Rate (RR), and Reverse Repo Rate (RRR) over 15 years i.e. FY 2005-06 to 2019-20. For this study, information relating to movements in inflation, RR, RRR, and CRR have been collected from secondary sources viz., RBI annual reports, and other web sources. The data so gathered was tabulated and analysed using data classification tools and various statistical techniques have been applied including mean, standard deviation, and Pearson's Correlation, for testing the stated hypothesis. A positive and significant correlation exists between CRR and Inflation however, RR is found to have a low positive but non-significant correlation, and RRR has a moderate negative but non-significant relationship with inflation. The current study focuses on the relationship of inflation with selected monetary policy variables without considering the effect of other economic variables.
Keywords: *Inflation, monetary policy variables, cash reserve ratio, repo rate, reverse repo rate.*	

1. INTRODUCTION

India has observed substantial changes in its monetary policy framework during the last two decades. The RBI's decisions concerning monetary were governed by a 'multiple indicator approach' (MIA) from the early 2000s till 2015 (Dua, 2020). In India, monetary policy goals focused on achieving price stability and output growth, without setting specific quantitative targets. The RBI considered a range of macroeconomic factors in its deliberations. Until the early 2000s, the CRR was a primary tool for managing liquidity in the financial system. However, starting in 2000, there was a transition towards utilising the RR and the RRR as the central monetary policy instruments. Despite this shift, the CRR was adjusted periodically to manage liquidity until around 2012. In 2016, India formally practised inflation targeting (IT) as its monetary policy framework through amendments to the RBI Act of 1934. Under this new regime, the principal objective of India's monetary policy is price stability focusing on supporting output growth (Lakdawala & Sengupta, 2021). Thus, an attempt was made to examine the relationship of inflation with monetary policy variables viz., RR, RRR, and CRR over 15 years i.e. FY 2005-06 to 2019-20.

2. LITERATURE REVIEW

Salunkhe & Patnaik (2017) demonstrate a two-way causality of policy rate with both inflation and output. It indicates that India's monetary authorities are equally focused on inflation and output growth when setting policy. Additionally, attempts to reduce inflation can have an equal or greater impact on the output, potentially harming growth. Consistent with earlier studies in India, the findings reveal that the output gap influences inflation primarily in the short to medium term. Kangasabapathy (2001) provides a historical overview of India's monetary policy, highlighting its limitations and constraints while discussing the current economic perspectives amid a changing global environment. Recently, the RBI has shifted to using indirect instruments like Repo, Bank rate, and OMO, moving away from its previous reliance on CRR. Debates on monetary policy continue, especially regarding objectives, instruments, and impacts. The monetary management of the 1980s and 1990s in India, as discussed by Rangarajan (2001), offers insights into monetary policy as a tool of economic policy, emphasizing its role in achieving price stability.

Kaur et al. (2015) noted that since 2009, the RBI governor has prioritized price control by maintaining or increasing the repo rate despite government pressure to reduce it. He has justified these

increases as necessary to manage uncontrollable inflation. However, many theories and studies suggest that this approach may not be suitable for India. Regression results indicate a positive relationship between inflation and various economic variables, with Granger Causality results showing that inflation mainly affects the interest rate. This is consistent with theoretical expectations, although recent inflation patterns in India challenge the effectiveness of interest rates as a control variable, questioning the rationale behind increasing or maintaining high interest rates. Several researchers reported that monetary policy significantly influences output and inflation (Al-Mashat (2003), Aleem (2010), Mohanty (2012), and Khundrakpam (2012, 2013)). Tight monetary policy negatively affects growth and inflation, while loose monetary policy affects it positively. However, there is a delay in the impact of monetary policy on achieving its final objectives (Salunkhe & Patnaik, 2017).

3. RESEARCH OBJECTIVE

To investigate the relationship between selected monetary policy variables viz, CRR, RR, RRR and the Inflation rate.

4. HYPOTHESIS

H_{01}: Inflation does not relate significantly to Monetary Policy Variables (RR, RRR, and CRR).

5. DATA ANALYSIS

Data analysis was mainly based on the information collected from secondary sources viz., annual reports of RBI, and other web sources. The data so gathered was tabulated and analysed using data classification tools and interpretations were done to get the meaningful implications. Moreover, various statistical techniques have been applied including mean, standard deviation, and Pearson's Correlation, for testing the stated hypothesis.

Descriptive Analysis

The study variables include RR, RRR, CRR, and Inflation. Table 1 shows average annual movements along all the study variables during the period 2005-06 to 2019-20 followed by Table 2 which depicts descriptive statistics.

Table 1   Average Annual Movements of the Study Variables (RR, RRR, CRR, and Inflation)

F.Y.	RR	RRR	CRR	Inflation
2006	6.375	5.25	5	5.8
2007	7.25	5.88	5.625	6.37
2008	7.75	6	6.8125	8.35
2009	7.25	4.17	7.325	10.88
2010	4.875	3.38	5.625	11.99
2011	6	4.82	6	8.86
2012	7.9	6.9	5.125	9.31
2013	7.75	6.75	4.25	11.06
2014	7.625	6.63	4	6.65
2015	7.625	6.63	4	4.91
2016	7	6	4	4.95
2017	6.375	5.88	4	3.33
2018	6	5.88	4	3.95
2019	6.33	6.08	4	3.72
2020	5.34	5.06	3	6.62

Source: Compiled from Database on the Indian economy, www.rbi.org.in
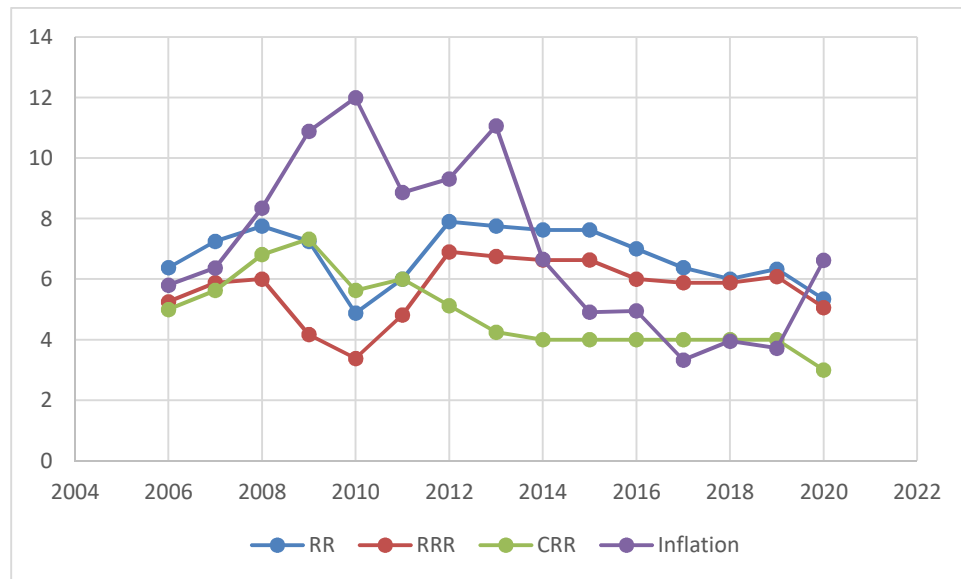

Figure 1: Monetary Policy Rates & Inflation in India: 2006-2020

Table 1 and the corresponding figure (Fig 1) depict the movements in RR, RRR, and CRR along with inflation based on the consumer price index (CPI) during 2005-06 through 2019-20.

Table 2   Descriptive Analysis of RR, RRR, CRR, and Inflation

Variables	N	Minimum	Maximum	Mean	Std. Deviation
RR	15	4.88	7.90	6.7630	0.94491
RRR	15	3.38	6.90	5.6873	0.99288
CRR	15	3.00	7.33	4.8508	1.21645
Inflation	15	3.33	11.99	7.1167	2.81649

Table 2 shows the mean and standard deviation values of the study variables over 15 years i.e. from 2005-06 to 2019-2020. The mean RR was found to be 6.76 with SD 0.94, the mean RRR was 5.69 with SD 0.99, and the mean CRR was 4.85 with SD 1.22. Further, mean inflation was 7.12 with SD 2.82.

Inferential Analysis

Relationship between Inflation and Monetary Policy Variables (RR, RRR, CRR)

Pearson's Correlation was applied to measure the relationship strength of Inflation with RR, RRR, and CRR.

Table 3 Correlation of Inflation with RR, RRR, and CRR

Pair		RR	RRR	CRR
Inflation	Pearson Correlation	0.062	-0.418	0.601
	P value	0.827	0.121	0.018
	N	15	15	15
Result		Non-Sig and Low	Non-Sig and moderate	Significant and

	Positive Correlation	Negative Correlation	Positive Correlation

Table 3 shows the correlation between Inflation and selected monetary policy variables viz., RR, RRR, and CRR. A non-significant and low positive correlation existed between Inflation and RR (r=0.062, p<0.05) indicating a weak correlation. Between Inflation and RRR, a non-significant but moderate negative correlation (r=-0.418, p<0.05) was found which shows a negative relationship between these two. Inflation and CRR were found to have a significant and positive correlation (r=0.601, p<0.05) which indicates that the higher the CRR higher the rate of inflation.

The analysis concludes that a significant and positive correlation exists between CRR and Inflation however, RR and RRR do not have such type of relationship with inflation thus, the null hypothesis gets rejected that Inflation does not relate significantly with CRR however, with RR and RRR the null hypothesis is true.

6. CONCLUSION

With the onset of reforms in the financial sector, India's monetary management has progressively shifted towards using indirect instruments such as fine-tuning liquidity conditions and open market operations via the Liquidity Adjustment Facility (LAF). Adjustments in policy interest rates have become the primary tool for signalling the stance of monetary policy (Sharma, 2015). The paper reveals that movements in CRR have a significant and positive relationship with inflation however, a non-significant relationship was found between inflation and RR, and RRR. Thus, the use of these variables (RR, RRR, and CRR) for combating inflation should be done. Formulating monetary policy is a technical exercise that has evolved to become more consultative and inclusive, involving market participants, academics, and experts in decision-making (Smitha, 2010).

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