

# Boom or bust? A Comparative Analysis of Monetary Policy and Stock Market Performance in India Across Economic Cycles

Khushi Mittal, Jitender Bhandari



**Abstract:** This study delves into the intricate relationship between monetary policy instruments and various sectors of the Indian stock market from 2011 to 2022. By analyzing data encompassing significant policy shifts and economic events, including the Reserve Bank of India's (RBI) transition towards inflation targeting and flexible exchange rates, the study aims to uncover the nuanced impacts of monetary policy on sectoral indices. Utilizing a Vector Autoregression (VAR) model, the study examines the dynamic interplay between key monetary policy instruments—Cash Reserve Ratio (CRR), Marginal Standing Facility Rate (MSF), Repo Rate, Reverse Repo Rate, and Treasury Bills—and ten diverse sectors represented in the Bombay Stock Exchange (BSE) indices. The findings reveal intricate sector-specific responses to monetary policy adjustments, reflecting the complex interplay of economic dynamics and policy measures. While some sectors exhibit positive correlations with certain monetary instruments, others display negative associations, underscoring the diverse impacts of monetary policy on sectoral performance. The study highlights the significance of understanding these nuanced relationships for policymakers, investors, and market participants in navigating India's evolving economic landscape.

**Keywords:** RBI, VAR, CRR, MSF, BSE

## I. INTRODUCTION

India's monetary policy, overseen by the Reserve Bank of India (RBI), plays a crucial role in navigating the intricate dance between economic growth and price stability. In the 1980s, a severe economic crisis forced India to seek assistance from the World Bank and IMF. This led to a policy shift in 1991, focusing on controlling inflation and curbing monetary expansion. The RBI utilizes various tools, including the Cash Reserve Ratio (CRR), Statutory Liquidity Ratio (SLR), repo rate, and reverse repo rate, to manage the money supply. These policy adjustments impact interest rates, influencing borrowing, production, imports, exports, and ultimately, the Gross Domestic Product (GDP). Interest rate cuts by the RBI can stimulate the stock market by making bank deposits less attractive, prompting investors to seek higher returns in equities.

Conversely, increasing the CRR can dampen investor enthusiasm by raising borrowing costs for businesses, potentially hindering production and impacting stock prices.

From 2011 to 2022, the Reserve Bank of India (RBI) conducted a complex symphony of policy adjustments, orchestrating the dance of key rates like the Cash Reserve Ratio (CRR), Marginal Standing Facility (MSF) rate, Reverse Repo rate, Repo rate, and Treasury Bill rates. Each instrument played a unique role in managing inflation, stimulating growth, and ensuring financial stability amidst ever-shifting economic landscapes. The opening act began with elevated rates to combat stubborn inflation. High CRR (6%) and Repo rate (8.5%) aimed to curb spending and cool the overheated economy. As inflation moderated, the RBI gradually lowered both rates and introduced the MSF rate at 8.5%, mirroring the elevated Repo rate. Seeking to revitalize growth, the RBI slashed rates. The CRR hit a record low of 3.25%, and the Repo rate dipped to 6%. However, global headwinds forced adjustments. Rising oil prices and capital outflows triggered CRR hikes and Repo rate increases to manage liquidity and inflation. The MSF rate also saw adjustments to maintain financial stability. The COVID-19 pandemic demanded a dramatic shift. The CRR and Repo rate plunged to historic lows (3% and 4%, respectively) to inject liquidity. The Reverse Repo rate, used to absorb excess liquidity, remained low to incentivize banks to lend. Treasury Bill rates also dipped, reflecting the reduced risk-free return. As the economy recovered, the RBI cautiously raised rates, aiming for a balanced performance between growth and stability.

The Indian stock market (Sensex) witnessed significant growth during this period, rising from 17,474 in 2011 to 58,433 in 2022, representing a compounded annual growth rate (CAGR) of approximately 11%. However, the growth wasn't uniform across all sectors. Some sectors outperformed the market, while others lagged. The Indian auto sector rode a rollercoaster from 2011 to 2022. Initial growth sputtered as economic headwinds and stricter regulations slammed the brakes. Despite the bumpy ride, passenger vehicles, especially SUVs, continued to cruise ahead, fueled by rising aspirations. However, two-wheelers hit a pothole, their momentum stalled by rising fuel costs and emission norms that tightened the screws. But a glimmer of hope emerged with electric vehicles, zooming onto the scene with government support as their tailwind.

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The Indian banking scene underwent a metamorphosis from 2011 to 2022. Mergers and acquisitions became the buzzword, reshaping the landscape. While public sector banks (PSU Banks) grappled with a mountain of bad loans, hindering their progress, private banks emerged as shining stars, their superior asset quality and management practices propelling them ahead. India's economy in the recent period has seen vibrant growth across several sectors. IT remained a powerhouse, fuelled by strong exports and domestic demand, further bolstered by opportunities in cloud, AI, and big data. However, talent acquisition and skill development pose ongoing challenges. The media landscape witnessed a digital revolution, with traditional players adapting to streaming, social media, and changing consumer preferences. The financial sector saw dynamism with new entrants, diversification, and regulatory changes impacting insurance, wealth management, and fintech. Metals danced to the tune of global prices and domestic demand, while government infrastructure projects provided some stability. Real estate boomed initially but faced a slowdown, with affordable housing remaining buoyant amidst reforms aimed at boosting transparency. The FMCG sector, driven by rising incomes, thrived on innovation, premiumization, and rural market focus, navigating increasing competition from new players and private labels. Finally, private banks outshone their PSU counterparts with better asset quality and management, catering to niche demands and emerging stronger through consolidation. This diverse picture highlights the dynamism and challenges of India's evolving economic landscape.

## II. LITERATURE REVIEW

The effects of monetary policy on stock markets have been a focal point of economic research, exploring how policy changes influence market volatility and sector-specific reactions. This literature review synthesizes key studies that analyze these relationships, positioning the contributions of Kunwar Sanjay Tomar and Subodh Kesharwani within the broader academic discourse.

Early foundational studies such as Bernanke and Kuttner (2005) have established that changes in monetary policy, specifically unexpected adjustments in the federal funds rate, can significantly influence stock prices. Their research, utilizing a Vector Autoregression (VAR) model, highlights the direct impact of policy changes on investor expectations and market valuations.

Building on this, Anamika Singh's (2020) analysis of 15 years of data delves into how policy rate changes influence market volatility in India. Singh's study underscores the importance of the Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) in controlling liquidity, which in turn affects the Index of Industrial Production (IIP). However, her findings suggest that the correlation between interest rates and NIFTY volatility is non-significant, a nuance that Tomar and Kesharwani aim to address through sectoral analysis.

Sector-specific responses to monetary policy are crucial for understanding the broader market dynamics. A. Edwin Prabu (2021) utilizes the identification through heteroskedasticity approach to explain the differential impacts of monetary policy announcements on various sectors. Prabu finds that sectors like realty and banking are significantly affected by

policy surprises, while sectors such as media and pharmaceuticals show minimal response, suggesting that sectoral characteristics significantly modulate policy effects.

Tomar and Kesharwani contribute to this sectoral discourse by employing a Nonlinear Autoregressive Distributed Lag (NARDL) model to analyze the asymmetric effects of monetary policy on 15 sectoral indices from May 2010 to December 2018. Their approach allows for capturing the nuanced, nonlinear relationships between monetary policy variables and sectoral stock indices, providing a detailed understanding of sector-specific sensitivities.

Methodological innovations have played a pivotal role in refining the analysis of monetary policy impacts. Shin, Yu, and Greenwood-Nimmo (2014) introduce the NARDL model to explore asymmetric effects, demonstrating that positive and negative policy shocks can have different magnitudes of impact on economic variables.

Tomar and Kesharwani (2022) adopt this advanced modelling technique, applying it alongside diagnostic tests such as the Breusch-Godfrey serial correlation LM test, heteroskedasticity test, Ramsey RESET test, and normality test to ensure robustness in their analysis. This methodological rigor addresses the aggregation bias present in traditional linear models and enhances the precision of their findings. Tomar and Kesharwani's study aligns with this evolving framework by focusing on the post-2010 period, reflecting the contemporary monetary policy environment and its implications for sectoral stock indices. Inflation announcements and their market impacts have been extensively studied to understand market efficiency.

Methodological innovations have played a pivotal role in refining the analysis of monetary policy impacts. Shin, Yu, and Greenwood-Nimmo (2014) introduce the NARDL model to explore asymmetric effects, demonstrating that positive and negative policy shocks can have different magnitudes of impact on economic variables. The evolution of India's monetary policy framework is another significant area of study. Pami Dua (2021) provides a comprehensive review of India's shift to inflation targeting with the establishment of the Monetary Policy Committee (MPC) in 2016. Dua discusses the adoption of a 4% CPI inflation target with a 2% tolerance band, emphasizing the role of unconventional monetary policies during economic downturns, such as the COVID-19 pandemic.

## III. DATA AND METHODOLOGY

The period from April 2011 to March 2022 was chosen for the study because it encompasses a significant shift in the monetary policy of the Reserve Bank of India (RBI) as well as several major events that impacted the Indian economy. The RBI's policy shift involved a move towards more inflation targeting and flexible exchange rates. The chosen timeframe captures key economic events in India, such as the inflationary pressures of 2011, the political shift following the 2014 elections, the disruptive impact of demonetization in 2016, and the ongoing challenges posed by the COVID-19 pandemic since 2020.



Data used: The Independent variable for this study analyses the impact of five monetary policy instruments from the Reserve Bank of India: Cash Reserve Ratio, Marginal Standing Facility Rate, Repo Rate, Reverse Repo Rate, and Treasury Bills.

To capture the Indian stock market's performance, this study utilizes 10 sectors from the Bombay Stock Exchange (BSE) indices. While the BSE offers 20 industry-specific indices, data limitations restrict our analysis to sectors with complete data coverage for the chosen period (2010 onwards). These sectors encompass diverse industries like Auto, Banking (including PSU and Private Banks), Information Technology, Media, Financial Services, Metals, Real Estate, and Fast-Moving Consumer Goods (FMCG). This selection ensures a comprehensive representation of the Indian market's various facets.

We utilized the augmented Dickey-Fuller (ADF) test to assess the stationarity of the data, followed by a VAR model analysis to uncover the relationship between the stock market and monetary policy.

#### IV. RESULT & DISCUSSION

The result shows most of the variables are nonstationary except CRR. Apart from it mostly are stationary Either at ADF (0) OR ADF (1) but not at ADF (2). (Table 1)

After converting our data into stationary, we have the VAR equation followed by the respective ADF test for each stock market Index.

$$D(AUTO) = C(8)*D(AUTO\_CLOSE(-8)) + C(16)*CRR\_(-8) + C(24)*D(MSF\_(-8)) + C(32)*D(REPO\_RATE\_(-8)) + C(40)*D(REVERSE\_REPO\_RATE\_(-8)) + C(48)*D(TREASURY\_BILL\_(-8)) + C(49)$$

$$D(BANK) = C(5)*D(BANK\_CLOSE(-5)) + C(10)*CRR\_(-5) + C(15)*MSF\_(-5) + C(20)*D(REPO\_RATE\_(-5)) + C(25)*D(REVERSE\_REPO\_RATE\_(-5)) + C(30)*D(TREASURY\_BILL\_(-5)) + C(31)$$

$$PSU\ Bank = C(3)*PSU\ BANK\_CLOSE(-3) + C(6)*CRR\_(-3) + C(9)*MSF\_(-3) + C(12)*D(REPO\_RATE\_(-3)) + C(15)*D(REVERSE\_REPO\_RATE\_(-3)) + C(18)*D(TREASURY\_BILL\_(-3)) + C(19)$$

$$D(IT) = C(3)*D(IT\_CLOSE(-3)) + C(6)*CRR\_(-3) + C(9)*MSF\_(-3) + C(12)*D(REPO\_RATE\_(-3)) + C(15)*D(REVERSE\_REPO\_RATE\_(-3)) + C(18)*D(TREASURY\_BILL\_(-3)) + C(19)$$

$$D(MEDIA) = C(5)*D(MEDIA\_CLOSE(-5)) + C(10)*CRR\_(-5) + C(15)*D(MSF\_(-5)) + C(20)*D(REPO\_RATE\_(-5)) + C(25)*D(REVERSE\_REPO\_RATE\_(-5)) + C(30)*D(TREASURY\_BILL\_(-5)) + C(31)$$

$$D(FINANCIAL\ SERVICE) = C(5)*D(FINANCIAL\ SERVICE\_CLOSE\_(-5)) + C(10)*CRR\_(-5) + C(15)*D(MSF\_(-5)) + C(20)*D(REPO\_RATE\_(-5))$$

$$+ C(25)*D(REVERSE\_REPO\_RATE\_(-5)) + C(30)*D(TREASURY\_BILL\_(-5)) + C(31)$$

$$D(METAL) = C(5)*D(METAL\_CLOSE(-5)) + C(10)*CRR\_(-5) + C(15)*D(MSF\_(-5)) + C(20)*D(REPO\_RATE\_(-5)) + C(25)*D(REVERSE\_REPO\_RATE\_(-5)) + C(30)*D(TREASURY\_BILL\_(-5)) + C(31)$$

$$D(REALITY) = C(5)*D(REALITY\_CLOSE\_(-5)) + C(10)*CRR\_(-5) + C(15)*MSF\_(-5) + C(20)*D(REPO\_RATE\_(-5)) + C(25)*D(REVERSE\_REPO\_RATE\_(-5)) + C(30)*D(TREASURY\_BILL\_(-5)) + C(31)$$

$$D(FMGC) = C(5)*D(FMGC\_CLOSE(-5)) + C(10)*CRR\_(-5) + C(15)*MSF\_(-5) + C(20)*D(REPO\_RATE\_(-5)) + C(25)*D(REVERSE\_REPO\_RATE\_(-5)) + C(30)*D(TREASURY\_BILL\_(-5)) + C(31)$$

$$D(PRIVATE\ BANK) = C(8)*D(PRIVATE\ BANK\_CLOSE(-8)) + C(16)*CRR\_(-8) + C(24)*MSF\_(-8) + C(32)*D(REPO\_RATE\_(-8)) + C(40)*D(REVERSE\_REPO\_RATE\_(-8)) + C(48)*D(TREASURY\_BILL\_(-8)) + C(49)$$

Each equation shows the lag model that implies the most significant value in the data. The equation to predict the Auto sector index using the monetary variables can hence be used from the Table 2 below:

**A. Auto Sector Index = (-0.8856) CRR + (-0.243715) MSF + 0.539313 Repo Rate + (-0.86207) Reverse Repo Rate + 0.415074 Treasury Bill**

In the above equation, for each unit increase in the Repo rate, the Auto sector index will increase by 0.53%. At the same time, CRR, MSF, and reverse Repo Rate are inversely related but with a more robust coefficient. On the other hand, treasury bill is positively related to the Auto Sector Index. The reasons are as follows:

- In 2011, Global financial crisis recovery masked the negative impact of a repo rate increase due to increased risk appetite and investments in the auto sector.
- In 2013, RBI raised CRR to combat inflation, coinciding with a slowdown in auto sector growth.
- In 2014-2016, A period of economic slowdown might have led investors to seek safer havens like treasury bills, temporarily pushing up their yields and the auto sector index due to the reasons.
- In 2016, demonetization disrupted economic activity amplifying the negative impact of higher CRR and MSF rates on auto sales.
- In 2020, COVID-19 significantly impacted supply chains and consumer spending, exacerbating the effect of increased reverse repo rates on the auto sector.

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While the relationship between financial instruments and various sectors in India during 2011-2022 can be complex, some general trends emerge. The Bank sector, for instance, exhibited a positive correlation with the reverse repo rate despite an initial negative impact due to reduced liquidity. This seemingly paradoxical relationship can be explained by the delayed positive effect on investor confidence and financial stability that the reverse repo rate's influence on liquidity management ultimately had. Conversely, PSU banks saw a negative association with the repo rate. Higher borrowing costs associated with rising repo rates likely put a strain on loan demand and profitability for these banks, outweighing any potential benefits from treasury bill yields. Similarly, the IT sector experienced a negative relationship with treasury bills.

This can be attributed to investor behavior, where periods of economic uncertainty or rising interest rates incentivize them to shift funds from riskier assets like IT stocks to safer havens like treasury bills, impacting the sector's performance. Events like the 2013 taper tantrum and global economic slowdowns might have exacerbated this effect.

On the other hand, both the media and financial sectors witnessed a positive correlation with both MSF and reverse repo rates. This is likely due to the increased liquidity these instruments inject into the system, which can boost advertising spending for media companies and foster investor confidence in the financial sector's stability. This positive association might have been particularly evident during specific events like the post-crisis recovery period (2011-2012) and periods of liquidity tightening measures (2018-2019).

While the positive relationship between the metal sector and the reverse repo rate initially seems puzzling, several factors may explain it. Firstly, increased liquidity injected by the reverse repo rate might have stimulated industrial activity, leading to higher demand for metals. Secondly, metals can act as safe havens during economic uncertainty, like the 2013 taper tantrum, attracting investments even when interest rates rise. Finally, specific events like infrastructure development projects in India could have driven metal demand, further outweighing any negative effects of higher interest rates. Similarly, the FMCG sector's positive association with the MSF and reverse repo rate during 2011-2022 can be attributed to two key factors. Firstly, increased liquidity from these instruments might have fuelled consumer spending, potentially offsetting any negative impact from higher interest rates. Secondly, the defensive nature of the FMCG sector likely attracted investor confidence during uncertain times. Events like the 2013-rupee depreciation or global economic slowdowns might have further strengthened this dynamic by highlighting the sector's relative stability.

The positive relationship between the realty sector and the CRR in 2011-2022 requires a more nuanced approach, as it seems counterintuitive at first glance. One possible explanation lies in government initiatives or specific segments within the sector, like affordable housing, benefiting from increased liquidity due to lower CRR. This advantage could have potentially outweighed the negative impact of higher borrowing costs for some players in the realty sector. However, it's important to note that further analysis considering specific data and policy changes would be crucial to fully understand this seemingly paradoxical relationship.

Test	ADF(0)	Stock Market Indices									
		Auto	Bank	PSU Bank	IT	Media	Financial Services	Metal	FMGC	Realty	Private Bank
Monetary Policy	ADF(1)	0.00	0.00	0.0339	0.00	0.0001	0.00	0.00	0.00	0.00	0.00
	CRR	0.0010	0.0101	0.0114	0.0205	0.0004	0.0001	0.0011	0.0114	0.0114	0.0001
	MSF	ADF(0)									
	ADF(1)	0.00	0.0047	0.0044	0.0104	0.00	0.0001	0.00	0.0046	0.0046	0.00
	Repo Rate	ADF(0)									
	ADF(1)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
	Reverse Repo Rate	ADF(0)									
	ADF(1)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
	Treasury Bill	ADF(0)									
	ADF(1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Test	Stock Market Indices										
	Auto	Bank	PSU Bank	IT	Media	Financial Services	Metal	FMGC	Realty	Private Bank	
CRR	-0.8856	-0.054775	0.061472	0.1425	-0.226969	-0.039845	-1.088136	-1.229155	0.075618	-1.0123	
MSF	-0.243715	-1.831915	1.279002	0.331396	0.575973	0.178056	-0.564273	0.801353	-0.393972	-0.84	
Repo Rate	0.539313	-1.16847	-0.117784	0.141462	-0.389447	-1.83203	-0.337267	0.032846	-0.522681	0.221624	
Reverse Repo Rate	-0.86207	1.01276	0.787184	0.022268	0.328308	1.619177	0.07488	-0.160105	-0.038521	-0.648758	
Treasury Bill	0.415074	-0.010158	0.081256	-0.341091	-0.39739	-0.136257	-1.35825	-1.219553	-0.472679	-0.893017	

## V. CONCLUSION & POLICY IMPLICATION

To conclude we have seen all the variables were nonstationary except CRR. While the Auto sector exhibited sensitivity to Repo rates and liquidity measures, other sectors like Banking and Media displayed more complex dynamics based on factors like investor confidence, economic uncertainty, and specific government initiatives. These intricate relationships highlight the need for nuanced analysis that considers not just immediate impacts but also delayed effects, investor behaviour, and specific events or policy changes. The policymaker can use the VAR model to know the relationship between monetary policy and the Indian stock market. E.g.: for each unit increase in the MSF, the Metal sector index will increase by 0.57%. The IT and PSU Bank sectors are most affected by monetary policy decisions.

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