Impact of Interest Rates on Stock Market Volatility in India: An Empirical Analysis

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Abstract

Research study focuses on how variations in interest rate cause volatility in Indian stock markets and how it affects stock performance. By using secondary data from 2013 to 2023, the study analyses the impact of interest rates (Repo Rate, Reverse Repo Rate) on the stock market indices (BSE Sensex, NSE Nifty) through methods such as correlation analysis, regression models, and volatility modelling (GARCH). Additionally, it assesses the impact of external economic variables, such as inflation and global market trends, in moderating this relationship. Data from a comprehensive historical analysis reveals that interest rates exhibit a strong inverse correlation with market returns, indicating that rates influence market tonality and volatility, especially in an inflationary economy. In summary, the research finds that interest rate policy supports stock market stability, which has important implications for investors and policy makers. It advises to implement a balanced monetary policy to mitigate volatility and investor sentiment and also take into account external economic factors for policy decisions.

Keywords: Rate of Interest, Stock market, volatility, correlation, etc.

1.1 Introduction:

Even though the connection between interest rates and stock market volatility has received a lot of scholarly attention, particularly in emerging economies, this study emphasises on India as the country of interest. Interest rates, which are regulated by the Reserve Bank of India (RBI), have a big effect on the Indian economy as a whole. They affect consumer spending, company investment, and the liquidity of the financial system. Changes in interest rates cause notable swings in market activity and investor mood, which have an effect on the stock price, the number of shares traded, and other elements of the market overall.

With an increasing number of ordinary investors and foreign institutional inflows, the Indian stock market is extremely susceptible to changes in monetary policy. Businesses and individuals pay a new cost for borrowing money when interest rates rise or fall, which has an impact on stock market performance, corporate profitability, and demand for products and services. For instance, a rise in interest rates often signals a tighter monetary policy that may reduce business profits and depress the value of equities. On the other hand, lower interest rates can boost stock market performance and foster business-friendly environments.

This study aims to investigate experimentally the connection between interest rate fluctuations and Indian stock market volatility. Through data analysis, the study aims to ascertain if monetary policy changes raise financial market volatility and to what extent other factors—such as global economic conditions, inflationary pressure, and investor sentiment—mediate this relationship. Using regression analysis and historical data, this study attempts to investigate how interest rate changes affect the Indian stock market's volatility, which is important for risk management for investors and regulators as well as for developing economic strategies.

1.2 Objectives:

- To examine the effects of interest rate changes and how they relate to changes in the Indian stock market.
- To examine how the link between interest rates and stock market volatility in India is influenced by external economic factors such as inflation and global market trends, and to ascertain how these factors mitigate the effects of interest rate fluctuations.

2. Review of Literature:

There are several theoretical and empirical perspectives on the well-established relationship between prime rates and stock exchange volatility in financial economics. Interest Rates: A crucial component of monetary policy, interest rates have the ability to affect the cost of financial assets. Changes in interest rates have an effect on the present value of anticipated

future cash flows under the traditional asset pricing model, which in turn influences stock prices and market volatility (Fama, 1981).

Included empirical research have demonstrated how interest rate trends may exacerbate volatility by generating uncertainty in the financial markets. According to Chen, Roll, and Ross (1986), interest rates and other macroeconomic factors have a big influence on stock returns, suggesting that sudden changes in these factors might cause volatility. Similarly, Schwert (1989) discovered a favourable correlation between stock market volatility and macroeconomic volatility, namely that which was influenced by changes in monetary policy.

This connection has also been supported by research conducted in India. Bhattacharya and Mukherjee (2002) investigated the link between stock prices and macroeconomic factors in the Indian context and came to the conclusion that interest rates have a major impact on stock market behaviour. Additionally, Gan et al. (2006) discovered a strong correlation between interest rates and stock market performance, particularly in emerging nations, indicating that monetary policy tools have a big influence on stock movement.

Furthermore, according to Ahmad, Rehman, and Raoof (2010), depending on investor expectations and the overall status of the economy, changes in interest rates might either render the market stable or unstable. These results imply that excessive volatility may actually be more caused by interest rate variations in nations like India, where the market is extremely sensitive to policy pronouncements.

The exercise is limited to stock volatility in the Indian economy, despite some evidence from other countries that interest rate changes have an impact on stock volatility. It also lays the groundwork for empirical research to ascertain the degree and direction of the impact of interest rate changes on stock market volatility.

3. Methodology:

The volatility of the Indian stock market in relation to interest rates was examined using a descriptive analytical method. For the study's secondary data investigation, we relied on historical time-series data of the key interest rates as well as stock market indices including the Nifty.

In order to identify pertinent financial indicators and particular times when monetary policy changes were noteworthy, a purposive sample technique was used. The link was examined and the impact of interest rate changes on stock market volatility was quantified. Therefore, using the Indian data, the approach was developed to provide an empirical justification for the suggested link or lack thereof between interest rates and market activity.

4. Data Analysis:

It included trendwise monthly historical data for the annual key interest rates and trendwise annual data for the stock market indices (BSE Sensex, NSE Nifty) during a ten-year period. In order to examine the patterns and fluctuations in interest rate and stock returns, descriptive statistics were first computed. To ascertain the direction and degree of the link between interest rate fluctuations and stock market volatility, correlation analysis must be performed. Using interest rate variation as the main independent variable and stock market volatility as the dependent variable, multiple regression analysis was employed to gain a deeper understanding of this relationship.

Table 1 Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Repo Rate (%)	5.87	1.38	4.00	8.00
Reverse Repo Rate (%)	5.42	1.27	3.35	7.00
NSE Nifty Returns (%)	0.96	5.85	-23.20	14.25
BSE Sensex Returns (%)	1.02	6.03	-22.45	15.30
Inflation Rate (CPI) (%)	5.23	1.56	2.86	9.10
Crude Oil Price (USD)	64.20	18.40	27.89	98.25

An summary of the data is given in this table. Considerable volatility is shown by the standard deviation of stock returns. Changes in monetary policy are reflected in the fluctuation in repo and reverse repo rates over the course of the decade. Significant swings in inflation and crude oil prices also suggested outside economic forces.

Table 2 Correlation Matrix

Variables	Interest Rates	Nifty Returns	Sensex Returns	Inflation	Crude Oil
Interest Rates	1	-0.48	-0.45	0.34	-0.20
Nifty Returns	-0.48	1	0.96	-0.38	0.25
Sensex Returns	-0.45	0.96	1	-0.40	0.22
Inflation	0.34	-0.38	-0.40	1	0.15
Crude Oil	-0.20	0.25	0.22	0.15	1

There is an inverse link between interest rates and market returns, as seen by the negative correlation between interest rates and stock market returns. Trends in the market are validated by the strong positive connection between Sensex and Nifty returns. Crude oil prices and inflation have a less but still substantial correlation with other factors, indicating that they have a less pronounced impact on market behaviour.

Table 3 Regression Analysis

Independent Variables	Coefficient (β)	t-Statistic	p-Value
Repo Rate	0.82	3.21	0.002
Inflation Rate	0.45	2.75	0.008
Crude Oil Price	0.11	1.02	0.309
Global Index Returns	-0.36	-2.10	0.039
$R^2 = 0.62$			

According to the regression research, India's stock market volatility is greatly increased by the repo rate and inflation rate. This implies that market uncertainty is increased by growing inflation and interest rates. A statistically insignificant correlation between the price of crude oil and worldwide indices was found, suggesting that there may be a small chance of global spillover effects. Table 1 presents the fitted regression's summary statistics, which show that the model fits the data rather well, explaining around 62% (R2 = 0.62) of the variation in stock market volatility.

5. Conclusion

The current study's goals were to determine the causal link between interest rates and stock market volatility and to examine the effects of monetary policy changes and outside economic factors on the behaviour of the Indian stock market. The data show that higher interest rates have the opposite effect, leading to negative investment sentiment and increased market volatility, both of which have a major impact on stock market return. The Reserve Bank of India's (RBI) adjustments to the Repo and Reverse Repo Rates demonstrate how sensitive the Indian equities markets are to domestic monetary policy decisions.

The stability of the Indian stock market is significantly impacted by interest rate policy, as this study empirically shows. Investors, legislators, and market analysts need to keep an eye on shifts in interest rates and macroeconomic factors in order to make well-informed business choices. The paper highlights that monetary policy frameworks need to be more open and predictable in order to preserve market confidence and reduce volatility. Even though this kind of research is challenging, it might be extended in the future by employing higher frequency

data and/or sector-by-sector analysis to gain a deeper understanding of investor behaviour and market microstructure in relation to interest rates.

6. Recommendations:

This work is important because it helps Indian policymakers think about how changes in monetary policy can affect the dynamics of the stock market. In actuality, a balanced monetary policy that aims to stabilise interest rates can reduce sharp market swings and boost investor confidence. Therefore, rather than boosting demand, the fiscal and monetary policies should focus on reducing inflation as it has a significant impact on stock market performance. Investors are also encouraged to be more cautious when forecasting the market, taking into account both external economic factors like oil pricing and global market movements as well as local policies like interest rates. Finally, to further inform sectoral suggestions for Indian economy segments to best reduce risk, future research can concentrate on the sector-wise impact of interest rate fluctuations.

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