

Macroeconomic Indicators and Volatility in Banking Sector

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Abstract: *The dynamic relationship between macroeconomic factors in India and the stock returns of the NSE Nifty Bank index is examined in this study. The banking sector plays a preliminary role in monetary policy for economic stability which is sensitive to the macroeconomic fluctuations. This research employs time series data from January 2020 to December 2024, to analyse the Nifty Bank Index returns against select macroeconomic factors. The variables include the inflation rate, interest rates, exchange rates and GDP. The methodology uses econometric techniques such as Unit Root tests to check for stationarity, Ordinary Least Square regression model to check the positive negative effect. The empirical findings reveals that the NSE Nifty bank stock returns to macroeconomic highlights the economic policy. It emphasizes the need for adding these factors into the bank stock returns and offers values for investors to invest in the market.*

Keywords: NSE Nifty Bank Stock Returns, Inflation, Interest Rate, Exchange Rate, GDP.

I. INTRODUCTION

The Indian banking industry is a key component of the country's economic structure, serving as both an essential source of funding for expansion and development and the main channel for the transmission of monetary policy. In addition to this, banking stock performance and valuation are fundamentally influenced by the macroeconomic environment. Bank Stock returns, investor sentiment, and profitability can all be significantly influenced by changes in important economic indicators. A benchmark made up of the most liquid and capitalised Indian Banking firms, the NSE Nifty Bank Index provides an accurate indicator of the general health and performance of the important industry. Macroeconomic factors like inflation, interest rates, exchange rates and GDP growth create an intricate web of forces that may improve or harm bank profitability. For example, changes in interest rates have a direct impact on banks net interest margins, inflation reduces real investment returns and influences the banks policy, exchange rates affect the value of assets and liabilities and GDP growth determines the demand for credit and the health of borrowers. Understanding the dynamic relationship between macroeconomic variables and Nifty Bank returns is a practical necessity for investors, policymakers, and portfolio managers. This research seeks to examine the dynamic relation between the variables and it aims to quantify the impact of these economic forces. Further it emphasizes the necessity for investors and financial analysts to integrate these macroeconomic factors into their investment models. This research offers significant value for understanding the complex interactions between the financial markets and the economy as well as for making well informed investment decisions by offering evidence-based insights.

II. REVIEW OF LITERATURE

Diehold & Yilmaz (2008) examine the relationship between macroeconomic variables and stock returns fluctuation of African and Asian emerging markets. The findings reveal a positive correlation between stock returns, GDP and consumption. On the contrary, Choo, Lee & Ung (2011) investigate macroeconomic uncertainty and performance of GARCH models in forecasting Japan stock market volatility. The result reveals that macroeconomic variables have no impact on the volatility of Japanese stock markets.

Bekaert and Harvey (1997) studied the market forces that cause capital market to fluctuate in different countries of varied economies. They found that markets which are fully integrated are affected by international macroeconomic



fundamentals at several times and periods whereas markets which are segmented and operate at local levels are merely affected by local market forces. These market forces cause the variance in stock returns and a volatile condition is emerged. By analyzing the sources of variability in volatility separately; their study highlights how each capital market operated at local level is affected by world capital markets and how it influence changes with the passage of time.

III. STATEMENT OF THE PROBLEM

The NSE Nifty Bank Index, which represents the Indian banking industry is a key pillar of the country's economy, supporting economic growth, capital allocation and the transmission of monetary policy. Its performance and the macroeconomic situation at large are forever connected. Certain form, direction and magnitude of the influence of important macroeconomic factors on bank stock returns however are still unknown and need further empirical research. The impact of changes in indices such as GDP growth, interest rates, inflation and exchange rates on the valuation and returns of banking stocks is frequently not sufficiently recognised by investors, portfolio managers, and policy makers. Overpriced assets, inadequate investing methods, and possible systematic risks that could have been avoided are all results. The lack of a thorough investigation modelling the relationship between these macroeconomic determinants and the returns of the Nifty Bank Index. Major monetary policy changes and economic reforms represent a serious issue. By examining this dynamic the study aims to solve the issue and offer empirical data that can improve risk management procedures, investment decision making and informed policymaking.

IV. OBJECTIVE OF THE STUDY

To analyse the impact of macroeconomic indicators on NSE Nifty Bank Index.

V. HYPOTHESIS

- H01: Inflation has a significant effect on the NSE Nifty Bank Index.
H02: Interest rate has a significant effect on the NSE Nifty Bank Index.
H03: Exchange rate has significant effect on the NSE Nifty Bank Index.
H04: GDP has significant effect on the NSE Nifty Bank Index.

VI. METHODOLOGY

Research Design

The research employs a quantitative research design using time series data. The approach is explanatory in nature, aiming to explain the relationship and measure the degree to which macroeconomic variables impact the NSE Nifty Bank Index returns. The study covers the period from January 2020 to December 2024. (Monthly Data).

Table 1. Variables

Dependent Variable	Independent Variable
NSE Nifty Bank Index	Inflation Rate Interest Rate Exchange Rate GDP

Tools used

- Descriptive Statistics
- Stationarity Testing (Augmented Dickey Fuller Test)
- Regression Analysis (Ordinary Least Squares)

VII. DATA ANALYSIS AND FINDINGS

The factors influencing bank stock returns were examined using a pooled Ordinary Least Squares regression. The diagnostic tests were carried out to guarantee the result of robustness. The data were determined to be normally



distributed, and the reliability of the model was confirmed by the results of the test multicollinearity, serial correlation and heteroskedasticity all the results produced are acceptable.

Table 2. Variance Inflation Factor

Variable	VIF
Stock Return	2.00
Inflation Rate	2.02
Interest Rate	2.75
Exchange Rate	1.10
GDP	1.02

Table 3. Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Min	Max
Stock Return	1.020	1.010	0.202	0.371	2.246
Inflation Rate	4.933	4.922	0.135	4.680	5.175
Interest Rate	1.980	1.995	0.107	1.776	2.175
Exchange Rate	4.232	4.223	0.088	4.089	4.416
GDP	0.440	0.485	0.890	-2.284	3.116

Table 3 shows the descriptive statistics of the variables in the study. The average return is 102 and the median 1.01 is close to the mean indicating a symmetrical distribution. The standard deviation of 0.202 indicates moderate variability, with returns varying between 0.371 to 2.246. The Interest rate has a mean of 1.98, median of 1.995 and standard deviation of 0.107. The median value of Exchange rate is 4.223 which is relatively close to the mean 4.232 and the standard deviation is 0.088 indicating minimal variability in the data. The average GDP and Inflation are 0.440 and 4.933. So these are the observation from the year 2015 to 2024.

Table 4 Stationarity Test using ADF

Dependent Variables	Independent Variables	Level		1 st Difference		2 nd Difference	
		t-Statistics	Probability	t-Statistics	Probability	t-Statistics	Probability
NSE Nifty Bank Index Stock Return	Inflation Rate	0.918	0.995	-10.678	0.000	-	-
	Interest Rate	0.081	0.963	-11.546	0.000	-	-
	Exchange Rate	0.013	0.957	-11.239	0.000	-	-
	GDP	0.215	0.972	-10.674	0.000	-	-

Table 4 reveals the results of the unit root test applied to determine the order of integration among the time series data. The Augmented Dickey Fuller test was used at level, First difference and Second difference under assumption of constant. According to results of the test all macroeconomic indicators contain unit root test at level which indicated that these time series were not stationary on level, but it became stationary when its first difference was taken. Therefore, all the indicators prices are stationary on first difference, that is the degree of integration appears as $I(1)$.

Table 5. Regression results showing the impact of macroeconomic indicators on NSE Nifty Bank Index

Variable	Coefficient	Std. Error	t-stat
Inflation Rate	0.1644	0.0440	3.73***
Interest Rate	0.3069	0.0498	6.16***
Exchange Rate	-0.7440	0.1157	-6.43***
GDP	0.1928	0.0300	6.42***
Constant	-0.0252	0.0395	-0.64
F Statistic	25.83		
Prob(F-statistic)	0.000		

Note: ***represents the significance level at 1%.



Table 5 shows the regression results analysing the impact of macroeconomic indicators on bank stock returns. The results show that the interest rate exerts a significant positive effect on bank stock return 1 % increase in interest rate increases by returns by 30.69%, significant at the 1% level. The finding supports the alternative hypothesis that interest rate has a significant effect on NSE Nifty bank index. The exchange rate coefficient of -0.7440 indicates that increase in exchange rate would lead to a reduction in NSE Nifty bank index with a 1% significance level, thereby accepting the hypothesis. GDP and inflation rates show 0.1928 and 0.1644 reveals a positive effect in NSE Nifty bank index both significant at the 1% level. 1% increase in GDP leads to a 19.28% rise in bank stock return, reflecting the broader economic growth the improves the banking activities and profitability.

VIII. SUGGESTIONS

- One of the most important components of monetary policy intended to guide the stock market should be inflation targeting. Over time, the stock market should rise sharply if the economy inflation can be controlled.
- In maintaining the nations inflationary trend, investors may assess how stock values are acting. When the economy is expanding and prices are rising, they want to be more active in the market.
- Specifically, investors who buy during a recession and sell during a boom will optimise their returns. The economy's stock market stabilisation is further to be strengthened.

IX. CONCLUSION

The study aimed to analyse the impact of macroeconomic indicators on NSE Nifty Bank Index. The findings show the interest rate, inflation and GDP have significant positive effect whereas the exchange rate shows a negative impact. The influence of macroeconomic factors on bank stock returns shows the importance for investors to consider these factors while making investment decisions, portfolio, risk assessment techniques. However, the bank should adopt risk management practices, and maintaining sufficient capital reserves. Additionally, how well the banks manage market risks, bank stock performance during macroeconomic changes offers valuable insights for improving banking laws and health evaluations. When establishing policies focused on reducing financial risks, stabilising financial markets and enhancing the banking industry and larger financial infrastructure during economic trends.

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