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Impact of Interest Rates on the Performance of Banking Stock Indices

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Abstract

With consumer prices hitting high, global energy costs edging ever higher, and global unrest, it becomes clear inflation is not transitory. The Government always seeks to control inflation by influencing interest rates. Increasing the interest rates are aimed at reducing demand in the economy. Conversely, though, companies and consumers will both reduce their spending, which will result in lower earnings and falling stock prices. Furthermore, there are variations in the correlation and influence between interest rates and bank stock values throughout time. The purpose of this study is to look into how interest rates affect both Bank Private Nifty Index and the Bank PSU Nifty Index. The study's reference period spans April 2019 through March 2023. The Granger Causality test and the Johansen co-integration rank test, respectively, were used to analyze the study's both immediate and long run analyses. According to the study's findings, interest rates & bank stock index returns have a substantial long-term link.

Keywords: Interest Rates, Bank Nifty Index Returns, Granger Causality, Johansen co-integration.

Introduction

One of the primary industries that has seen growth over the recent few years is banking. It has wide-open opportunities for wealth creation. It's beyond deposits, loans, and savings, thus leading to a rising return on equity and giving a reasonable price-to-earnings ratio. As a result, today investors prefer to invest in Bank stocks rather than going for fixed deposits in the bank. Further, as we investigate factors influencing bank stock returns, there are many factors affecting bank stock returns. Roll R (1998) investigated the relationship between firm and market-level information that is invested in bank stock prices and pricing for stocks. It has been advanced as bank stock price movements are more aligned with the whole market and are less influenced by bank-specific information. Interest rates are one factor that influences both the whole market (Market Level) and the bank performances (Firm level).

There has always been a well-built connection between rates of interest and stock prices. For this reason, stock analysts and investors must pay close attention to the direction of interest rate swings. This is discussed from two angles. Firstly, interest rates impact the flow of money in an economy. Low-interest rate boosts the economy with more money for spending, and investing, leading to an increase in production and employment. This healthy economic condition is usually good for stock markets. However, the danger associated with too fast growth in the economy is inflation. Thus, the central bank puts the brake on inflation by raising interest rates. High-interest rates shrink the flow of money and make it more expensive. This leads to low corporate profits and hurts stock prices. Second, the necessary rate of return that an investor requires on the stock is influenced by interest rates. Investors, you can calculate the required rate of return on stocks by multiplying the safe rate of return by a risk premium. A safe rate of return is based on the existing interest rates. If interest rates are high, the risk-free rate increases and decreases with a fall in interest rate. This also influences the risk premium of the investors. Changes in interest rates have an impact on and influence on stock prices and stock index prices.

Present study investigates interest rate sensitivity of the bank nifty index. The present study will address the following research questions.

- Do changes on interest rates affect the short as well as in long term returns of the banking stock indexes, such as the Bank Nifty, Bank PSU Nifty Index, and Bank Private Nifty Index?

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- Is there a negative association between changes in bank stock indexes and interest rate changes?

The research study work's structure begins with responding to these questions, which will help in understanding the banking sector's exposure to interest rate risk. Next, the literature pertinent to the topic is reviewed, and the study's data, model, and approach are listed along with the results and a discussion of the analysis conducted, as well as the research study's conclusion.

Interest Rate Risk Exposure in the Banking Sector

When it comes to interest rate risk, banks are much more vulnerable than other companies. Interest rate fluctuations affect net interest income, which is seen from an accounting or earnings viewpoint, and hence affect the reported earnings and book capital of banks. Furthermore, shifts in interest rates have an impact on banks' underlying economic worth from an economic or capital standpoint.

The earnings viewpoint primarily focuses on short-term risk to earnings. This viewpoint takes into account the impact that variations in interest rates have on a bank's net interest income, or reported earnings. Net interest income will be impacted by the timing of accruing adjustments, changing rates and yield curve links, and options holdings. Interest rate fluctuations affect a bank's fundamental economic value. The fundamental worth of the bank's existing situation is gauged by the economic perspective. This determines how sensitive that value is to variations in interest rates. This examines the impact that variations in financing costs have on the total value of the bank's assets, liabilities, and premium-related balance instruments. These instruments have a monetary worth equivalent to the current worth of their future incomes. The financial worth of value not entirely set in stone by assessing how the agreement's current worth changes for a specific change in loan fees. The monetary perspective separates the gamble aspects associated with long-term valuing instead of the profit viewpoint. The economic viewpoint offers a more thorough assessment of interest rate risk than the profits perspective because it accounts for the impact of interest rate volatility on future cash flow estimations.

Literature Review

Interest rates and bank stock returns have been highly explored areas of research. Comprehending the interest rates and bank stock performance are correlated significant insights for portfolio management and selection. Additionally, researching how interest rates affect stock returns and how that affects indexes is crucial for designing policies..

Alam & Uddin (2009) look at how interest rates & stock prices relate to one another in industrialized and developing nations. In developed nations, there is an adverse association between the variables. Based on the analysis of this relationship with consideration of country-specific characteristics, a mixed association has been seen in emerging countries. Based on the analysis of this relationship with consideration to country-specific characteristics, a mixed association has been seen in emerging countries. The impact of exchange rates on inflation, interest rates, and the composite stock price index is examined by Amanda Dwi Suhadak & Suciany (2020). The study's findings indicate that while the foreign exchange rate has a small but favorable impact, the interest rate has a considerable and negative impact on the composite price index. Most of the studies and results from previous literature always stated that interest rates negatively influenced the capital market. But Theresia Putri Primartha and Nana Diana (2021) from the study found contrary results to the theory. According to their findings, the capital market's stock price index was positively impacted by interest rates. Chang-Ho An (2022) examined a prediction model to estimate financial assets and considered interest rate as one of the variables. The results of the study suggested that creating investment strategies would greatly benefit from an awareness of the causal connection among interest rates including macroeconomic indicators such as stock indexes exchange rates, and the rates of interest under examination.

Data, Model & Methodology

This study assesses how interest rates affect the Bank Nifty Index, the Nifty Private and Nifty PSU Bank Index, over both the long and short term.. Analysis of the rates of interest's influence in the short period is done through the Granger causality test and the long period is done through Johnsen's Co-integration Test.

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The most liquid and highly marketed Indian financial equities make up the Bank Nifty, sometimes referred to as the CNX Bank Nifty. It acts as a benchmark that accurately conveys how Indian banks operate on the capital market to investors and intermediaries in the market.

The reference period of the study is from April 2019 to March 2023. Thus, the Bank Nifty, Nifty Bank Private Index, and Nifty Bank PSU Index data are collected for the reference period. The Indexes data has been collected from the NSE Database. The interest rate (Bank Rate) has been collected for the reference period from the RBI Database. The information examination was performed utilizing Eviews 12.

Examining the descriptive statistics of the study's variables is part of the analysis. The linear link between the variables is quantified using the Pearson correlation coefficient. An individual (univariate) period's potential non-stationarity (change in mean and fluctuation over time) is examined using the Augmented Dicky-Fuller (ADF) test. The unit root test for the Eviews version was utilized for the inquiry. The study's variables were:

Independent Variable	Interest Rates (INTR)
Dependent Variable	Bank Nifty Index (BNI)
Dependent Variable	Nifty Bank Private Index (NBPVTI)
Dependent Variable	Nifty Bank PSU Index (NBPSUI)

The following is the unit root hypothesis as it relates to the unit root test:

Ho: INTR, BNI, NBPVTI, and NBPSUI have a unit root
H1: INTR, BNI, NBPVTI, and NBPSUI do not have a unit root

The statistical hypothesis of the Granger test for causality is used to examine if a sequence of processes can either Granger-cause or help predict another one.. This is what the Granger causality test hypothesis says:
H1: The INTR do not granger cause the BNI.
H2: The INTR do not granger cause the NBPSUI.
H3: The INTR do not granger cause the NBPVTI.
H4: The BNI do not granger cause the NBPSUI.
H5: The BNI do not granger cause the NBPVTI.
H6: The NBPVTI do not granger cause the NBPSUI.

Johansen's co-integration test is utilized to investigate the possibility of a substantial, enduring connection between the unit root and its processes. The tests for co-integration hypothesis are listed below:.:

Ho: INTR, BNI, NBPVTI, and NBPSUI do not have a long-run relationship.
H1: INTR, BNI, NBPVTI, and NBPSUI do have a long-run relationship.

Results and Discussion

The statistical description of the variables is based on the daily return of Bank Nifty, Nifty PSU Banks, Nifty Private Banks, and the Interest rates during the reference period. To get a more meaningful comparative picture of the movement of the variables, we have clubbed the variables of the study in **Table 1**. The information provided in the table relates to three parameters, viz, the return, the risk, and the nature of contributions. The return parameter includes mean daily return, median daily return, and maximum and minimum return. The risk parameter is covered under standard deviation and finally, the nature of the distribution is captured by the skewness, kurtosis, and JB statistics.

Table 1 The Variables' Descriptive Statistics for the period April 2019 to March 2023

STATISTIC	**INTR**	**BNI**	**NBPSUI**	**NBPVTI**
MEAN	4.995363	0.045824	0.035127	0.035333

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MEDIAN	4.650000	0.090633	0.037887	0.032869
MAXIMUM	6.750000	10.51173	10.74156	11.05481
MINIMUM	4.250000	-16.73401	-13.16055	-17.87718
STD. DEV	0.847215	1.801135	2.262901	1.844086
SKEWNESS	0.613631	-0.777841	-0.273733	-0.848292
KURTOSIS	1.898453	14.85073	6.226117	16.43542
JARQUE-BERA	112.4092	5904.879	442.5788	7580.072
PROBABILITY	0.000000	0.000000	0.000000	0.000000
SUM	4955.400	45.45756	34.84576	35.05047
SUM SQ DEV	711.3137	3214.889	5074.633	3370.047
OBSERVATIONS	992	992	992	992

Source: Work done by the author with E-Views

Table 1 reveals that the mean daily returns of all the indexes are positive returns. In terms of risk elements, the standard deviation of the indexes is higher as compared to their returns. Lastly, the distribution's nature shows that interest rates have a positive skew while stock index returns are negatively skewed. However, none of the distributions including the bank index appears to be following the normal distribution, this is given by the JB statistic value for all these bank stock indexes, and interest rates distributions are nowhere close to 5.99 which is for the normal distribution (Normal JB < Chi-Square at 2 df whose value is 5.99)

Table 2 presents the findings about the ADF test's stationarity of variables. The computed t-values, that are more negative compared to the CV (critical values) at Sig. 5% (significance level), along with corresponding p-values, which are less than 0.05 for all the variables, definitively demonstrate that the INTR, BNI, NBPVTI, and NBPSUI Index have stationary at Difference (1). The variable of the investigation has a unit root, so the alternative hypothesis (H1) of stationarity is accepted and Ho (the null hypothesis) is thus supported**.**

Table 2: Results of ADF Unit Root Test of Variables		
Null Hypothesis	**Computed ADF t-values**	**Test Results**
D (BNI has a unit root)	-29.83791 (0.0000)	Ho – Rejected (at Diff 1)
D (NBPSUI has a unit root)	-30.83079 (0.0000)	Ho – Rejected (at Diff 1)
D (NBPVTI has a unit root)	-29.65909 (0.0000)	Ho – Rejected (at Diff 1)
D (INTR has a unit root)	-31.44930 (0.0000)	Ho – Rejected (at Diff 1)

Source: Work done by the author with E-Views

Table 3 displays the various correlation matrices. The independent variable i.e INTR has a negative correlation with the other dependent variables i.e BNI, NBPSUI and NBPVTI signifies that the findings are not an exemption from the previous works of literature. The result of the table also highlights the low degree of correlation between the factors of the review in the study.

Table 3: Multiple correlations between selected BNI, NBPSUI, NBPVTI AND INTR for the year 2019 - 2023				
	BNI	**NBPSUI**	**NBPVTI**	**INTR**
BNI	1			
NBPSUI	0.7315	1		
NBPVTI	0.9922	0.6923	1	
INTR	**-0.0427**	**-0.0481**	**-0.0417**	1

Source: Work done by the author with E-Views

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Table 4 shows the analysis of the data for the variables of Granger Causality between the INTR and BNI, NBPSUI, and NBPVTI. The planned F-STAT (F-Statistics) indicates that accepting the null hypothesis is possible. The results demonstrate that the Nifty Bank Private Index (NBPVTU), the Nifty Bank PSU Index (NBPSUI), and the Bank Nifty Index (BNI) are all independent of interest rates. Consequently, there isn't a transient partnership.

Table 4: Pairwise Granger Causality Tests		
Null Hypothesis	**F-Statistic**	**Prob.**
D(BNI) does not Granger Cause D(INTR)	2.719	0.0664
D(INTR) does not Granger Cause D(BNI)	1.43865	0.2377
D(NBPVTI) does not Granger Cause D(INTR)	2.91104	0.0549
D(INTR) does not Granger Cause D(NBPVTI)	1.16759	0.3115
D(NBPSUI) does not Granger Cause D(INTR)	0.10379	0.9014
D(INTR) does not Granger Cause D(NBPSUI)	0.12091	0.8861
D(NBPVTI) does not Granger Cause D(BNI)	0.17193	0.8421
D(BNI) does not Granger Cause D(NBPVTI)	0.10749	0.8981
D(NBPSUI) does not Granger Cause D(BNI)	0.42767	0.6521
D(BNI) does not Granger Cause D(NBPSUI)	1.41909	0.2424
D(NBPSUI) does not Granger Cause D(NBPVTI)	0.45841	0.6324
D(NBPVTI) does not Granger Cause D(NBPSUI)	1.28387	0.2774

Table 5 Figure 5 displays the findings from the investigation into the co-integration and considerably long period association hypotheses. The null hypothesis is rejected if, at a given confidence level, the computed trace test statistics value is smaller than the crucial value.. The four data sets—INTR, BNI, NBPSUI, and NBPVTI—cointegrate with one another.

Table 5: Johansen co-integration rank test between selected BNI, NBPSUI, NBPVTI, and INTR for the year 2019 – 2023. Trend Assumption, Linear deterministic trend. Lags interval (in first differences), 1 to 4; unrestricted co-integration rank test (trace)				
Hypothesized data		Trace	At 0.05	
Number of CE(s)	Eigen Value	Statistic Value	Critical Value	Prob. **
At None*	0.189214	692.4022	47.85613	0.0000
At most 1*	0.167207	485.3773	29.29707	0.0000
At most 2*	0.153290	304.7861	15.49471	0.0000
At most 3*	0.132729	140.5523	3.8414465	0.0000

Source: Work done by the author with E-Views

Conclusion

The goal of the current study was to find out how changes in interest rates (INTR) affected the performance of banking stock indices. namely, the short- and long-term Nifty Bank PSU Index (NBPSUI), the Nifty Bank Private Index (NBPVTI), and the Bank Nifty (BNI). The short period investigation in view of the Granger Causality tests expressed there is no significant short period relationship. The research variables BNI (Bank Nifty), NBPSUI (Nifty Bank PSU Index), NBPVTI (Nifty Bank Private Index), and INTR (Interest Rates) showed a significant cointegration between them, indicating a long-term relationship, according to the long-term analysis depending on the Johansen co-integration rank test. Regarding the correlation between the research variables, INTR (interest rates) and BNI (Bank Nifty), NBPSUI (Nifty Bank PSU Index), and NBPVTI (Nifty Bank Private Index) have a negative link. Granger Causality dictates that the same interest rates have an impact on both the Nifty Private Bank Index & the Nifty PSU Bank Index. The results state Nifty Private Bank Index Returns are influenced by interest rate changes and Nifty PSU Bank Index returns are not influenced by interest rates.

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Future research could move to frame time-bound models toward the estimation and testing of bank stock's interest rate sensitivity.

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