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A Study on the Volatility and Returns of the Indian Banking Sector Index with Reference to NSE Nifty

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Abstract: This paper is a humble attempt to measure the volatility of the Bank index stocks and compare it with that of the volatility of NIFTY. Stock markets in general are considered volatile and volatility plays a key role in measuring the risk-return trade-offs. While there are so many factors that make the stock market volatile, one is very curious to understand if the volatility of the stock market in India is in line with the volatility of the different sectors in India, in this case the banking sector. Estimating volatility enables the pricing of securities and, understanding stock market volatility or individual stock price volatility enables good decisions on the part of investors. Investors who are risk-averse would not be happy to invest in a highly fluctuating stock, whereas those with a thirst for riskiness would happily invest in a highly volatile market. Volatility is simply a measure of variability or dispersion from the mean values. In this study standard deviation and individual beta values have been calculated to get an idea of the volatility.

Keywords: Bank Index, Beta, NIFTY, Risk-Return, Volatility.

I. INTRODUCTION

The capital market in India is a very robust market and has undergone drastic changes in the last two or more decades. Stock markets in India have now become more transparent than ever. Stock markets in general are considered volatile and volatility plays a key role in measuring the risk –return trade-offs. While there are so many factors that make the stock market volatile, it is of general interest to understand if the volatility of the stock market in India is in line with the volatility of the different sectors in India. Banks have been major contributors to the fluctuations in the stock market index (Anbukarasi & Nithya, 2013). Estimating volatility enables the pricing of securities and understanding stock market volatility or individual stock price volatility enables good decisions on the part of investors. Investors who are risk-averse would not be happy to invest in a highly fluctuating stock, whereas those with a thirst for riskiness would happily invest in a highly volatile market. Volatility is simply a measure of variability or dispersion from the mean values. If the dispersion is more it is considered more volatile.

Given this premise, the banking sector is chosen in this study to see if the movements of the banking sector is in tandem with the national stock movements as reflected in the NSE NIFTY. As on date there are 27 public sector banks in India out of which 19 are nationalised banks and six are SBI and its associate banks, the other two being IDBI Bank and Bharatiya Mahila Bank. Apart from this there are 23 private sector banks and a good number of foreign banks operational in the country. Banks in India are regulated by RBI and as such have to comply with regulatory norms like the CRR, SLR, and Basel III among others. Much noise has also been made on the recent problem of NPAs because of which provisioning norms have gone up to meet the minimum capital adequacy standards. RBI in addition also controls the flow of funds in the economy, and hence when it tries to control the liquidity in the economic system it affects banks' lending and thereby the profitability and therefore the demand for these shares. Hence the question of whether the activities and performance of these banks affect or influence the market or does it move in tandem with the market. In this study the Bank index is considered to reflect the banking industry of the nation.

A. National Stock Exchange Index (NIFTY)

National Stock Exchange is the leading index of the Indian Stock market, popularly known as NIFTY 50 or Standard & Poor's CRISIL NSE Index(S&P CNX Nifty). Nifty stocks consist of 23 different economic sectors. One of the sectors which have active trading in the National Stock Exchange is the Banking sector.

B. Bank index

Popularly known as the Bank Nifty or CNX Bank Index provides an overview of the stock market performance of the Indian banking sector. It comprises 12 banks which are considered the most liquid and large capitalised stocks. The index serves as a benchmark and enables investors to easily understand and make rightful decisions with regards to investments in the banking sectors as it reflects the performance of banks in India. The list of the 12 banks appearing in the Bank Nifty is given below:

1. Axis Bank Ltd.
2. Bank of Baroda
3. Bank of India
4. Canara Bank
5. Federal Bank Ltd.
6. HDFC Bank Ltd.
7. ICICI Bank Ltd.
8. IndusInd Bank Ltd.
9. Kotak Mahindra Bank Ltd.
10. Punjab National Bank
11. State Bank of India
12. Yes Bank Ltd.

At the time of preparing this article nine banks of the bank index appear among the NIFTY 50 stock. Bank of India, Canara Bank and Federal Bank do not appear in the NIFTY 50 index stocks.

II. REVIEW OF LITERATURE

William and Vimala (2015) examined the volatility of equity share price of five select private banks listed in the National Stock Exchange. Considering that banks play an important role in the economy of India, an attempt was made to analyse the market volatility of the selected banks by using mean, standard deviation and beta values using the opening and closing prices. It was concluded that the volatility of the closing prices was similar for all the five banks selected for the study.

Anbukarasi and Nithya (2014) made an attempt to bring out the correlation between select stock indices and the NIFTY from January 2013 to June 2014. It was found that there was a significant correlation of all the selected indices except Metal, Pharma, Bank and Realty indices. It was also concluded that the Pharma and Bank indices have a strong impact on NIFTY movements.

Rajamohan.S and Muthukamu.M (2014), conducted a comparative study between bank Index and other sectoral indices using Pearsonian correlation coefficient. It was found that Bank index positively influenced almost all the other sectoral indices. Investors, before investing in any sector, hence need to check the patterns in the banking sector as it could influence the behaviour of other sector stocks.

Bhowmik.D (2013) evaluated the framework of stock market volatility at the country level. According to the study volatility would be spurred by political turmoil or instability and high volatility reduces growth rate of the economy. Volatility also influences the volume of international trade and increases current account deficits

Shanmugasundram and Benedict (2013) conducted a study on the volatility of the sectoral indices with reference to NSE. In this study the risk relationship in different time intervals of the CNX NIFTY index and five sectoral indices including Auto index, Bank index, FMCG index, Infrastructure index and IT index was examined. The results of the study did not support any significant difference across the risk of sectoral indices and NIFTY.

Swarna Lakshmi (2013) used the ARCH model to measure the volatility in NIFTY and other 11 select sectoral indices in India for the period 2008 to 2013. A conclusion was made on the 11 sectors volatility in comparison with the NIFTY and it was found that among the 11 sectors, the realty sector was the most volatile than any other sector. The paper also has discussions on the reasons for the same.

III. SCOPE OF THE STUDY

The study is limited to only a period of one year from April 2015 to March 2016 and is restricted to measuring and comparing the volatility and returns of the 12 bank index stock with the NIFTY index. There are various other sectors which are not covered in this study. In addition stock market movements are affected by several other factors that are not discussed in this paper.

IV. OBJECTIVE OF THE STUDY

The study is done to find out the nature and extent of relationship between returns and volatility of the Bank Index and the NSE NIFTY and also to find out if the stock appearing in the Bank index are more or less volatile than the NSE NIFTY. Hence the returns of the NIFTY index and the banks forming the banking sector index will be analysed and the level of volatility will be examined.

V. RESEARCH METHODOLOGY

A. Data used

The data used in for the study is purely secondary in nature where the daily closing of the NIFTY index and daily closing prices of stock of the 12 banks that appear in the bank index is used. The daily closing prices have been collected from the official website of National stock Exchange (NSE) for a period of one year from April 1st 2015 to 30th March 2016.

B. Tools used for analysis

For data analysis here the descriptive statistics with regard to daily closing prices average, high and low and the daily returns are used. Volatility is explained using standard deviation and beta. The NIFTY index returns and each of the bank returns have been correlated to see the relationship. An explanation of the terms and method used is given below:

C. Daily returns

To measure daily returns of the NIFTY index as a percentage between any two days, the difference between closing index value of two days divided by the first day is taken. To measure the daily returns of the 12 bank stock as a percentage between any two days, the difference between closing price of the individual stock value of second day and the first day is divided by the closing price of the individual stock of the first day.

D. Standard deviation as a measure of volatility

Volatility is a measure of dispersion. If volatility is high, the risk of the security is considered high as well. Here standard deviation is used as a tool to measure volatility. Standard deviation is measure of dispersion of a set of data from its mean. The formula for standard deviation is

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

Where σ the standard deviation, x is each value of the data set, \bar{x} is the mean value of the data set and n is the number of values in the data set.

E. Beta as a measure of volatility

Beta has also been calculated for the 12 bank stock appearing in the bank index .Beta is also known systematic risk to indicate if the bank stock are more or less volatile than the NIFTY. Beta measures the volatility of the stock to the market. A beta of more than 1 is an indication that the stock's price is more volatile than the market. So for e.g., if the beta of a stock is 1.3, it is meant to be 30 percent more volatile than the market. The formula used to arrive at Beta (β) is as follows:

$$\beta = \frac{COV (Market, Stock)}{VAR (Market)}$$

Where β is Beta, $COV (Market, Stock)$ is the covariance between the market and stock and $VAR (Market)$ is the variance of the market. All calculations have been done using MS Excel 2013

F. Correlation

Correlation is used to find if there is any relationship between the NIFTY index returns and the individual stock returns. In this paper a one to one correlation using Ms Excel is used. The data sets of daily returns of NIFTY index were correlated to the daily returns of the 12 banks individually and the correlation coefficient was generated to check if there is a relationship.

VI. ANALYSIS AND INTERPRETATION*A. Descriptive statistics of the banks and NIFTY index*

Data relating to the daily closing value of the index and the 12 stock for the period between April 2015 and March 2016 were extracted from the NSE website and the mean and standard deviation was arrived at. The table one below shows the daily high, low, average equity share price and standard deviation of the 12 bank index stocks and also the highest, lowest and average values and standard deviation of the NIFTY index.

TABLE I
Closing Index and bank index stock prices: Highest, Lowest, Mean values and
Standard Deviation for the period April 2015 –March 2016

Name of Index / Stock	Closing Highest	Closing Lowest	Closing Mean	Standard Deviation
NIFTY INDEX	8834.00	6970.60	7978.58	427.65
Axis bank	608.65	373.20	494.70	65.11
Bank of Baroda	212.90	113.70	160.01	19.39
Bank of India	228.35	83.30	145.16	40.59
Canara Bank	404.80	158.45	271.69	62.55
Federal Bank	155.90	43.05	78.18	36.25
HDFC Bank	1115.25	942.65	1046.17	38.64
ICICI Bank	331.15	183.00	272.97	37.39
IndusInd Bank	977.70	794.55	897.98	48.34

Kotak Mahindra Bank	1445.60	600.65	853.48	309.85
Punjab National Bank	173.30	71.00	128.30	26.65
State Bank of India	292.60	151.80	237.52	37.50
Yes Bank	882.30	629.70	770.64	61.34

(Source: compiled with data from <http://www.nseindia.com/>)

The table shows that the highest value of the NIFTY index for the period April 2015 to March 2016 was 8834 with the lowest being 6970.60 and a mean of 7978.58 and a standard deviation of 427.65. Among the banks listed in the Bank index, Kotak bank had the highest standard deviation of 309.85 reflecting highest fluctuation in price. This could possibly be attributed to the merger of Kotak Mahindra bank and ING Vyasa bank in April 2015 among other reasons. Bank of Baroda has the least standard deviation of 19.39 reflecting least fluctuation in price.

B. Average returns of the Index and Bank stocks

The average of daily returns for the Bank index stocks and Average NIFTY daily returns was calculated. The average returns of the NIFTY index for the period April 2015 –March 2016 was negative (-0.02%). Average daily returns for the 12 stock for the corresponding period are presented in Table two below.

TABLE II
Average Daily returns of the 12 bank index stock for the period
Between April 2015 and March 2016

Sl.No	Name of the bank	Average daily returns (in %)
1	Axis bank	-0.08
2	Bank of Baroda	-0.01
3	Bank of India	-0.27
4	Canara Bank	-0.25
5	Federal Bank	-0.32
6	HDFC Bank	0.02
7	ICICI Bank	-0.10
8	IndusInd Bank	0.03
9	Kotak Mahindra Bank	-0.19
10	Punjab National Bank	-0.21
11	State Bank of India	-0.11
12	Yes Bank	0.04

(Source: Compiled)

The average daily returns shown in the table indicates returns similar to the NIFTY index average returns. All the stock in the bank index have small amounts of negative returns for the period mentioned except HDFC bank and Yes Bank which have shown a small but positive returns of 0.02 percent and 0.04 percent respectively.

C. Correlation between the bank index stock and NIFTY index

The correlation statistics between the daily average returns of the individual banks with the NIFTY index is presented in Table three. From the table it is very clear that all the banks' returns have positively correlated with the NIFTY index. HDFC bank among the 12 banks has the highest correlation (0.79) with the NIFTY index, followed by ICICI bank (0.74), Yes bank (0.72), and IndusInd and Axis bank (0.71 each), SBI (0.69), Bank of India (0.67), Canara Bank (0.64), PNB (0.61), BOB (0.53). Federal bank and Kotak bank have the least correlations of 0.40 and 0.41 respectively.

More than 75 percentages of the stocks in the bank index have positive correlations of more than 0.60 with that of the NIFTY index, reflecting that both the bank index stocks and the NIFTY index move parallel or vary together.

Table III
Correlation between Bank index stock and NIFTY index
For the period April 2015 to March 2016

Sl.No	Name of the bank	Correlation with NIFTY index
1	Axis bank	0.71
2	Bank of Baroda	0.53
3	Bank of India	0.67
4	Canara Bank	0.64
5	Federal Bank	0.40
6	HDFC Bank	0.79
7	ICICI Bank	0.74
8	IndusInd Bank	0.71
9	Kotak Mahindra Bank	0.41
10	Punjab National Bank (PNB)	0.61
11	State Bank of India	0.69
12	Yes Bank	0.72

(Source: calculated and compiled)

D. Beta of Bank Index stocks

As mentioned earlier beta reflects the volatility of the respective stock in relation to the market movements which is in this case considered as NIFTY index movements, as NIFTY reflects market movement. A beta of more than 1 is an indication that the stock's price is more volatile than the market.

Beta value has also been calculated for all the 12 bank stock appearing in the bank index using Ms Excel 2013. The data related to daily returns of the NIFTY index and daily returns of the stock were used to arrive at the beta value to explain the share volatility corresponding to the index. Table 4 presents the details of calculated Beta values of the 12 banks.

TABLE IV Beta values of the banks for the period April 2015 –March 2016

Sl.No	Name of the bank	Beta (β) of the stock
1	Axis bank	1.43
2	Bank of Baroda	1.57
3	Bank of India	1.65
4	Canara Bank	1.56
5	Federal Bank	1.44
6	HDFC Bank	0.80
7	ICICI Bank	1.48
8	IndusInd Bank	1.08
9	Kotak Mahindra Bank	1.37
10	Punjab National Bank (PNB)	1.42
11	State Bank of India	1.47
12	Yes Bank	1.54

(Source: calculated and compiled)

A look at the table four gives a clear indication that all the bank stock appearing in the bank index have been highly volatile during the period. Bank of India shows the highest beta value of 1.65 followed by Bank of Baroda (1.57), Canara Bank (1.56), Yes Bank (1.54), ICICI bank (1.48), SBI (1.47), Federal bank (1.44), Axis bank (1.43), PNB (1.42), and Kotak Mahindra bank (1.37), IndusInd Bank (1.08), and the lowest beta value among the banks was HDFC bank with 0.80 beta. This gives a clear indication that all banks except HDFC bank were more volatile than the market.

VII. DISCUSSION AND CONCLUSION

The objective of the paper was to present the nature and extent of relationship between returns and volatility of the Bank Index stocks and the NSE NIFTY and also to find out if the stock appearing in the Bank index are more or less volatile than the NSE NIFTY. Banks in India as in any country are highly regulated and the macro level decisions of the economy could have a direct impact on the banking sector.

Stock markets in general are considered volatile and volatility plays a key role in measuring the risk –return trade-offs. While there are so many factors that make the stock market volatile, this study attempted to measure the volatility of the banking sector and compare it with that of NIFTY. Estimating volatility enables the pricing of securities and, understanding stock market volatility or individual stock price volatility enables good decisions on the part of investors. Investors who are risk-averse would not be happy to invest in a highly fluctuating stock, whereas those with a thirst for riskiness would happily invest in a highly volatile market.

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