Research Article

RISK AND RETURN ANALYSIS OF SELECTED BANKING STOCKS IN INDIA

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A R T I C L E I N F O	A B S T R A C T
	Banking sector is the backbone of Indian economy, when it comes to share market it is not only a fruitful avenue for investment but also is 'volatile'. Banking sector has shown a robust growth in the recent years. Like any other sector, investments in banking stocks isalso subjected to risk as it is the most sensitive sector, always affected by the changing financial policies of the country. This paper makes an attempt to analyze the risk and return of the five selected bank stocks using GARCH (1, 1) model worked out byTim Bollerslev. The results showed an arch effect on the daily return during the period 2010 to 2013. The study also revealed the persistence of volatility for a long periodamong the selected bank stocks

INTRODUCTION

An investment is an asset or item that is purchased with the hope that it will generate income or will appreciate income in future. In other words, it is the employment of fund with an expectation of a positive rate of returns. Oncea person decided to invest, next question that comes into is mind is where to invest? There are number of investment alternative available for a person to invest such as real estate, bullion, banks, insurance, chit fund, stock market, etc. Among this stock market occupya distinct position as it provides an investor the opportunity to earn higher return with a short span of time. Not only that the investor alsoget an opportunity to invest their savings in different sectors and industries such as Automobile, IT, FMCG, Banking, Pharmaceutical, Tele Communication etc. Like every coin has two sides the stock market is also subjectedto certain limitation. Investing money in stock market is unpredictable and unstable in nature. The success and failure of the investment depends on the market volatility as well as investment strategy adopted by the investor. The investment strategy is considered a crucial factor because a good investment strategy can convert even worst market condition to a favourable one. Banking sector in India has shown a tremendous growth in the recent past. Total banking assets in India is expected to cross US$ 28.5 trillion in 2025. This is due to the government efforts to bringaccess to banking system by promoting banking-technology and expansion of banking facility in the unbanked and metropolitan regions. Moreover, India's banking sector has remained stable despite global

meltdown, thereby retaining public confidence over the years. Despite these positive impact, bank stock is considered as one of the most sensitive avenue of investment in Indian stock market. Investing in this sector is highly risky because apart from factors such as Earning per share, P/E Ratio, Trade cycle etc. this sector is also directly affected by economic policies like Cash Reserve Ratio, Statutory liquidity Ratio, Repo, Measure against inflation, and various decision taken by RBI and Government of India. Only through an intelligent investment decision it ispossible for an investor to obtain fair return from sensitive sector like banking.This study makes an attempt to conduct a risk & return analysis of selected banking stocks in Indian stock market.

Statement of the Problem

Banking sector is the pillar of our Indian economy and it has a vital role in anycountry's economic development and stability that have been learnt from the past global financial crisis.we know investing in share market is not an easy task. It is subjected to large fluctuation especially when it comes to banking sector, because apart from conventional factors, this sector is directly affected by non-conventional factors such as RBI policy andpolicies issued by Government of India. Thus this particular study aims to conduct risk & return analysis (volatility) of selected banking stocks in Indian stock market (NSE)

Objective of the Study

- To undertake a risk and return analysis of selected bank stocks

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- To make comparative study on the performance of selected public sector bank and private sector bank in Indian capital market

REVIEW OF LITERATURE

Mr. Sunil M RashinkarandMrs. Divya U (2014), conducted a study on Market Risk Analysis of selected Banking Stock in India, the study was limited to five nationalized banks in India. And it includes State Bank of India, Industrial Development Bank of India, Syndicate Bank, Punjab National Bank, Bank of Baroda. And the duration of study was 1 year (1 July 2013- 31 march 2014), and the tool used for analysis was Beta Coefficient. The study reveals that the betas of State Bank of India, Industrial Development Bank of India, & syndicate bank were negative which implies that these stocks are moved against the market and less affected by market risk. On the other hand the betas of Punjab National Bank & Bank of Baroda were more than one. It indicates that these stocks were exposed to high market risk.

Dr. S. Krishnaprabha & Mr.M. Vijayakumar (2015), conducted a study on risk & return analysis of selected stocks in India, the study was not only confined to banking sector it also include IT, Automobile sector, Pharmaceutical Sector, Fast Moving Consumer Goods Sector. The study to incorporate at least five companies from every sector, and the period of the study was 5 years (1st January 2010 to 31st december2014), and the major tool used for analysis are Beta, Standard Deviation & variance. And the study suggest that Banking sector and Automobile Sector possess high risk and gives low return on the other hand Information Technology, Fast moving consumer goods & Pharmaceutical possess low risk and high return.

Dr.Premachandran (2016), conducted a study on Volatility and Return of Indian Banking sector index, this study also intended to analyze risk and return of 12 banks listed in Bank Nifty. The study was limited to a period of one year starting from first April 2015 to 31 March 2016. Tool used for analysis are daily returns, Beta and standard deviation as measure of volatility and correlation. And the study suggest that except HDFC bank all other highly volatile than the market because the Beta appearing more than 1 for all other stocks.

Mr. K.OEmenike and Mr.W.U.Ani (2014), conducted a study on Volatility of banking sector stock returns in Nigeria. The study was based on most capitalized and liquid banks listed on the Nigerian stock exchange, and it include Access bank Plc, ETI Plc, Diamond bank Plc, FidelitybankPlc, and GTB Plc. Others are: Skye bank Plc, Sterling bank Plc, United Bank for Africa, Union bank Plc, and Zenith bank Plc. The period of study begins from 3rd January 2006 and ends on 31st December 2012. And the tool used for analysis is ARMA-GARCH Model, and the study suggest that stock returns volatility of the Nigerian banking sector move in cluster and that volatility persistence is high for the sample period. The results also indicate that stock returns distribution of the banking sector is leptokurtic and that sign of the innovations have insignificant influence on the volatility of stock returns of the banks.

Dr.RatnaSinha (2013), conducted a study on Risk and Return analysis in equity investment in banking sector. The study tries to make a comparative study on banking equity performance with two other major sectors such as IT and Real. In order to undertake the study, he takes sample of eight banking companies listed in Indian stock market. The major tools used for analysis are Beta, Alpha, variance, standard deviation and correlation. And the study suggests that there is no significant relation of return in between the banking and non-banking equity.

RESEARCH METHODOLOGY

Research Design

A research is purely and simply the framework and plan for the study that guides the collection and analysis of data. 'Analytical research' technique was adopted in the project. Analytical research is designed to analyze the facts/information available to make a critical evaluation

Source of Data

The study is purely based on secondary data, daily share price of five selected stocks both private sector and public sectors banks (Axis bank, Canara bank, ICICI bank, PNB, SBI) listed in NSE are collected from 1 January 2010 to 31 December 2013 for the analysis.

Tools of Data Analysis

Garch (1,1)

There are various measures of volatility. Modeling and forecasting volatility is perhaps the most important area of research in the whole of finance in the last two decades. Volatility as measured by the standard deviation or variance of returns is often used as crude measure of the total risk of financial asset. It involves calculating the variance or standard deviation of returns in the usual way over some historical period and this then becomes the volatility in asset returns. Thus we want a measure of volatility that changes over time. Such a measure of time varying volatility is known as Autoregressive Conditional Heteroskedasticity (ARCH) was first suggested by Engle (1982). The original model was later extended in many directions one of this was GARCH

One of the drawbacks of ARCH specification, according to Engle (1995), was that it looked more like a moving average specification than an auto regression. From this, a new idea was born which was to include the lagged conditional variance terms as autoregressive terms. This idea was worked out by Tim Bollerslev, who in 1986 published a paper entitled 'Generalised Autoregressive Conditional Heteroscedasticity' in journal of Econometrics, starting new family of GARCH model.

The GARCH (p, q) model
The general GARCH (p, q) model has following form:
$$Yt = a + \beta'Xt + ut$$
$$ut|\Omega t \sim iidN(0, ht)$$

$$ht = \gamma 0 + \sum_{i=1}^{p} \delta iht - i + \sum_{j=1}^{q} \gamma ju^2 t - 5$$

Which says that the value of the variance scaling parameter**ht**now depends both on past values of shocks which are captured by the lagged squared residual terms, and on the past values of itself, which are captured by lagged htterms

It should be clear to reader by now that for p = *0* the model reduces to ARCH (q).

The simplest form of the GARCH (p, q) model is GARCH (1, 1) model for which the variance equation has the form:

$$ht = \gamma 0 + \delta 1 ht - 1 + \gamma 1 u^2 t - 1$$

This model specification usually performs very well and is easy to estimate because it has only three unknown parameters γ_0, γ_1 and δ_1.

The GARCH (1, 1) Model

To show that the GARCH (1,1) is a parsimonious alternative to an infinite ARCH(q) process consider equation

$$ht = \gamma 0 + \delta ht - 1 + \gamma 1 u^2 t - 1$$
$$= \gamma 0 + \delta(\gamma 0 + \delta ht - 2 + \gamma 1 u^2 t - 2) + \gamma 1 u^2 t - 1$$
$$= \gamma 0 + \gamma 1 u^2 t - 1 + \delta \gamma 0 + \delta^2 ht - 2 + \delta \gamma 1 u^2 t - 2$$
$$= \gamma 0 + \gamma 1 u^2 t - 1 + \delta \gamma 0 + \delta^2 (\gamma 0 + \delta ht - 3 + \gamma 1 u^2 t - 3)$$
$$+ \delta \gamma 1 u^2 t - 2$$
$$= \frac{\gamma 0}{1 - \delta} + \gamma 1 (u^2 t - 1 + \delta u^2 t - 2 + \delta^2 \gamma 1 u^2 t - 3 + \cdots)$$
$$= \frac{\gamma 0}{1 - \delta} + \gamma 1 \sum_{j=1}^{\infty} \delta j - 1 u^2 t - j$$

Which shows that the GARCH (1,1) specification is equivalent to an order ARCH model with coefficients that decline geometrically. For this reason it is essential to estimate GARCH (1,1) models as alternative to high – order ARCH model because with the GARCH (1,1) we have less parameter to estimate and therefor lose fewer degrees of freedom.
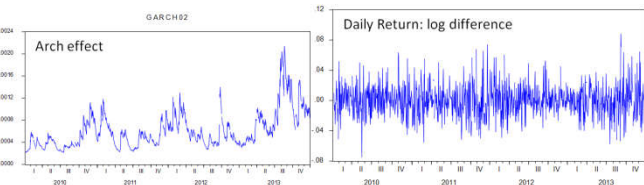
Emperical analysis

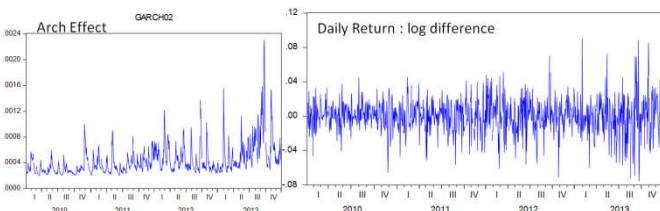**AXIS BANK**
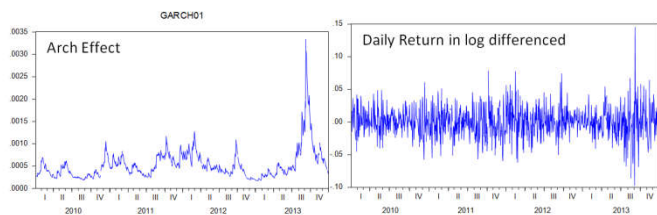
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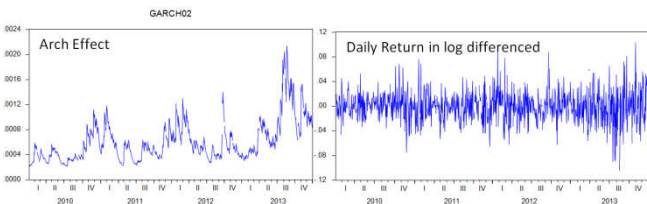
ICICI

PNB

SBI

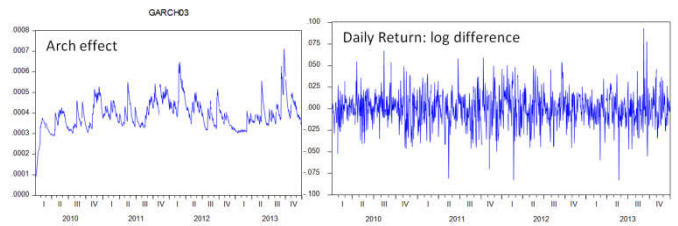***Interpretation***

The above graph show's periods of volatility (daily return) from 2010 to 2013 of the selected bank stocks (Axis, Canara, ICICI, PNB, SBI.). The daily return of all the selected five bank stock has an Arch effect.In the graph we can see all the daily return series are spiky; that is there exists a high period of volatility followed by high period volatility as well as a low period of volatility followed by low period of volatility for a longer period. This means that previous days' prices has an impact on the todays prices. As Residual or Error term shows conditionallyheteroscedasticand it can be represented by Arch and Garch term ie., (GARCH (11) model)

Table No 1 Mean Equation

Bank Stock	Coefficient	Standard error	Z-statistic	Probability	Annual Return
AXIS	0.000999	0.000632	1.580278	0.1140	24.975%
CANARA	0.000195	0.000723	0.270495	0.7868	4.875%
ICICI	0.000559	0.000628	0.889134	0.3739	13.975%
PNB	0.000299	0.000617	0.484150	0.6283	7.475%
SBI	-0.000269	0.000613	-0.438406	0.6611	-6.725%

Interpretation

To further investigate the presence of Arch effect, Arch ML – (Marquardt) test was done. Table No.1 shows the mean equationobtained for all the five bank stocks which is in the form of $Yt = a + \beta'Xt + ut$. It clearly shows the presence of an Arch effect in the return series of bank stock for the period 2010-13. The Arch term (β) for all the bank stocks are significant which means that previous days' information can influence today's annual return.The annual return is obtained by multiplying the coefficient by 250 (250 observations exist in a year). It shows that the performance of private sector banks; AXIS BANK AND ICICI is higher than the public sector bank; PNB AND SBI. CANARA bank is having the lowest annual return.

Table No 2 Variance Equation

	Variable	Coefficient	Standard Error	Z- statistic	Probability
Axis Bank	CONSTANT	9.74E-06	4.08E-06	2.389115	0.0169
	ARCH(β)	0.081931	0.016749	4.891776	0.0000**
	GARCH(α)	0.900708	0.019780	45.53533	0.0000**
Canara Bank	CONSTANT	1.36E-05	4.69E-06	2.899413	0.0037
	ARCH(β)	0.078242	0.016265	4.810480	0.0000**
	GARCH(α)	0.901781	0.018874	47.77946	0.0000**
ICICI Bank	CONSTANT	1.25E-05	4.71E-06	2.656396	0.0079
	ARCH(β)	0.053692	0.013207	4.065464	0.0000**
	GARCH(α)	0.918891	0.019868	46.25055	0.0000**
Punjab National Bank	CONSTANT	4.66E-05	9.39E-06	4.965965	0.0000
	ARCH(β)	0.148641	0.024484	6.070915	0.0000**
	GARCH(α)	0.747118	0.033823	22.08896	0.0000**
State Bank of India	CONSTANT	2.29E-05	8.69E-06	2.633182	0.0085
	ARCH(β)	0.030518	0.012335	2.474143	0.0134**
	GARCH(α)	0.912066	0.030220	30.18045	0.0000**

** shows the significance at 5% level (p<0.05)

Interpretation

The Table No. 2 shows the variance equation or GARCH (1,1) model of selected bank stocks. Variance equation is used to calculate risk. The variance equation or GARCH (1,1) model consist of two coefficients ARCH (β) and GARCH (α), ARCH (β) represents the impact of previous day volatility on today volatility, on the other hand GARCH (α) stance for persistence of volatility. In themodel estimates of the bank stocks under study both the'β' and the 'α' values are high which means there is an impact of daily volatility on the stock prices as well as there is a high volatility persistence during the period. Since the calculated 'p' value is less than 5% level of significance ($p<0.05$), both ARCH (β) and GARCH (α) are significant for all selected stocks.

Table No 3 Total Risk

Name of Bank stocks	ARCH (β)	GARCH (α)	Total Risk (ARCH(β) + GARCH (α))
AXIS	0.081931	0.900708	0.982639
CANARA	0.078242	0.901781	0.980023
ICICI	0.053692	0.918891	0.972583
PNB	0.148641	0.747118	0.895759
SBI	0.030518	0.912066	0.942584

Interpretation

The Table No. 3 showsthe calculation of total risk of the selected banking stocks. It is the sum total of ARCH (β) and GARCH (α). If the sum of both is closer to 1, itimplies volatilitywill remain long. Since the sum obtained is closer to 1the stocks are considered as risky.

CONCLUSION

The stock market investment is always subjected to high risk and high return. So we have to develop timely investment strategies in order to survive in the market and obtain the benefit. In stock market there are numbers of Investment avenues. Among this banking is considered as one of the sensitive avenue for investment. The present study on risk and return analysis of selected banking stocks wasanalyzedusing an econometric model GARCH (1,1) which was developed by Tim Bollerslev. The analysis shows that the daily returns of all the five bank stocks showed an Arch effect (β) which means a period of high volatility is followed by a similar high volatility and a low volatility period is followed by a low volatility. It is therefore important for an investor to analyze the daily volatility of bank stock while constructing a profitable portfolio. The Garch term also showed a persistence of volatility during the period 2010-2013 with high 'α' values. The model estimated is GARCH = C (2) + C (3) *RESID (-1) ^2 + C (4) *GARCH (-1). All the bank stocks are risky as the sum of ARCH (β) and GARCH (α) is closer to 1.

Over all the performance of private sector banks is better than chosen public sector bank. Among the private sector bank Axis bank performs better with a return of 27.34% even though it possesses a risk .982639. And among the public sector banks Punjab National Bank performs better as it gives a return of 7.475 % which is much higher than the return provided by Canara bank and SBI.

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