Impact of Foreign Institutional Investors on Market Volatility with Special Reference to NSE Nifty Fifty

Priyanshi Joshi

Assistant Professor

Idyllic Institute of Management

Indore, Madhya Pradesh, India

Abstract

The Foreign Institutional Investors are considered as an essential source for capital flow in the developing countries like India. The investment by FIIs in the stock market is of great importance as it affects the volatility of the stock market. This subject has drawn the attention of the researchers to study the relationship between FIIs capital flow and volatility of stock market. The study is an attempt to understand FIIs investment and identify its impact on stock market with special reference to NSE Nifty Fifty. The study is conducted using monthly time series on NSE Nifty Fifty and FIIs activity for period of ten years spanning 1st January 2005 to 31st December 2014. To check the non stationary of the time series Augmented Dickey Fuller test (unit root test) is applied. For the purpose of descriptive study, the data has been analyzed through calculation of mean, median, standard deviation, probability, skewness, kurtosis, jarquebera. In addition GARCH (1,1) spillover equation is used to study the impact of FIIs investment on Nifty Fifty. The study has revealed that there is significant relationship between FIIs capital flow and volatility of NSE Nifty Fifty.

Key words: *Volatility, FIIs cash flow, NIFTY FIFTY, GARCH*

Introduction

The investor looks for various avenues where they can invest their money in order to appreciate the value of their money in given period of time. Such an avenue is Stock Market. It is a place where the investors whether domestic investors or foreign investors, invest in the stocks, debentures, bonds and other securities. A country growth is determined by its investments towards the infrastructural development and industry performance. The stock market acts as a bridge in procuring the funds from the investors and the same is utilized for the purpose of industrial growth and in turn result in corporate growth. In terms of growth measurement of stock market, the index is used as proxy to ascertain the level of the growth over the period of the years. Normally stock market indices show ups and downs with respect to their movement due to the price fluctuation and the price of the script is operated under market condition i.e. demand and supply factors. As long as the influx of investment is at the larger extent, the indices of the stock market react positively showing upward trend. The growth of the stock market depends on both retail investors and foreign institutional investors. Since the contribution by the retail investors is far away from the expectation, the role of FII has become a key factor in determining the success of Indian capital market. FIIs have been allowed to invest in all securities traded on the primary and secondary markets, including shares, debentures and warrants issued by companies which were listed or were to be listed on the Stock Exchanges in India.

Investment of FIIs are motivated not only by the domestic and external economic conditions but also by short run expectations shaped primarily by what is known as market sentiment. The element of speculation and high mobility in FII investment can increase the volatility of stock return in emerging markets.

Volatility is an unattractive feature that has adverse implications for decisions pertaining to the effective allocation of resources and therefore investment. Volatility makes investors averse to holding stock due to increased uncertainty. Investors in turn demand higher risk premium so as

to ensure against increased uncertainty. A greater risk premium implies higher cost of capital and consequently lowers physical investment.

Review of Literature

A Aswini, Kumar Mayank (2014) examined the Impact of FII on Stock Market in India. The study concluded that there was a high correlation between FII flow and the raise in the index of Indian stock market in a longer span butthere was a very less impact in the short span that is the correlation between FII flow andthe corresponding raise in the index of Indian stock market was very poor and based onthe chi-square test performed.

Arya & Purohit (2012) documented impact of An Analytical Research on FII in India and found that it has gained a significant role in Indian stock markets. The beginning of 21st century has revealed the real dynamics of Indian stock market and its various benchmarking indices. The study mainly focused to check the volatility of stock market & returns due to the existence of FIIs in India. The GARCH model was used to check and measure the volatility caused by FIIs. It was found that the correlation between the FIIs investment and market volatility and market return has been comparatively low. But the correlation between the FIIs investment flows and SENSEX, NIFTY, market capitalization and market turnover was strong and high. The study investigated that the reason of volatility in Indian stock market was not the function of FIIs investment flows, there were some other factors which were responsible it.

Bansal And Pasricha (2009), assessed the Impact of market opening to FIIs, on Indian stock market behavior. India announced its policy regarding the opening of stock market to FIIs for investment in equity and related instruments on 14th September 1992. Using stock market data related to Bombay Stock Exchange, for both before and after the FIIs policy announcement day, they conducted an empirical examination to assess the impact of the market opening on the returns and volatility of stock return. The study found that while there were no significant changes in the Indian stock market average returns, volatility was significantly reduced after India unlocked its stock market to foreign investors.

Dhwani Mehta (2009), discovered that the Indian stock markets have been experiencing humungous amount of FII flows. This has affected small investors thinking that markets are rigged. For the good news to Indian investors it has been established that out of all the factors, it is basically the performance of Indian stock markets vis-à-vis other emerging and developed markets that probably may cause returns and not the other way round.

Harendra Kumar Behera- "An Assessment of FII Investment in Indian Capital Market" reviews the policies for foreign portfolio investments and empirically assess the impact FIIs investments on Indian equity market. Chiefly, the study tries to examine the effects of FIIs investment on equity return, stock market liquidity and volatility. Using monthly data and ordinarily least square, the study found that FIIs investments have a positive impact on both returns and liquidity. However, the GARCH estimates from daily data suggest FIIs investments increase volatility in Indian stock market.

Karmakar, Madhusudan (2008), measured the 'volatility of daily market return in the Indian stock market' over the period by using the GARCH Model and observed that the market was tranquil and volatile. The level of the volatility was modest for the first two decades. Almost from the beginning there were indications of change in the mood of the market.Volatility touched new high, and if surpassed all previous records and continued to increase till the end of the decade.

Mohan, T.T.Ram (2009),indentified the impact of FII flow into Indian stock market have conferred several benefits on the economy. The study helped augment capital flows at a time when the balance of payment situation was not comfortable. The study allowed Indian firms to access overseas capital at a cost that was lower than the domestic cost of capital. Moreover, it ushered in major reforms in the working of securities markets and in corporate governance. Authors also commented that volatility in FII flows does not pose systematic risk. The study suggested deriving the benefits of FII flows without having to put up with the uncertainties created by the participatory notes component.

Objective of the Study

1. To study the effect of investments of Foreign Institutional investors on the volatility of Indian Capital Market.
2. To examine whether trading Volume Of FII increases or decreases volatility in capital market.

Research Methodology

The study is about to find out the relationship between the FIIs and volatility of Nifty Fifty. The data used in this category is based on Secondary data, collected from national stock exchange and its official website, consider that data sources used as highly reliable due to its function for the financial markets and is core business competences within data supply and gathering. Monthly Closing prices for the time span of ten years from 1st January 2005 to 31st December 2014 of NSE Nifty Fifty, collected for the study. The study is descriptive in nature.

The data is analyzed at three stages. Firstly, unit root test (Augmented Dickey Fuller test) is applied to find out the non stationarity of the data .Secondly,GARCH (1,1) spillover test is applied to find out whether FIIs affects the volatility of Nifty Fifty. Lastly, correlation study is performed.

Hypothesis of the Study

Null Hypothesis: H_{01} = FIIs does not affect the volatility of Indian Stock Market.

Alternative Hypothesis: H_{a1} = FIIs affect the volatility of Indian Stock Market.

Unit Root Test

The Unit Root Test have been used to check whether the Net investment by FIIs and return on NSE NIFTY FIFTY is stationary during the study period from Jan.2005-Dec.2014. We have applied the Augmented Dickey Fuller test and the null hypotheses were tested on monthly returns data at different level of significance i.e. at level and at 1st difference significance level. Most statistical tools are based on the assumption that the time series can be rendered approximately stationary.

Through Unit root test stationary test has been performed on returns. It includes testing at level and first difference level which explains the t-statistics and probability value of data returns of various indices. Results obtained indicate whether the data returns are stationary or not.

Model used

In order to analyze the transmission of volatility or volatility spillover effects between the stock and foreign exchange markets, Generalized Autoregressive Conditionally Heteroscedastic model (GARCH) is taken into consideration.

GARCH model allows the conditional variance to be dependent upon previous own lags apart from the past innovation. Through GARCH model, it is possible to interpret the current fitted variance as a weighted function of long-term average value information about volatility during the previous period as well as the fitted variance from the model during the previous period.

In GARCH models, restrictions are to be placed on the parameters to keep the conditional volatility positive. This could create problems from the estimation point of view. One of the primary restrictions of GARCH model is that they enforce a symmetric response of volatility to positive and negative shocks. This arises due to the conditional variance being a function of the magnitudes of the lagged residuals and not their signs. However; it has been argued that a negative shock to financial time series is likely to cause volatility to rise by more than a positive shock of the same magnitude.

The price and volatility spillover effect between the stock and foreign exchange markets and the degree of integration as well as significant interrelationships can be interpreted in at least two ways. First, a causal relationship may exist such that the volatility in one market induces volatility in the other through a lead-lag relationship. This is possible because the trading hours of the two markets are not common. Second, common international factors could influence the volatility in both the markets, thereby giving rise to an apparent causal relationship between the markets.

In order to find out the impact of Foreign Institution Investment on the Indian Stock Market volatility, we have applied on National Stock Exchange (NSE) NIFTY FIFTY using GARCH model.

GARCH (1, 1) Spillover Equation

H_t (stock indices)= $\omega_{+\beta 1}\varepsilon^2_{t-1} + \alpha 1\ h_{t-1} + \psi$ ...(1)

Where $\omega_0 > 0$, $\beta_1 \geq 0$, $\alpha_1 \geq 0$. In Equations (1), h_t is the conditional variance of both stock indices and exchange rates respectively, which is a function of mean ω_0. News about volatility from the previous period is measured as the lag of the squared residual from the mean equation (ε^2_{t-1}), last period's forecast variance (h_{t-1}) and the squared residual of exchange rate and stock indices, respectively in both the above equations. In the GARCH (1,1) spillover equation, we use the squared residual of another market (ψ) instead of residual on their level, which is used as a proxy for shock in other markets, because in case of GARCH, we make sure that volatility is positive.

Data Analysis

Unit root test

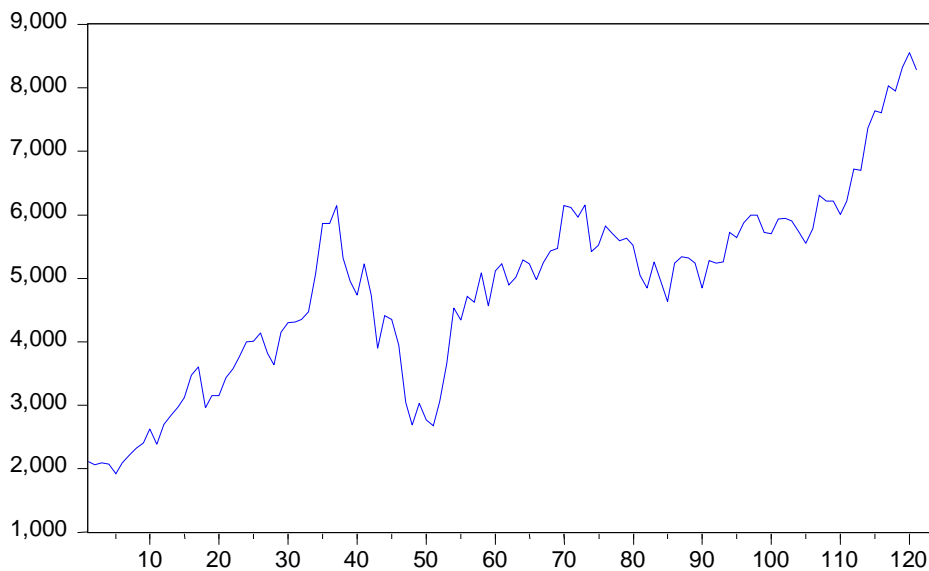A) CNX NIFTY FIFTY Prices at Level

Figure 3 CNX NIFTY FIFTY Prices at Level

The graph indicates that the CNX Nifty fifty data when checked at level results to be non stationary as when the data is tested through unit root test shows a probability value at level 0.8148 which is greater than 5% significant level.

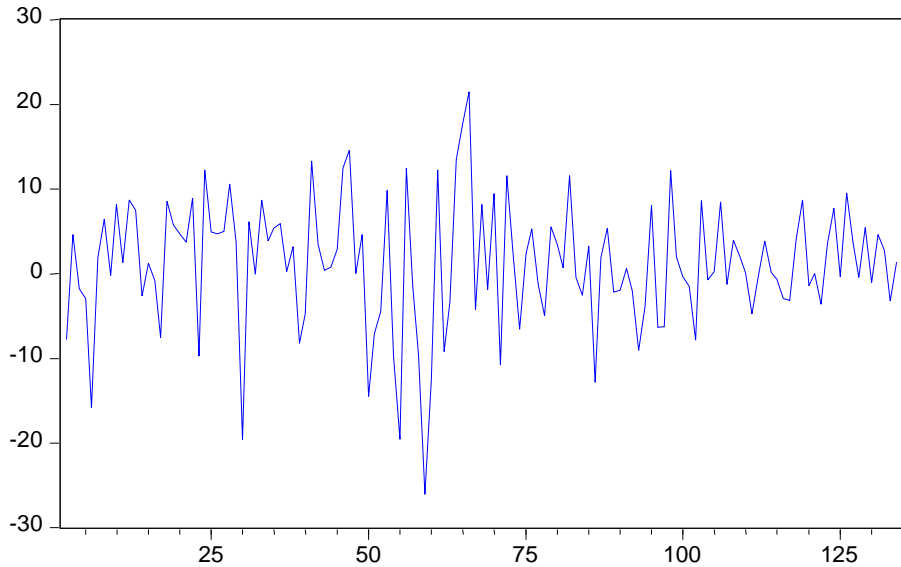B) CNX NIFTY FIFTY Prices at 1st Difference Level

Figure 4 - CNX NIFTY FIFTY Prices at 1st Difference Level

The graph indicates that the Nifty Fifty data when checked at 1st difference level results to be stationary as when the data is tested through unit root test shows a probability value at level 0.000 which is less than 5% significant level.

Tables of Unit Root Test

Table 1

Unit Root Test of NIFTY FIFTY

Nifty fifty data from 1 jan 2005 to 31st jan 2014		
	t-Statistic	Prob.
At level	-0.801397	0.8148
At 1st difference level	-10.38320	0.0000

The result of Unit root test is given in table 1, Nifty fifty data from 1 Jan 2005 to 31st Dec 2014. The probability value at level is 0.8148which is greater than 5% significant level and the probability value when checked at 1st difference level is found to be 0.0000. So it can be concluded that the series is stationary at 1st difference level.

The Augmented Dickey Fuller test and the null hypotheses were tested on monthly returns data showed that probability value is found to be less than 5% which indicates that the data is stationary and null hypothesis has been rejected.

Spillover GARCH Test

Table

	Nifty
C	1.174425 (0.4739)
ARCH	0.149999 (0.4575)
GARCH	0.599998

	(0.0597)
FIISQ	-1.72E-07 (0.1349)

Spillover effect of FII on NSE Indices

Table 5 illustrates the Garch results for National Stock Exchange stock returns in the case of activity of Foreign Investigation Institution. The monthly market prices of NSE was collected for the time period of 10 years from 1st January 2005 to 31st December 2014. This index demonstrates significant impact of the highest and the lowest returns on the stock returns. The results show that FII do not have impact on the volatility of stock returns of CNX NIFTY FIFTY(-1.72E-07).

Descriptive Study

The analysis of the averages (mean and median), dispersion using standard deviation and skewness and kurtosis of Net Investments and Returns is shown in series above in table-1.

Descriptive study have collected all the 4 indices outcome and performed a comparative study in all monthly data and analyzed which month has minimum risk value and maximum return value through taking average of 10 years. The data has been analyzed through calculation of mean value, median value, standard deviation, probability, Skewness, Kurtosis, Jarque-Bera and maximum and minimum value of monthly returns.

1) Descriptive analysis of Nifty Fifty TABLE-1

Month	Mean	Median	Max.	Min	Std.dev.	Skewness	Kurtosis	jarque-Bera	Probability	Sum	Sum Sq. Dev.
Jan	2.594	2.128	12.280	-6.271	4.938	0.224	3.569	0.197	0.905	23.348	195.115
Feb	-2.917	-3.11	12.148	-14.457	8.268	0.271	2.254	0.354	0.837	-29.171	615.353
Mar	0.744	1.553	4.974	-8.207	4.697	-0.463	1.693	1.070	0.585	-7.444	198.569
Apr	3.182	2.520	13.472	-4.772	6.260	0.250	1.818	0.685	0.709	31.825	352.761
May	3.555	1.671	17.729	-7.578	7.863	0.517	2.222	0.698	0.705	35.552	556.513
Jun	-0.109	-0.891	21.487	-19.649	11.594	0.202	2.669	0.113	0.944	-1.099	1209.816
Jul	0.622	2.128	8.641	-19.581	8.086	-1.638	5.013	6.165	0.045	6.226	588.472
Aug	2.327	0.320	12.453	-2.941	4.889	0.961	2.813	1.556	0.459	23.278	215.188
Sep	0.630	0.494	8.744	-9.039	4.968	-0.282	2.833	0.144	0.930	6.306	222.193
Oct	4.428	6.264	12.468	-9.596	7.249	-0.713	2.341	1.029	0.597	44.283	472.973
Nov	-0.682	2.116	14.611	-26.078	11.988	-0.862	3.010	1.239	0.538	-6.820	1293.448
Dec	1.347	1.360649	12.29302	-12.6225	7.689038	-0.19901	2.381938	0.225177	0.8935	13.470	532.0918

2) Descriptive analysis of FII Monthly Data   TABLE 2

	MEAN	MEDIAN	MAX.	MIN.	STD.DEV	Skewness	Kurtosis	Jarquebera	Probability	sum	Sum sq. dev
Jan	1777.97	-23.425	22673.9	-17326.3	10777.17	0.277	3.154	0.138	0.933	17769.65	1.05E+09
Feb	7135.38	5742.45	25217.4	-3754.5	9358.134	0.883	2.730	1.331	0.513	71353.8	7.88E+08
Mar	8462.37	7308	22351	124.4	7482.9	0.652	2.391	0.864	0.649	84623.	5.04E+08

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Apr	4069.93	5288.55	9764.5	-1865.6	4063.819	-0.2279	1.596	0.907	0.635	40699.3	1.49E+08
May	3367.81	-1165.2	21267.7	-8629.9	11800.94	0.6028	1.72272	1.2854	0.5258	33678.1	1.25E+09
Jun	2598.945	3198.5	13990.85	-10577.7	7821.671	-0.4619	2.359401	0.5266	0.7684	25989.45	5.51E+08
Jul	7551.897	8783.985	18132.8	-7120.2	7870.565	-0.4463	2.392865	0.485	0.7844	75518.97	5.58E+08
Aug	1455.965	4220.65	11185.3	-10214.6	7469.932	-0.3137	1.7110	0.856	0.6517	14559.65	5.02E+08
Sep	10820.48	9432.3	29195.8	-7937	11445.37	-0.0293	2.033784	0.3904	0.8226	108204.8	1.18E+09
Oct	6682.369	6441.32	24770.8	-14248.6	11323.65	-0.1996	2.518926	0.1628	0.9218	66823.69	1.15E+09
Nov	5584.547	5946.27	18519.9	-4597.4	7760.485	0.1179	1.994957	0.4440	0.8008	55845.47	5.42E+08
Dec	6285.716	3186.4	24299.2	-3410.9	8632.577	0.8979	2.8219	1.3570	0.5073	62857.16	6.71E+08

The descriptive statistics is used to analyse the behavior of the stock returns. Descriptive stastistics employed on the returns showed that a mean value(average) of 10820.48crores which indicates the returns of FII. Maximum and minimum return range from 29195.8 croresto negative flows of 17326.3crores . These negative flows also indicate selling by FIIs. Further, standard deviation measures the dispersion as 11800.94which imply variability in the net investment by FIIs during the period from Jan.2005 to Dec.2014 collected on monthly returns basis.

6)Findings of the Study

A daily NSE index has very low degree of positive correlation with daily FII's investment.This implies that there are many other macro economic factors have indirectly affected the daily NSE index but their influence on the stock prices cannot be completely ignored. Hence both indices move indirection of FII's investment.

Economic growth i.e. Index of Industrial production (IIP) and Gross Domestic Product (GDP), inflation and interest rate are the basic parameters used by FII's to invest inany countries. FII's investments also guide to economic growth of country since they bring the much neededcapital. FII's helped in the improvement of market efficiency. Since investment of FII's increasing therefore SEBI have to improve market trading efficiency in order to sustain FII's investment.

This research is carried data of time period from Jan2005 to Dec 2014 of FIIs investment, and Nifty.In order to analyze the transmission of volatility or volatility spillover effects between the stock and foreign exchange markets, Generalized Autoregressive Conditionally Heteroscedastic model (GARCH) is taken into consideration.In order to find out the impact of Foreign Institution Investment on the Indian Stock Market volatility, we have applied on National Stock Exchange (NSE) NIFTY FIFTY using GARCH model.

The ARCH term was not found to be significant at 5% level ,in the case of NIFTY But the GARCH coefficient is significant which implies that the past volatility affects present volatility. And so from value of correlation it is clearly seen that there is direct relation between the CNX500 and FIIs. It means with an increase in investment from foreign institution (Purchase of securities by FIIs) there will be an increase in value of CNX500 and vice-versa. Investment by Foreign institutional investor is dynamic in nature and these characteristics of FIIs compel some problem to the Indian stock market. Nifty Fifty is free from influence of FIIs.

Conclusion

An effort has been made to predict the stock market volatility and impact of FIIs to the volatility of the stock market, measured using GARCH(1,1) model. The study revealed that their exists volatility in NIFTY FIFTY due to the net FII activity during the given period of time. The

investment is affected by past and current affairs in the market. The conclusion has been derived that the capital flow through FIIs in Indian stock market is helping the market in expansion and increase the volatility.

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