Foreign Institutional Investors' Trading Activity and Volatility in Indian Stock Market

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ABSTRACT The focus of this paper is on the analysis of volatility of the select Indian stock market indices due to trading activity FIIs. Volatility is a measure of how far the current price of an asset deviates from its average past prices. Financial press and financial analysts have also commented on various occasions that FII movement attributes to the volatility of the stock markets. The study has used monthly data collected from various databases from April 2003 to March 2013. Econometric techniques like unit root test and GARCH (1, 1) model etc to analyse the data. It has been observed that volatility persists in Indian stock market due to net FII activity leading to volatility clustering during the period of study. The results also highlight that Sensex and Nifty are affected by past and recent affects whereas other indices are affected only by past volatility.

INTRODUCTION

Capital market growth is of significant importance to capital formation and for the industrial development in an economy. The removal of capital controls in the developing countries made it viable for institutional investors to invest in these emerging markets in which their investments were previously restricted. Foreign investment refers to any investment that flows from one country to another. Traditionally, foreign investments have been concentrated in selected developed countries. Since the opening up of capital markets in emerging economies they have become an attractive financial destination for foreign investors. India is no exception to it. As a result of such transformations, these economies have witnessed an enhanced financial integration with global markets.

FII is considered as "hot money" flows looking for quick returns in the stock market. Compared to FDI, foreign portfolio investors are considered as 'fair weather friends' who come in when there is money to be made and leave at the first sign of impending trouble in the host country. It had a potentially destabilizing effect on the domestic economy of the host country.

FII: INDIAN EXPERIENCE

In India, the FIIs and Mutual Funds (MFs) constitute major chunk of institutional investments. More often the price behaviour of stock markets in emerging markets like India is affected by trading of institutional investors. The expertise of institutional investors is considered to be comparatively stronger than retail investors in portfolio management. The flow of institutional investment and its relationship with security returns has often been of enduring interest to investors and policy makers. According to the data provided in SEBI's various Annual Reports, FIIs were found to concentrate on equity investment while MFs concentrate on debt investments. Net FII inflows into India have increased steadily through the decade of the 1990s to reach an annual peak of 1, 46,438 crores of rupees in 2011 whereas MFs' net outflows were Rs.22, 024 crores for the same time period.

The result of seamless FII flows was reflected by the boom in the stock markets during 2003 to 2008. Every year since FIIs were allowed to participate in the Indian market, FII net inflows into India have been positive, except for the years 1998 and 2008. There has been a drastic increase in the number of registered FIIs from 3 in 1993 to 1765 in 2011. This reflects the strong economic fundamentals of the country, as well as the confidence of the foreign investors in the growth and stability of the Indian market.

REVIEW OF LITERATURE

A significant number of the market analysts believe that India's leading stock index, the BSE Sensex, is passing through volatile times due to uncertainty engrossing foreign investors. Stock market commentaries in the financial press often cited the 'Global cues' has been often cited as a reason for volatility. Frequent news on the recent behaviour of foreign institutional investors has strengthened the impression that there has been a flight of capital out of India. In this background, an attempt has been made in this study to examine the dynamics of foreign institutional investments and stock market returns in India.

As the foreign investors invest in huge volume and also withdraw in the same manner, it affects the volatility of the markets (Babu & Prabheesh, 2008). Whether the returns determine the inflows or inflows affect the returns, was explored by Rai and Bhanumurthy (2003). They found that the equity returns is the main driving force for FII investment. Batra (2003) and Rai and Bhanumurthy (2003) opined that high volatility of stock markets was due to the arrival of FIIs. But on the other hand Banerjee and Sarkar(2006) did not find any such destabilising effect on the stock index. Dhillon and Kaur (2007) predicted stock return volatility and contribution of FIIs investment to that volatility. They found gross purchases by FIIs have greater implications for the volatility of stock return indices during their study period than volatility in gross sales by FIIs. Goudarzi, Hojatallah and Ramanarayanan, CS (2010) attempted to study the volatility and found that the Indian stock market exhibits the persistence of volatility and mean reverting behaviour.

Coondoo, Dipankar and Mukherjee, Paramita (2004) illustrated descriptive decomposition of observed volatility into three components namely strength, duration and persistence of volatility.

Nidhi, Dhamija (2007) held that the increase in the volume of foreign institutional investment (FII) inflows in recent years has led to concerns regarding the volatility of these flows, its impact on the stock markets and its influence by bringing about changes in regulations. Rajput, Namita et al (2012) empirically analyzed causality and volatility spillover in Indian stock market (NSE) due to FII. E-Garch results confirm bivariate volatility spill over. Arya, Rachna and Purohit, Ashok (2012) assessed impact of FII on stock market in terms of volatility, trading volume and market capitalization. The paper concludes that increase in volume of FII inflows has led to stock market volatility. Since 1990s, several research studies have explored the relationship between FII flows and domestic stock market returns in emerging markets like India whose results have been mixed in nature.

Hence the main objective of the study is to examine the impact of trading activity of FIIs on the stock market returns in terms of volatility.

RESEARCH METHODOLOGY

The study is based on secondary data collected from various publications and from the websites of Reserve Bank of India (RBI), Securities Exchange Board of India (SEBI), National Stock Exchange (NSE) and Bombay Stock Exchange (BSE). Monthly data of the variables selected in the study were taken for a period of ten years from April 2003 to March 2013. Data on purchases (PFII) and sales (SFII) made by FIIs is considered as explained variable. Monthly data on select stock indices is taken as explanatory variables for the study. The data collected has been processed and analyzed by using EViews 5.0 software. The monthly returns of various BSE and NSE Stock Indices are calculated from the average monthly prices. As the research is based on time series data, the stationarity of the data was tested using ADF test. GARCH (1, 1) model is used to capture time varying volatility of stock market. The specification is expressed as follows:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2$$

News about volatility from the previous period which is measured as the mean lag of the squared residual from the mean equation: and is called the ARCH term. Last period's forecast variance i.e., which is called the GARCH term. Also, the estimate of β shows the persistence of volatility to a shock or, alternatively, the impact of old news on volatility.

Results of ADF Unit Root Test

In this study, ADF test has been applied to purchase and sales turnover of FIIs to check the presence of unit root. Since purchase and sales of FIIs are not stationary at level and they are first differenced to make them stationary. Returns from Sensex, BSE100, BSE500, Nifty, CNX100 and CNX500 were taken for the study and were tested for order of integration for further econometric analysis. It is found that stock returns do not show unit root and hence it is concluded that stationarity is found in the selected stock indices at level.

Volatility of Stock Returns and FII Activity: Results of GARCH (1, 1) Model

Volatility is an integral part of stock market with the alternating bull and bear phases. ARCH term shows the effect of recent news on the volatility of the underlying stock market and GARCH term shows the effect of previous vol-

atility on the current volatility of the stock market. In this paper, GARCH (1, 1) results are discussed in this section considering two different cases as follows:

i.   With purchase turnover of FII as exogenous variables
ii. With sales turnover of FII as exogenous variables

Volatility of BSE Stock Returns: Results of GARCH (1, 1) Model due to FII Activity

The parameter estimates of GARCH (1, 1) model are presented in table for all the BSE stock indices related to purchase activity of FIIs.

Table1 Volatility of BSE Stock Returns: Result due to Purchase Turnover of FII

Dependent variable	Model	Garch(1, 1) with PFII			
	Coefficient	Intercept	ARCH	GARCH	PFII
RETSEN	Value of Coefficient	0.000146	-0.046451	1.03673	-3.14E-09
	P − value	0.0588	0	0	0.0119
RETBSE100	Value of Coefficient	-2.40E-05	-0.07091	1.04413	6.49E-09
	P − value	0.8898	0.0004	0	0.0077
RETBSE500	Value of Coefficient	-0.000106	-0.061978	1.02513	1.01E-08
	P − value	0.5234	0.0009	0	0

The sizes of ARCH and GARCH coefficients determine the short-run dynamic of the resulting volatility time series. Table1 reveals that ARCH and GARCH terms are significant for Sensex at 5% level in the case of purchase activity of FIIs. The coefficient of ARCH term is significant at 5 percent level indicating that the recent past information is creating a negative and significant impact on the volatility of the return of the stock market due to purchase activity as the coefficient is negative. In the case of BSE100, the GARCH term impact is higher in comparison to ARCH term which implies that the past volatility has more impact on the future volatility. An increase in purchase turnover of FIIs affects the volatility of BSE500 returns.

Table2 Volatility of BSE Stock Returns: Result due to Sales Turnover of FII

Dependent variable	Model	Garch(1, 1) with SFII			
	Coefficient	Intercept	ARCH	GARCH	SFII
RETSEN	Value of Coefficient	6.20E-05	0.012392	0.99802	-3.34E-09
	P − value	0.5448	0.0022	0	0
RETBSE100	Value of Coefficient	0.000108	-0.085133	1.03896	7.17E-09
	P − value	0.2011	0	0	0.0078
RETBSE500	Value of Coefficient	0.000435	0.103751	0.81192	-2.35E-09
	P − value	0.3029	0.2831	0	0.4906

Table2 summarises the Garch (1, 1) results for BSE stock returns in the case of sales activity of FIIs. The negative coefficients in the sales turnover in the variation equation of GARCH model indicates that any decrease in their value accelerate volatility in Sensex returns. The positive coefficients in the sales turnover in the variation equation of GARCH model indicates that any increase in their value results in volatility in returns of BSE100. The ARCH term was not found to be significant at 5% level for sales turnover, in the case of BSE500. But the GARCH coefficient is significant which implies that the past volatility affects present volatility. In this case also the null hypothesis is rejected.

Volatility of NSE Stock Returns: Results of GARCH (1, 1) Model due to FII Activity

The results of econometric model named GARCH (1, 1) model are presented for purchase activity of FIIs in NSE.

Table3 Volatility of NSE Stock Returns: Result due to Purchase Turnover of FII

Dependent variable	Model	Garch(1, 1) with PFII			
	Coefficient	Intercept	ARCH	GARCH	PFII
RET-NIFTY	Value of Coefficient	0.000435	0.103751	0.811924	-2.35E-09
	P – value	0.3029	0.2831	0	0.4906
RETC-NX100	Value of Coefficient	5.94E-05	0.246061	0.742725	3.61E-08
	P – value	0.8986	0.2408	0.0009	0.2939
RETC-NX500	Value of Coefficient	-8.21E-05	-0.06236	1.041719	6.92E-09
	P – value	0.6398	0.0002	0	0.0019

It is observed from Table3 that the ARCH term was found to be insignificant at a significance level of 5% while GARCH term is found to be positively significant in case of Nifty. Further the impact of purchase turnover of FIIs is negative and very small magnitude but statistically significant. In the case of CNX100, the impacts of purchase turnover of FIIs were found to be statistically insignificant. In the case of CNX500, it can be inferred that ARCH and GARCH coefficients are significant at 5% level of significance.

Table4 Volatility of NSE Stock Returns: Result due to Sales Turnover of FII

Dependent variable	Model	Garch(1, 1) with SFII			
	Coefficient	Intercept	ARCH	GARCH	PFII
RETNIFTY	Value of Coefficient	0.000551	0.094976	0.815353	-4.76E-09
	P – value	0.3293	0.3243	0	0.404
RETC-NX100	Value of Coefficient	0.000136	0.231873	0.747683	3.64E-08
	P – value	0.7841	0.2341	0.0006	0.296
RETC-NX500	Value of Coefficient	0.747683	0.0006	0.963795	1.10E-08
	P – value	3.64E-08	0.296	0	0.0269

It is observed from Table4 that the ARCH term was found to be insignificant at a significance level of 5% while GARCH term is found to be positively significant in case of Nifty with regard to sales activity of FIIs. It implies that past volatility affects present volatility. In the case of CNX100 ARCH estimates are insignificant and GARCH estimates are statistically significant at 5% significance level. In the case of CNX500, large Garch coefficients than Arch coefficients indicate persistence of volatility. Also positive parametric estimates of FII activity imply that any increase in their activity increases volatility of returns from CNX500.

It has been observed volatility persists in Indian stock market due to net FII activity leading to volatility clustering. Volatility in purchases by FIIs is more significant than volatility in sales by FIIs. The results highlights that Sensex and Nifty are affected by past and recent affects where as other indices are affected only by past volatility. The results are in conformance with the studies of Dhillon and Kaur (2007) and Goudarzi & Ramanarayanan (2010). In contrast, Bansal and Pasricha (2009) empirically analyzed the change of market return and volatility after the entry of FIIs to Indian capital market and found that volatility has been significantly reduced after India unlocked its stock market to foreign investors.

CONCLUSION

An effort is made to predict the stock return volatility and contribution of FII investment to that volatility was measured using Garch (1, 1) model. It has been observed that volatility persists in Indian stock market due to net FII activity leading to volatility clustering during the period of study. The results also highlight that Sensex and Nifty are affected by past and recent affects whereas other indices are affected only by past volatility. To conclude, the advent of FIIs in Indian stock market has helped the Indian stock markets to expand and increase volatility.

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