Foreign Portfolio Investment and Stock Market Volatility in India

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Abstract

Although, it is a generally held belief that foreign portfolio flows benefit the economies of recipient countries, policy-makers worldwide have perennial discomfort about such investments. Such portfolio flows are widely termed as "hot money," given its notorious volatility compared to other forms of capital flows as foreign investors make sudden and concerted withdrawals of portfolio investments at the faintest smell of trouble in the host country, thereby accelerating and magnifying the inconspicuous problem of the downfall in stock prices, often leading to disastrous consequences to the host economy. The discussion is often emphasized by the financial press due to the visible evidence of their contemporaneous nature at times of economic crisis. Relationship between foreign institutional ownership and volatility is largely inconclusive. Although the literature in business newspapers and also some previous empirical studies suggest that institutions tend to destabilize prices by increasing turnover levels, there are some good reasons to believe that higher levels of institutional ownership could be negatively related to volatility. In this present study, using firm-level Indian panel data from 2003 to 2013, we analyzed the association between stock's return volatility and their FII holdings in a VAR framework. The results showed that no significant causal relationship exists between the two variables.

Keywords: **foreign institutional investment, volatility, vector autoregression, block exogeneity**

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Volatility is a simple and intuitive concept. It measures variability or dispersion about a central tendency. In a discussion about stock market volatility, the term essentially means 'return volatlity,' that is, dispersion about a mean return over a specified time interval, and generally measured by variance. Extensive theoretical and empirical research has been conducted on the behaviour of stock market volatility, its causes, and effects. Such emphasis is predominantly due to three reasons. First, volatility is an indispensable part of asset pricing. Second, market crashes at various times renewed and invigorated the attention drawn towards the effects of volatility shocks. Dominance of institutional investors over the markets, attributed by many researchers and market practitioners as a prime reason behind the increase in market volatility, increases the importance of volatility estimation and forecasting in implementation of investment strategies. Third, analysis of other market variables can result in spurious references when behaviour of volatility is neglected, as found by some researchers (Connolly, 1989 ; Kryzanowsky & Zhang, 1996 ; Morgan & Morgan, 1987).

Relationship between foreign institutional ownership and volatility is largely inconclusive. The discussion is often emphasized by the financial press due to the visible evidence of their contemporaneous nature at times of an economic crisis. Understanding volatility in the stock markets of emerging economies is of immense importance. Higher equity return volatility leads to higher cost of equity capital. Relation of priced risk to volatility makes the behaviour of return volatility critical for asset pricing and investment strategies. Higher volatility often increases

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the "option to wait" and delays investments (Bekaert & Harvey, 1995). The stochastic volatility option pricing models show that empirical regularities in behaviour of volatility are vital and decisive in the pricing of options. Binder and Merges (2001) suggested that return volatility on a market portfolio is inversely related to the ratio of expected profits to expected revenues for the economy, that is, economic contractions and recoveries are more likely to be accompanied by increased and decreased volatility respectively. They also found that volatility is related to risk free interest rate and equity risk premium. Studies conducted by Engle and Bollerslev (1986), Akgiray (1989), and Schwert (1990) provide evidence that stock volatility is autocorrelated and shows excess kurtosis, indicating the existence of a predictable component in past volatilities, which can be applied for determining security risk premium. French, Schwert, and Stambaugh (1987) showed evidence that expected market risk premium is positively related to the predictable component of stock return volatility.

Engle and Rangel (2008), in their study on stock market volatility across 50 countries, found that volatility in macroeconomic factors such as GDP growth, inflation, and short term interest rate are important explanatory variables that increase return volatility. They provided evidence that high inflation and slow growth of output also have a positive effect on it. In the Indian context, Mohapatra and Panda (2012) showed that influence of index of industrial production and exchange rate on stock market volatility is even stronger than the influence of foreign institutional flows. Engle, Ghysels, and Sohn (2006) documented the advantage of imputing economic fundamentals into a volatility model for long term forecasting. Macroeconomic fundamentals have a significant effect on volatility, even in the short term.

Often, FIIs are blamed for an increase in stock market volatility in emerging economies. The most commonly cited justification is that they tend to trade in larger volumes than most of the other investors and destabilize price levels, thereby inducing higher volatility. Also, FIIs, as all institutional investors, may practice program trading. This may increase volatility of the stocks of the firms with higher level of FII holding. FIIs may or may not have an informational advantage over the domestic investors, although generally, almost always they are perceived to possess superior information. Therefore, all the trades by them are interpreted for some kind of signal and trigger more volume trading in those stocks. Therefore, "noise trading" by FIIs in the absence of any fundamental information can potentially destabilize prices and enhance volatility. Also, institutional investors are prone to herd, and FIIs are no exception. Institutional herding and short term focus may intensify price movement, generating significant spikes in return and volume, thereby increasing volatility.

Review of Literature

Examining the contemporaneous relationship between institutional investors and volatility, Sias (1996) found that accounting for capitalization differences, institutional investors are associated with riskier securities. This positive contemporaneous relationship between volatility and institutional holdings can have two justifications. Institutional investors may find that the higher volatility stocks are more likely to beat market benchmarks and/or are easier to conceal informed trading, and thus may be attracted to them. Therefore, an increase in volatility, in all probabilities, may lead to subsequent increase in institutional ownership. However, findings of Sias's work provide evidence that an increase in relative institutional holdings precedes an increase in relative volatility. This may be due to the reason that institutional investors tend to trade in larger volumes, thereby inducing greater volatility. Another reason may be the use of program trading by them.

Lin, Lee, and Liu (2007) and Chiang, Qian, and Sherman (2009) found that institutional investors are sophisticated enough to have an information advantage over individual investors who, as a group, show uninformed and return chasing behaviour. Cohen, Gompers, and Vuolteenaho (2002) and Campbell, Ramadorai, and Schwartz (2009) argued that institutional investors capitalize on mispricing in equity markets by virtue of their superior information advantage, and hence, a higher level of institutional ownership may be related to more intensive information acquisition, more informed trading, which consequently leads to more informationally efficient prices. Working on the foreign investors' role during the 1997 crisis, Choe, Kho, and Stulz (1999) found evidence that foreign institutional investors' large scale transactions helped the market adjust quickly to

equilibrium levels without causing negative abnormal returns. Rubin and Smith (2009) demonstrated empirically that the direction of correlation between the level of ownership in a firm's equity and volatility is dependent on its dividend policy. Higher levels of institutional ownership are associated with higher volatility among dividend paying stocks, but lower volatility among non-dividend paying stocks. This can be attributed to a greater institutional herding to dividend paying firms than non dividend paying ones. They also observed a fall in institutional ownership level in the aftermath of an increase in volatility.

Bushee and Noe (2000) classified the institutional investors into two types – quasi indexers and transient institutional investors. Quasi-indexers typically have a long investment horizon and low portfolio turnover. Blockholding by such institutions helps reduce the volatility of a firm's stock price. The transient institutions tend to have short investment horizons, and their aggressive trading strategies lead to high portfolio turnover. Presence of this type of institutions in the equity capital increases stock return volatility of the firm. The authors' findings support prior work conducted by Healy, Hutton, and Palepu (1999); in the study, the authors revealed that the institutional investors are attracted to firms with high-quality disclosure practices. Since, both quasi-indexers and transient institutions flock to firms with good disclosure practices, the resultant effect on stock return volatility due to the presence of both these types of institutions in the firm's shares tends to be zero. With firms improving their disclosure quality, transient institutions immediately increase their holdings, but in absence of quasi-indexers doing the same, firms' stock return volatility increases significantly.

Sias (2004) found that institutional investors' demand for a security in a quarter is positively correlated with their demand for security in the previous quarter, which can be attributed to institutional investors following each other into and out of the same securities ("herding"), and institutional investors following their own lag trades. Dennis and Strickland (2002) also reported similar findings. They investigated the relationship between the ownership structure and returns of firms on days when the absolute value of the market's return was 2% or more, and concluded that institutions directly contributed to stock return volatility. They found that a firm's abnormal return on such days is related to the percentage of institutional ownership. They also revealed that such days also show abnormally high turnover in the firm's shares, which is significantly related to the percentage of institutional ownership in the firm. The authors credited this to herding behaviour. Institutional investors respond strongly to large price movements by herding together, thereby further adding to the momentum. Such herding is generally the result of a rational decision making process based on the same set of value relevant information for all of them.

If correlations among stocks are declining, the volatility of the market can remain stable even when volatility of individual stocks increases. Xu and Malkiel (2003) split the total volatility of the individual stocks into systemic volatility and idiosyncratic volatility, and the results of their cross sectional regression analysis indicated that volatility of individual stocks may be related to the amount of institutional ownership and to the firms' objectives in pursuing high growth.

Using Japanese data of portfolio and also firm level, Chang and Dong (2006) found a significant relationship between institutional herding, firm earnings, and idiosyncratic volatility. Their work provides evidence that firms in which institutional herding occurs have high idiosyncratic volatility. They further showed that the contemporaneous relationship between institutional herding and firm idiosyncratic volatility is not due to institutional investors' tendency to herd towards stocks with high idiosyncratic volatility and systematic risk. Dasgupta, Prat, and Verardo (2011) showed that in markets dominated by institutional traders, assets persistently bought (sold) by money managers will trade at prices that are too high (low), and that this will generate return reversals in the long-term, when uncertainty is resolved.

Bae, Chan, and Ng (2004), using investability as a proxy for the extent of foreign investments, found a positive association between return volatility and foreign institutional holdings. They justified the findings by saying that highly investable stocks are more integrated with the world stock markets, and so, are more sensitive to the world market factor. (investability: The Standard & Poor's EMDB reports for each stock, a variable is called the degree open factor that takes a value between zero and one. This measure indicates the quantity of a company's market capitalization a foreign entity can legally own.)

There are quite a handful of reasons to justify the possibility that FII ownership may lead to lower volatility.

Merton (1987) suggested that an increase in investor base as a result of foreign institutional participation leads to greater risk sharing and higher returns. Using daily foreign holdings of Indonesian stocks, Wang (2007) found evidence that foreign investors preferred to hold stocks with low historical volatility and gross foreign trade is positively correlated with contemporaneous volatility, but the preference decayed during their sample period. Although gross foreign trade has a positive association with contemporaneous volatility, greater foreign holdings at the end of a month or quarter reduce volatility in the next month or quarter.

Emerging markets are generally characterized by lax disclosure rules and wide information asymmetry among various classes of investors. Foreign institutions possess better monitoring skills of corporate management, and firm performance has a positive correlation with the level of foreign institutional holding (Khanna & Palepu, 1999). Bacmann and Bolliger (2003), using Latin American data, showed that foreign financial analysts outperformed local analysts of emerging markets in both accuracy and timing of forecasts. Greater FII ownership leads to greater foreign analyst following, reduced information asymmetry, and better price discovery, which results in calming down of volatility. West (1988) also observed that an increase in the information content of prices reduced the variance of stock returns. Therefore, a higher level of institutional ownership is associated with more informative prices and hence, a reduced volatility in stock returns.

Huang and Shiu (2005) examined the local effects of equity ownership by investors who were classified as qualified foreign institutional investors in Taiwan. They found that stocks with higher levels of FII ownership outperform stocks with lower FII ownership. They also observed that the aforesaid effect holds after controlling for firm export, size, or transparency level. Therefore, greater foreign ownership in a firm's stock may induce greater investor confidence, thereby reducing volatility.

Finally, there is a large body of literature showing the positive impact of foreign institutional investors on corporate governance, disclosure, and operational profits, which again leads to better returns and lower volatility. Foreign institutional ownership tends to improve corporate governance and profitability (D'Souza, Megginson, & Nash, 2005 ; Mitton, 2006) and help firms to recover from financial stress (Blalock, Gertler, & Levine, 2005). When faced with agency conflicts, foreign institutions are more likely to raise objection. West (1988) also observed that an increase in the information content of prices reduces the variance of stock returns, which therefore, has a deterrence effect on managerial expropriation (Johnson, Boone, Breach, & Friedman, 2000). Taken together, the evidence suggests that foreign ownership should have a calming effect on volatility, opposite to that of foreign trading activity.

Notwithstanding the aforementioned works, analyzing data from nine emerging economies, Alemanni and Ornelas (2006) found no effect of foreign institutional herding on volatility. The bitter experience of some emerging economies suffering through financial crises has raised concerns about the possible destabilizing impact of foreign capital flows, especially portfolio flows, into and out of host stock markets. In spite of extensive studies about institutional portfolio investments, the impact of institutional holding and more so, of foreign portfolio holding on stock return volatility and vice versa is still largely inconclusive. The Indian financial press has given considerable attention to the FIIs' influence on stock market volatility, but there is little work on the behaviour of volatility of individual stocks in presence of FIIs in the Indian context.

Objective of the Study

The literature survey suggests the existence of inconclusiveness about the causal relationship between FII holdings and stock return volatility. The current empirical study is an attempt to have further insights into the relationship to determine whether there exists any cause-effect relationship between FII holdings and stock return volatility in India.

Data and Research Methodology

➲ **Sample Selection :** The companies included in Standard & Poor CNX Nifty constitute the universe of the

study. The Nifty companies are the focus of this study for three reasons. First, they are widely dispersed in comparison to small cap companies and hence, are expected to disclose more information. Second, these companies' market capitalization constitutes around 95% of market capitalization of all NSE listed companies. It has also been observed that the FII ownership of these top 50 companies constitutes 93% to 96% of overall FII ownership in all listed firms over the study period. For comparing the firms across 40 quarters, we needed to match the sample over the study period. Four companies were excluded due to partial unavailability of data. Thus, the sample selection procedure yielded a final sample of 46 firms (See Appendix 1).

Finding of a structural break in the collected data during 2003-04 indicates the prudence of studying the period since then. This is further strengthened by the fact that in 2003, with the objective of streamlining the registration process of FIIs and reducing the time taken for registration, the dual approval process of SEBI and RBI was changed into a single approval process of SEBI. This led to sudden surge in annual net addition to the number of FIIs and the net investment by them. Hence, the period from 2003-04 to 2012-13 was selected for the purpose of the study.

The study is based upon secondary data. Financial data and other information contained in the CMIE prowess database were used for the purpose of research and analysis. Statistical calculations were done by making extensive use of Microsoft Excel and EVIEWS software package.

➲ **Variable Definitions and Measurement :** Along with FII holdings and volatility, we incorporated five other variables that have been identified in prior literature as being associated with volatility and FII holdings.

➲ **Foreign Institutional Holding ($FII_{i,t}$):** FII holdings for any firm include all shares held by non-residents, irrespective of where they are located. The measure of FII holdings is the most commonly used proxy in the literature and equals the percentage of outstanding common shares held by the FIIs for each company at the end of the quarter t .

➲ **Volatility ($Volat_{i,t}$) :** High levels of returns volatility are supposed to generate more portfolio rebalancing requirements and encourage investors to be more active in selling or buying shares. Thus, increased volatility is expected to increase stock liquidity. Volatility is measured by variance of daily log returns for each stock in each quarter and calculated from daily closing prices as available in the CMIE Prowess database.

➲ **Return ($RET_{i,t}$) :** Researchers have found strong contemporaneous relation between foreign institutional investors' equity flows and stock returns. The ubiquous relationship of stock return with volatility as well as FII flows prompted us to take it as one of the explanatory variables. It is measured by quarterly percentage stock return as available in the CMIE Prowess database.

➲ **Amihud's Illiquidity ($ILLIQ_{i,t}$) :** Amihud's illiquidity is used as one of the variables for vector autoregression. Liquidity estimate of Amihud (2002) has been used as it is said to be one of the best measures to estimate within-country liquidity (Lesmond , 2005). Amihud (2002) formula is given by :

$$ILLIQ_{jt} = \frac{1}{D_{jt}} \sum_{d=1}^{D_{jt}} \frac{|R|_{jdt}}{V_{jdt}}$$

where,

$ILLIQ_{jt}$ is Amihud's illiquidity for stock j for the quarter t,

R_{jdt} , R_{jdt} , and V_{jdt} are, respectively, the return and volume of stock j on day d in quarter t, and D_{jt} is the number of days with observations in quarter t of stock j.

Amihud's illiquidity measures the price impact as the response associated with one unit of trading volume. When a particular stock has a high value of $ILLIQ_{jt}$, it signifies that the price of that stock shifts relatively a lot in response to its trading volume and, so, the stock is regarded as illiquid. The data required for estimation of Amihud's illiquidity were collected from the CMIE Prowess database.

➲ **Firm Size *($SIZE_{I,t}$)* :** Since small firms usually have undiversified portfolio of assets and projects, those are riskier than large firms. Here, the variable $SIZE_{I,t}$ has been measured as natural logarithm of each firm's total market capitalization, as available in the CMIE Prowessdatabase, at the end of the quarter *t*.

➲ **Price to Book Value ratio *($PB_{i,t}$)* :** The price to book value ratio is measured by the market value of equity divided by the book value of equity as of the end of each quarter of the study period. This ratio (P/B) can be viewed as a style variable where a tendency to hold high (low) price to book values signifies a preference for "growth" ("value") stocks. In prior studies, this has been considered as one of the factors for investment decision making by institutional investors. Price to book value ratio of the companies, at the end of each quarter of the study period, was collected from the CMIE Prowess database.

➲ **Promoter's Holdings *($PROM_{i,t}$)* :** Higher promoter's holdings in firms causes lower dispersion in ownership, which results in inadequate information made available to the stock market investors. Due to lack of information, the investors consider the firms highly risky. It is measured by percentage of outstanding common shares held by the promoters of each company at the end of the quarter *t*. Promoter's holding of the companies, at the end of each quarter of the study period, was collected from the CMIE Prowess database.

The Model

First, we used the bivariate granger causality test to explore the relationship between FII holding and volatility. The test involves estimation of the following pair of regressions:

$$VOLAT_{it} = \Sigma_{j=1}^{k} \beta_j VOLAT_{i,t-j} + \Sigma_{j=1}^{k} \gamma_j FII_{i,t-j} + \varepsilon_{i,t} \quad (1)$$

$$FII_{it} = \Sigma_{j=1}^{k} \beta'_j VOLAT_{i,t-j} + \Sigma_{j=1}^{k} \gamma'_j FII_{i,t-j} + \varepsilon'_{i,t} \quad (2)$$

(*k*) signifies the number of lagged values of all the variables included. The optimum lag was chosen for the regressions according to Schwarz information criterion. As volatility and FII holdings are both potentially related to other variables, we extended the causality analysis to multivariate causality through the technique of vector autoregression (VAR) and successive block exogeneity Wald test.

The regression model used for the purpose is as follows:

$$VOLAT_{it} = \alpha + \Sigma_{j=1}^{k} \beta_j VOLAT_{i,t-j} + \Sigma_{j=1}^{k} \gamma_j FII_{i,t-j} + \Sigma_{j=1}^{k} \delta_j PROM_{i,t-j} + \Sigma_{j=1}^{k} \theta_j RET_{i,t-j} + \Sigma_{j=1}^{k} \mu_j ILLIQ_{i,t-j} + \Sigma_{j=1}^{k} \pi_j SIZE_{i,t-j} + \Sigma_{j=1}^{k} \rho_j PB_{i,t-j} + \varepsilon_{i,t} \quad (3)$$

$$FII_{it} = \alpha' + \Sigma_{j=1}^{k} \beta'_j VOLAT_{i,t-j} + \Sigma_{j=1}^{k} \gamma'_j FII_{i,t-j} + \Sigma_{j=1}^{k} \delta'_j PROM_{i,t-j} + \Sigma_{j=1}^{k} \theta'_j RET_{i,t-j} + \Sigma_{j=1}^{k} \mu'_j ILLIQ_{i,t-j} + \Sigma_{j=1}^{k} \pi'_j SIZE_{i,t-j} + \Sigma_{j=1}^{k} \rho'_j PB_{i,t-j} + \varepsilon'_{i,t} \quad (4)$$

Each equation contains *k* lag values of all the variables included. Before estimation of the model, we have to decide on the maximum lag length. Including too many lagged terms consumes degree of freedom and introduces possibility of multicollinearity. Inclusion of too few lags leads to specification errors. We used Schwarz information criterion to determine the optimum lag length.

Empirical Results and Discussion

The Granger causality test was performed to check whether FII holdings influence volatility or vice versa. Lag 2 was chosen as optimum for the regressions as the Schwarz information criterion is lowest at lag 2. At 5% significance level (Table 1), the rejection of the null hypothesis that *VOLAT* does not Granger Cause *FII* (*F* -stat

=3.28472, $p = 0.0377$), suggesting that the direction of causality is from *VOLAT* to *FII.* No reverse causation from *FII* holdings to *VOLAT* is found at lag 2 since the *F* value is statistically insignificant (*F*-stat = 0.14201, $p = 0.8676$).

To ascertain whether the causal direction is valid in presence of contemporaneous and lagged values of the other variables mentioned in the multivariate regression, vector autoregression was performed. Again, a lag length of 2 was taken because the Schwarz information criterion is minimum at lag 2. The results of the vector autoregression and VAR Granger causality have been presented in the following tables (Table 2 and Table 3).

The results in the Table 3 imply that individually, *ILLIQ* ($p = 0$), *R* ($p = 0$), and *SIZE* ($p = 0$) and also all of the explanatory variables jointly ($p = 0$) cause *VOLAT.* But *FII* (0.5711), *PB* (0.6576), and *PROM* (0.7505) do not individually cause *VOLAT*. In *FII* equation, *ILLIQ* ($p = 0.0119$) and *SIZE* ($p = 0$) individually cause *FII* but *VOLAT* ($p = 0.1048$), *PB* ($p = 0.1943$), *PROM* (0.3422), and *R* (0.3742) do not ; although, all of them jointly ($p = 0$) cause *FII*. Thus, in presence of other variables, the results of VAR Granger causality tests contradict the results of Pairwise Granger causality tests and unambiguously indicate that no empirical evidence of causal linkage exist from either side.

Table 1. Pairwise Granger Causality Tests

	Lag 1		Lag 2	
Null hypothesis	***F* - stat**	**Prob.**	***F* - stat**	**Prob.**
FII does not Granger Cause VOLAT	0.02126*	0.8841	0.14201	0.8676
VOLAT does not Granger Cause FII	0.06122	0.8046	3.28472	0.0377*

** Null hypothesis rejected at 1% level of significance.

* Null hypothesis rejected at 5% level of significance.

Table 2. Vector Autoregression Estimates

	VOLAT			FII		
	Coefficients	**S.E.**	***t* - statistics**	**Coefficients**	**S.E.**	***t* - statistics**
VOLAT(-1)	0.535221	-0.02547	[21.0168]	-0.02669	-0.01258	[-2.12177]
VOLAT(-2)	0.121245	-0.02498	[4.85386]	0.017302	-0.01234	[1.40243]
FII(-1)	-0.03598	-0.05244	[-0.68610]	0.999881	-0.0259	[38.6054]
FII(-2)	0.043615	-0.05238	[0.83268]	-0.02145	-0.02587	[-0.82914]
PROM(-1)	0.011857	-0.03108	[0.38150]	-0.01234	-0.01535	[-0.80398]
PROM(-2)	-0.00822	-0.03069	[-0.26796]	0.00895	-0.01516	[0.59041]
R(-1)	0.038986	-0.01194	[3.26482]	0.006002	-0.0059	[1.01774]
R(-2)	-0.01861	-0.00368	[-5.05993]	0.001743	-0.00182	[0.95949]
ILLIQ(-1)	-0.97522	-0.1382	[-7.05677]	-0.15683	-0.06825	[-2.29768]
ILLIQ(-2)	0.699619	-0.13661	[5.12126]	0.05732	-0.06747	[0.84954]
SIZE(-1)	-3.70701	-1.37225	[-2.70141]	0.147043	-0.67775	[0.21696]
SIZE(-2)	3.153372	-1.37083	[2.30034]	-0.40979	-0.67705	[-0.60527]
PB(-1)	0.068039	-0.07873	[0.86418]	-0.00682	-0.03889	[-0.17534]
PB(-2)	-0.0565	-0.07832	[-0.72135]	-0.01595	-0.03868	[-0.41231]
C	11.22266	-1.24488	[9.01508]	3.03695	-0.61484	[4.93942]
R - squared		0.441018			0.972957	
Adj. *R* - squared		0.436486			0.972738	

Table 3. VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: VOLAT				Dependent variable: FII			
Excluded	**Chi-sq**	***Df***	**Prob.**	**Excluded**	**Chi-sq**	***df***	**Prob.**
FII	1.120538	2	0.5711	VOLAT	4.511054	2	0.1048
ILLIQ	51.52809	2	0	ILLIQ	8.865694	2	0.0119
PB	0.838252	2	0.6576	PB	3.276303	2	0.1943
PROM	0.574058	2	0.7505	PROM	2.144772	2	0.3422
R	36.09973	2	0	R	1.966097	2	0.3742
SIZE	33.72369	2	0	SIZE	25.90936	2	0
All	100.0603	12	0	All	85.60141	12	0

** Significant at 1% level
* Significant at 5% level

Conclusion

This paper deals with the association between stock's return volatility and their FII holdings. In this study, the results of multivariate regression show a positive and significant association between beginning of the quarter FII holdings and stock return volatility during the quarter. Bivariate causality analysis indicates a one way causal influence from volatility to two period lagged FII holdings. Results of a vector autoregression and block exogeneity test, including contemporaneous and lagged values of other potentially influencing variables, provide evidence of absence of any causality from FII holdings to volatility and vice versa. However, the included variables together cause FII holdings and also volatility. In the bivariate causality test, the influence of the other variables went undetected, giving a notion that volatility causes lagged FII holdings.

Thus, the findings of our work do not support the conclusion of previous works. Previous theoretical and empirical studies provide arguments for both positive and negative association of volatility with institutional holdings. However, the difference between the sample characteristics may be responsible for the disagreement as most of the previous studies were on the developed economies. In the context of emerging markets, working on Taiwanese stocks between 1994 and 2001, Huang and Shiu (2005) provided evidence that institutional investors may promote international standards of accountability, improve price discovery, and reduce stock volatility. Wang (2007), working on Indonesian and Thai stocks between 1996 and 1999, found that foreign trading has a dominating effect on local market volatility. However, our findings are based on an Indian data set representing a period (between 2004 and 2013) characterized by manifold increase in FII holdings in emerging economy stocks, and a much greater integrated world economy.

Foreign institutional investors' program trading, trading in larger volumes, and faster incorporation of information into prices induces greater volatility. But their better monitoring skills, greater analyst following due to their presence, reduced information asymmetry, and increase in information content of prices, that is, better price discovery, may lead to greater investor confidence and calm down the volatility. As a result, FII holdings may not have any significant effect on return volatility in the Indian stock markets.

Research Implications, Limitations of the Study, and Scope for Further Research

The growing importance of FIIs and the problems associated with their presence in a firm's capital structure have made the nature and causation of FII stocks and flows a subject of many studies. A proper understanding of the nature and determinants of the presence of FIIs in a firm's capital is essential for a meaningful debate about their effects - significant spikes in returns and volume, liquidity crisis, and drop in market efficiency in price discovery,

even in the absence of substantial fundamental shocks, as well as for predicting the chances of their sudden flow reversals. As FII holdings in Indian companies are extracted from quarterly financial statements, unavailability of firm specific FII data for intervals shorter than a quarter hinders the present study to some extent.

A logical extension of this paper would be an analysis of the effect of FII holdings on option implied volatility and vice versa, and its implication for domestic institutional and individual investors, as volatility expectations of investors about returns on stocks with high FII concentration may generate clues about future FII movements.

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Appendix 1

List of Sample 46 Companies Considered for the Analysis

A C C Ltd.	Hindalco Industries Ltd.	Punjab National Bank
Ambuja Cements Ltd.	Hindustan Unilever Ltd.	Ranbaxy Laboratories Ltd.
Asian Paints Ltd.	HDFC Ltd.	Reliance Industries Ltd.
Axis Bank Ltd.	I C I C I Bank Ltd.	Reliance Infrastructure Ltd.
Bank of Baroda	I D F C Ltd.	Sesa Goa Ltd.
Bharat Heavy Electricals Ltd.	I T C Ltd.	Siemens Ltd.
Bharat Petroleum Corpn. Ltd.	Infosys Ltd.	State Bank of India
Bharti Airtel Ltd.	Jaiprakash Associates Ltd.	Sun Pharmaceutical Inds. Ltd.
Cairn India Ltd.	Jindal Steel & Power Ltd.	Tata Consultancy Services Ltd.
Cipla Ltd.	Kotak Mahindra Bank Ltd.	Tata Motors Ltd.
Dr. Reddy's Laboratories Ltd.	Larsen & Toubro Ltd.	Tata Power Co. Ltd.
G A I L (India) Ltd.	Lupin Ltd.	Tata Steel Ltd.
Grasim Industries Ltd.	Mahindra & Mahindra Ltd.	Ultratech Cement Ltd.
H C L Technologies Ltd.	Maruti Suzuki India Ltd.	Wipro Ltd.
H D F C Bank Ltd.	N T P C Ltd.	
Hero Motocorp Ltd.	Oil & Natural Gas Corpn. Ltd.	