Disclosure, Foreign Institutional Investment, and Volatility : A Study in the Indian Context

** Titas Bhattacharjee*
*** Suddhasanta De*

Abstract

With global financial integration, emerging markets have gradually become more attractive destinations for international investors who seek higher returns than their own developed markets while diversifying their risk. In India, since the middle of 2003, significant increase in the inflow of foreign institutional investments has made it the most important source of portfolio investment. The Indian business newspapers repeatedly point out that the actions of foreign investors have an impact on the movement of the share prices. However, previous literature (before 2003) on Indian data established that stock returns influence the movement of foreign institutional investment, and not vice versa. However, these studies looked at the period before 2003, and given the structural change in share prices and net foreign institutional investment flows since the middle of 2003, it would be sensible to re-examine their relationship using more recent data. Also, as equity markets gets stuck by weaknesses in transparency and information disclosure policies, its reliability is said to be improved by raising firms' disclosure. Hence, in this present study, using firm-level Indian data from 2001 to 2008, we show that both concurrent and lagged foreign institutional investment flows and voluntary disclosure are negatively related to returns volatility. Our empirical results are consistent with the previous literature. Supporting our speculation that institutions herd on disclosure quality (signals), we tried to find out whether the correlation between volatility and foreign institutional ownership is higher for firms with higher voluntary disclosure. At the end, we tried to find out the direction of relationship among all of these three variables, and attempted to see whether there exists any moderating or mediating effect of one variable over another on volatility. The results are robust to many control variables. We analyzed the annual reports of selected Indian listed companies in constructing firm-specific voluntary disclosure measures and used panel data for regression purposes.

Keywords: **foreign institutional investment, voluntary disclosure, volatility, India**
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In this study, we examine the combined impact of foreign institutional investors (FII) holdings and corporate voluntary disclosure on volatility, a proxy for information asymmetry component of cost of equity capital in the Indian context. Our analysis assesses the interaction between voluntary disclosure levels and FII holdings and their influence on stocks' volatility of returns. In that sense, this study tries to combine two streams of research that intend to explain variation in stock return volatility. The first stream deals with whether institutional ownership is associated with stock return volatility (Potter, 1992 ; Sias, 1996 ; Xu & Malkiel, 2003) whereas, the second stream focuses on how corporate disclosure policies influence stock return volatility (Kothari, Li, & Short, 2009 ; Leuz & Verrecchia, 2000).

There are both theoretical arguments and empirical evidences against these research streams. Researchers talk about institutional turnover, institutional sophistication, and institutional preference hypothesis while explaining the association between institutional ownership and stock return volatility. On the other hand, theory also argues that increased disclosure reduces information risk, and that results in lower volatility. The research issue is motivated by the global financial integration of India with the outside world, as a result of which, India became an attractive destination for developed countries' institutional investors looking for risk diversification. Along with that, India also experienced gradual improvement in the disclosure practices of corporates over the last decade. The country has seen progress on this account as a number of changes have been introduced in the near past in the legal arena. Furthermore, companies compete with an extensive amount of business information voluntarily to establish a competitive advantage in the capital market and leading corporate players started following comparable international practices on

** Assistant Professor,* Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur, FA 1, IIT Kharagpur, Dist. Midnapore - 721 302, West Bengal. E-mail : rudratitas@gmail.com, titas@iitkgp.ac.in
*** Doctoral Student,* University of Calcutta, A-6, New Garia Development Cooperative Housing, Kolkata - 94.
E-mail : suddhasanta@gmail.com

their own. Reporting information voluntarily has become a norm for them. In this scenario, we wanted to understand how these two issues jointly influence the capital market environment of India. We hypothesize that the two constructs, voluntary disclosure quality and FII ownership are likely to interact in influencing firms' information asymmetry component of costs of capital, which is proxied here by volatility. Specifically, we argue that increased voluntary disclosure lowers the information and estimation risk, which should be more useful to institutional owners preferring lower information risk, and hence volatility. Together, these factors that lower information risk and result in higher FII preference, direct us to hypothesize that increased voluntary disclosure levels and higher FII ownership will be associated with significantly lower volatility than if only greater FII ownership was present.

Our sample consisted of 42 firms of the BSE top 500 firms on the basis of their market capitalization after necessary screening. VDI (voluntary disclosure index) was developed as the corporate disclosure level. Two sets of analyses were done. First, a panel regression was run by regressing volatility on FII, VDI, and the interaction of the two measures. Second, a correlation analysis was done between FII and volatility, for both high and low disclosure firms.

When we regressed the volatility on FII and VDI (with other control variables), we found that though the volatility decreased with greater FII holdings and better voluntary disclosure, the relationships are not significant. However, when we included the interaction between the two measures, we found that stock return volatility showed a significant negative association only when both - better disclosure and increased FII holdings - take place. When we ran the correlation analysis separately for high and low disclosure firms, we saw that the negative correlation is more for low disclosure firms than for high disclosure firms. This is, we argued, due to the simultaneous effect of both institutional sophistication and institutional preference hypothesis that is explained later.

As our contribution, we confirm the prior hypothesis on institutional preference by showing that greater disclosure reduces the information risk and thus reduces the volatility which leads to high FII ownership. Also, we have shown how the two effects - institutional sophistication and institutional preference - play together in determining the relation between volatility and FII ownership for high and low disclosure firms. Our findings are based on the Indian context.

Review of Literature

Background Literature : In the previous studies, the concept of disclosure was operationalized by means of 'disclosure index,' quantifying the types of data disclosed by corporate borrowers deemed relevant to investors. Disclosure index is the measurement of level of reporting by a company. The model includes information on financial and nonfinancial matters related to the past, present, and future of the corporation that may be relevant to investment decision-making, and, which listed companies may or have to disclose. The indexes used in the previous studies were voluntary disclosure index (Barako, Hancock, & Izan, 2006), mandatory disclosure index (Hasan, Karim, & Quayes, 2008) and the combination of both (Kant, 2002), although most of the studies are on a voluntary disclosure index.

Information about a corporation can be disclosed to investors in several ways, but almost all of the previous researchers have identified annual reports as the principal communication device available to companies and thought that they should serve as a good proxy for the level of disclosure provided by any firm across all disclosure avenues (Botosan,1997 ; Patel & Dallas, 2002). Going by their logic, we also restrict our study on disclosure to annual reports only. In the previous studies, the items included in the disclosure index were selected on the basis of (mainly) the following criteria:-

- An extensive review of prior studies (Singhvi & Desai, 1971).
- Discussion with financial and accounting experts and analysts (Kant, 2002 ; Singhvi & Desai, 1971).
- In-depth study of the annual reports of the leading companies over the period of study (Ahmed, 2005 ; Kant, 2002).

Regarding the association between disclosure and stock return volatility, previous research works extensively studied that disclosures can have an effect on the firm's capital market environment, including the cost of capital and return volatility. Kothari et al. (2009) analyzed the impact of disclosures on the capital market environment as proxied for by the cost of capital, return volatility, and analyst forecast error dispersion. Their findings were based on all disclosures made by companies, analysts, and business articles available from over 400 content sources, for a sample of 887 companies in four industry sectors (Technology, Telecommunications, Pharmaceutical, and Financial) for the time period from 1996-2001. They found that unfavorable disclosures are associated with significant increases in the cost of capital, stock return volatility, and analysts' earnings forecast dispersion. As per Leuz and Verrecchia (2000),

firms with higher disclosure should enjoy economic benefits in the form of a lower information asymmetry component of the cost of capital. This is because higher disclosure reduces the possibility of information asymmetries arising between the firm and its shareholders, which in turn leads to lower costs of issuing capital. One of the proxies they used for the information asymmetry component is share price volatility.

Another stream of research on explaining stock return volatility talks about the association of institutional holdings with the same. Most of the previous works provide evidence that higher institutional ownership is associated with higher stock return volatility (Potter, 1992 ; Sias, 1996; Xu & Malkiel, 2003). Dennis and Strickland (2002) showed evidence of institutions directly contributing to volatility. Bushee and Noe (2000) found that both levels of and changes in stock return volatility, measured both annually and around earnings announcements, appear to be partly driven by shifts in the composition of institutional investor holdings of firms. In particular, increased holdings by transient institutions are associated with subsequently heightened stock return volatility. Institutional turnover and institutional herding are the reasons for the positive effect of institutional ownership on volatility. Institutions herd because managers following a rational decision making process lead to institutions trade in a similar fashion and destabilize prices. Higher levels of institutional portfolio turnover than individual portfolio turnover due to higher levels of institutional ownership increase return volatility (Rubin & Smith, 2009). Karpoff (1987) provided evidence of a positive correlation between turnover and volatility. But still, there is enough justification to believe that volatility and the level of institutional ownership may be negatively correlated. Although institutions tend to destabilize prices by increasing turnover levels, there is evidence to believe of a negative association between higher levels of institutional ownership and volatility. Gompers and Metrick (2001) found a negative contemporaneous relationship between annual stock return volatility and institutional ownership. Institutions are generally better informed than individual investors. West (1988) documented evidence that an increase in the information content of prices reduces the stock return variance, that is, higher levels of institutional ownership is associated with more informative prices. Also, institutions prefer low volatility, indicating a negative correlation between institutional holdings and volatility. Rubin and Smith (2009) termed the first one as the institutional sophistication hypothesis and the latter effect as the institutional preference hypothesis.

The volatility increasing institutional turnover effect should be more for firms with high disclosure quality and the institutional sophistication effect and institutional preference for low volatility will be more for low disclosure quality firms. If institutions herd more to high disclosure quality firms than low disclosure quality firms, institutional ownership and volatility for high disclosure quality firms should have a less negative correlation than for low disclosure quality firms.

The interaction between institutional sophistication in pooling information, volatility aversion, and the effect of institutional turnover on volatility determines the relation between institutional ownership and volatility. Many studies have proven that institutional investors are more sophisticated and well informed than individual investors (Alangar, Bathala, & Rao, 1999 ; Bartov, Radhakrishnan, & Krinsky, 2000 ; Szewczyk, Tsetsekos, & Varma, 1992). Therefore, greater institutional ownership reduces information assessment errors (Sias, 1996), and indicates greater and more effective information gathering. The reason is greater information asymmetry for low disclosure quality firms and less information asymmetry for high disclosure quality firms. West (1988) found that more informative stock prices make returns less volatile. Therefore, higher levels of institutional ownership in low disclosure quality firms have greater effect on improving information and decreasing volatility. Negative correlation between institutional ownership and volatility caused by institutional risk aversion is greater for two main reasons. First, low disclosure quality stocks are significantly more volatile than high disclosure quality stocks. Second, institutional investors have a fiduciary responsibility towards their investors to avoid high volatility stocks and avoid investing in low disclosure stocks (Rubin & Smith, 2009).

Objectives of the Study

Previous research on disclosure suggests that higher disclosures reduce the volatility of stock returns by reducing the information asymmetry between firms and investors. Supported by previous research works, in this study, we focus on volatility as a proxy for information asymmetry component of cost of capital and by disclosure, we mean voluntary disclosure. Apart from voluntary disclosure, the construct with which we assume to have a joint association with volatility is FII. Greater disclosures should decrease information risk and transaction costs to investors, which in turn

lower the cost of equity capital and volatility and as explained above, institutional sophistication hypothesis and institutional preference hypothesis are the logic behind the negative association between firms' institutional ownership and return volatility. Hence, our research objectives in this paper are to find out whether volatility, the information asymmetry component of cost of capital, will be lower for (1) firms with high FII holdings, and for (2) firms with higher voluntary disclosure.

We predict that voluntary disclosure level and FII holdings will interact in their effect on volatility, with firms having both greater FII holdings and higher voluntary disclosure levels enjoying the greatest reductions in volatility. More specifically, the association of higher FII holdings with reduced volatility depends on whether there is a higher voluntary disclosure. If it is not so, then the effect will be insignificant. We believe that our study is the first to incorporate joint tests of these two constructs in the Indian context.

Data and Research Methodology

Sample Selection : Our analysis began with the top 500 companies on the basis of their market capitalization taken from the BT-500 list published by the magazine 'Business Today'. From this list of top 500 companies, banking and financial institutions were excluded as they prepare their annual reports according to their different statutes and specialized nature of operations and financial disclosures. After that, on the basis of the availability of the annual reports, the sample size got further reduced. Lastly, by taking the common companies from all the years of the study period, the final sample size came down to 42 companies. This was done to have a balanced panel data (a fixed sample over the study period) for the purpose of analysis. We identified the study period as of 8 years starting from 2001 to 2008.

Regression Model and Dependent and Independent Variable Definitions

Volatility (Volat) – Dependent Variable : It is measured by 365 days returns variance for each stock on each year as available in the Prowess database. After that, we take the natural log of that variance.

Development of Voluntary Disclosure Index (VDI) – Independent Variable : Voluntary disclosure index (VDI) was developed to measure the voluntary disclosure level of any company which is used in all the eight years of this study. The VDI is used as the explanatory variable in the regression analysis. The information contained or items included in the voluntary disclosure index were primarily selected on the basis of the review of literature on disclosure indexes developed by earlier researchers and also by thorough study of the annual reports of the companies. A total of 32 items have been included in the index. These 32 items have been grouped into two broad categories called financial information and non-financial information as disclosed in the Table 1.

Table 1: Classification of Voluntary Disclosure Index Items

	Broad Category	No. of items
A.	Financial information	9
B.	Non-financial Information	23
	Total	**32**

Source: Voluntary Disclosure Index (A complete voluntary disclosure index appears as Appendix 1)

The scoring of items in VDI has been made in the following way. If an information item of the disclosure index was disclosed in the annual report, full credit was given to the concerned company by awarding a score 1. On the other hand, if an item was found to remain undisclosed, the concerned company was penalized by awarding it a score of 0. However, in certain cases, there was variability in the amount of details disclosed by the companies in respect of some information items. In cases of such partial disclosure, partial credits were awarded. However, in all cases of partial rewarding, a consistency in the approach (i.e., for same amount of details presented by companies, awarding equal amount of score) was attempted for all the sample companies. We used 0, 0.5, and 1 to represent low, medium, and high disclosure to facilitate comparison of the disclosure quality across different items of the index. We could have used the ordinal integers 1, 2, and 3 to represent different degrees of disclosure, but comparisons would be more difficult to interpret. Sum of the obtained score for each item was converted into voluntary disclosure score as a whole for the

concerned company in the following way:

VDI = Total no. of items appearing in the annual report / 32

↳ **FII Ownership (FII) – Independent Variable :** Firms report FII ownership which is available from annual reports. FII ownership includes all shares held by non-residents, irrespective of where they are located. For each firm, the FII ownership as of the end of the financial year (which is generally March 31 for Indian firms) was taken.

↳ **The Model :** We used a panel data regression approach to examine the association between disclosure, FII, and volatility. In our analysis, we modelled the volatility as a function of FII ownership, voluntary disclosure index (VDI), and the interactions of the two, plus a number of control variables. We then estimated the following model with volatility specified as a linear function of our control variables and our variables of interest:

$$\text{Volatility}_{it} = \beta_0 + \sum_j \beta_j (\text{Control Variables}_{jit}) + \beta_7 VDI_{it} + \beta_g FII_{it} + \beta_9 VDI_{it} \times FII_{it} + \text{year dummies} + \varepsilon_{it}$$

where j = 1, 2,..., 6, it denotes observations on control variables for firm i on year t, VDI_{it} indicates the voluntary disclosure score defined above, FII_{it} represents the variable foreign institutional ownership defined above, the βs represent parameters to be estimated, and ε_{it} represents the error term. Apart from that, since our data set consists of both space as well as time dimensions, hence we allowed for time effect on account of factors like share prices, tax policies, and other external effects which shift over time. Hence, such time effect(s) have been considered in the analysis by introducing time dummies, one for each year. The control variables represent the variables that have been identified in prior literature as being associated with the dependent variable volatility. The model tests if the FII holdings or the voluntary disclosure score are individually or jointly associated with the volatility, and whether the two variables interact in their effect on the volatility. Our inferences lead us to expect negative signs on β_7, β_8, and β_9.

Control Variable Definitions and Measurements

We incorporated six control variables that have been identified in prior literature as being associated with volatility. These are Firm Size, Firm Leverage, Book-to-market Ratio, Return on Net Worth, Firm Age, and Trading Volume.

↳ **Firm Size (Size) :** This variable is the natural log of market value of the firm's shares at the end of each year. Prior research has documented that larger firms tend to have lower volatility (Bushee & Noe , 2000 ; Chang & Dong, 2006 ; Rubin & Smith, 2009). This suggests a negative association between Size and Volatility.

↳ **Financial Leverage (D/E) :** Prior studies use some measure of firm financial leverage as a control variable and generally document a positive association (e.g., Bushee & Noe, 2000 ; Rubin & Smith, 2009) with volatility. Higher Leverage suggests greater credit risk. We used the D/E ratio, as defined in the Prowess database, as a proxy for Financial Leverage. Consistent with prior research, we expected to observe a positive association.

↳ **Book- to- Market Ratio (B/M) :** We measured B/M as the book value of equity divided by the market value of equity at the end of every year. Prior research suggests that firms with fewer growth opportunities will have a higher volatility (e.g., Bushee & Noe, 2000 ; Kothari et al., 2009). Therefore, we expected to observe a positive coefficient on BM.

↳ **Return on Net Worth (RONW)** : Previous research works (Rubin & Smith, 2009) included ROE as one of the control variables for volatility. Following that, we used the variable RONW as our control variable and measurement is as available in the Prowess database.

↳ **Firm Age (Age) :** Age is another control variable as per prior research (Rubin & Smith, 2009) and here, it is defined as the natural log of the number of years since the firm has been incorporated. As younger firms are associated with "more uncertainty about long-run prospects," they can be expected to have higher volatility. Hence, a negative association between Firm Age and Volatility can be expected.

↳ **Trading Volume (TVOL) :** TVOL is measured by the natural logarithm of the average of the daily turnover ratio (i.e., daily trading volume divided by shares outstanding) of each firm for each year. According to prior research (Bushee & Noe , 2000 ; Chang & Dong, 2006), we can expect a positive association between TVOL and Volatility, that are

included in our model as one of the control variables.

Results and Discussion

Descriptive Statistics : Table 2 reports descriptive statistics for FII, VDI, and other variables for our 42 sample firms for eight years. The mean (median) FII for the sample firms shows an increasing trend with mean (median) of 9.26 (8.52) in 2001 and 14.68 (12.98) in 2008. The mean (median) VDI score also ranges from 5.55 (5) to 8.98 (9.5) from 2001 to 2008. The Table 2 also reports statistics for the volatility and selected firm-specific control variables. The VOLAT row reports a mean (median) volatility of 2.53 (2.58) in 2001 and 2.06 (1.95) in 2008, showing a decreasing trend over the study period. Among other variables, Size shows an increasing trend, and B/M and TVOL show a decreasing trend over the study period.

Correlation Analysis : Table 3 reports the results of our correlation analyses of the FII, VDI, Volatility, and the Firm

Table 2 : Descriptive Statistics

Variables	Stat.	2001	2002	2003	2004	2005	2006	2007	2008
VOLAT	mean	2.532	2.196	1.658	2.050	1.780	1.467	1.950	2.064
	median	2.579	2.166	1.791	2.031	1.730	1.401	1.918	1.949
	sd	0.523	0.688	0.765	0.546	0.496	0.380	0.433	0.497
	min	3.618	3.651	2.924	3.045	2.636	2.465	2.843	3.576
	max	1.348	0.445	-0.446	0.811	0.565	0.770	1.197	1.131
VDI	mean	5.554	6.244	6.905	6.857	7.333	7.494	8.101	8.976
	median	5.000	6.125	6.625	6.750	7.375	7.750	7.750	9.500
	sd	2.458	2.600	3.170	3.056	3.153	3.019	3.393	3.409
	min	1.750	1.750	1.750	0.500	0.500	1.000	1.250	1.750
	max	15.500	14.750	18.000	18.250	18.000	17.250	18.250	18.750
FII	mean	9.259	9.160	8.045	11.398	14.177	16.574	16.279	14.684
	median	8.515	6.720	5.240	10.585	13.300	15.770	14.535	12.975
	sd	8.144	9.411	9.660	10.762	11.489	10.362	10.117	9.358
	min	0.010	0.010	0.010	0.020	0.120	3.310	3.130	0.440
	max	33.760	37.670	43.020	51.270	56.060	52.480	47.220	48.220
Size	mean	6.852	6.940	6.899	7.626	8.034	8.738	8.787	8.882
	median	6.642	6.842	6.872	7.504	7.756	8.474	8.479	8.719
	sd	1.696	1.683	1.633	1.586	1.364	1.324	1.405	1.540
	min	10.626	10.585	10.561	11.227	11.240	11.617	12.158	12.704
	max	3.719	4.144	3.995	4.665	6.043	6.378	6.363	6.197
D/E	mean	0.664	0.861	0.897	0.717	0.734	0.766	0.717	0.768
	median	0.530	0.585	0.570	0.490	0.650	0.660	0.505	0.450
	sd	0.664	1.060	1.321	0.820	0.712	0.807	0.793	0.850
	min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	max	3.000	4.750	7.940	3.390	2.750	4.140	3.420	2.980
B/M	mean	1.160	1.163	1.038	0.505	0.363	0.241	0.304	0.333
	median	0.764	0.676	0.742	0.369	0.342	0.189	0.196	0.257
	sd	1.082	1.294	0.938	0.459	0.265	0.244	0.284	0.213
	min	0.047	0.064	0.107	0.080	0.078	0.046	0.027	0.031
	max	4.000	7.143	4.545	2.564	1.538	1.493	1.563	0.855
RONW	mean	19.452	16.957	16.757	18.156	21.424	23.530	28.740	25.320
	median	12.850	11.630	12.085	14.940	19.170	22.790	25.240	25.975

	sd	17.144	17.031	15.786	14.764	13.367	13.263	21.333	17.148
	min	-3.640	-24.030	-20.540	-3.410	1.350	2.710	-0.310	-1.280
	max	83.840	70.520	75.570	72.920	61.710	56.920	133.410	97.690
Age	mean	3.492	3.530	3.565	3.598	3.630	3.661	3.691	3.719
	median	3.609	3.636	3.662	3.688	3.712	3.737	3.760	3.783
	sd	0.668	0.642	0.619	0.598	0.579	0.561	0.544	0.529
	min	4.644	4.654	4.663	4.673	4.682	4.691	4.700	4.710
	max	2.079	2.197	2.303	2.398	2.485	2.565	2.639	2.708
TVOL	mean	-6.504	-7.141	-7.200	-6.698	-6.711	-6.668	-7.061	-7.211
	median	-6.147	-7.131	-7.184	-6.713	-6.840	-6.810	-7.184	-7.257
	sd	1.779	1.642	1.490	1.140	0.993	0.895	0.886	0.993
	min	-10.969	-10.704	-10.180	-8.821	-8.671	-8.401	-8.561	-8.742
	max	-1.919	-3.473	-3.135	-3.819	-4.670	-4.166	-4.600	-4.050

Source: Compiled by the Authors

characteristics. FII and VDI are positively and significantly associated with each other. Both FII and VDI are negatively and significantly associated with VOLAT. With respect to the volatility and firm characteristics, we found that, as predicted, VOLAT is positively related to Leverage, Book-to-Market Ratio, and Trading volume, and is negatively related to Firm Size and Firm Age and the relationships are significant.

Table 3 : Correlation Coefficients

	VOLAT	VDI	FII	Size	B/M	D/E	RONW	Age	TVOL
VOLAT	1.000								
VDI	-0.228	1.000							
	(0.00)*								
FII	-0.228	0.428	1.000						
	(0.00)*	(0.00)*							
Size	-0.359	0.537	0.562	1.000					
	(0.00)*	(0.00)*	(0.00)*						
B/M	0.264	-0.297	-0.359	-0.564	1.000				
	(0.00)*	(0.00)*	(0.00)*	(0.00)*					
D/E	0.260	-0.095	-0.250	-0.262	0.277	1.000			
	(0.00)*	0.082	(0.00)*	(0.00)*	(0.00)*				
RONW	-0.094	0.146	0.298	0.445	-0.508	-0.247	1.000		
	0.086	(0.007)*	(0.00)*	(0.00)*	(0.00)*	(0.00)*			
Age	-0.326	0.145	-0.112	0.215	-0.017	-0.074	-0.054	1.000	
	(0.00)*	(0.007)*	(0.041)*	(0.00)*	0.758	0.176	0.327		
TVOL	0.331	0.083	0.193	0.162	-0.189	0.029	0.084	-0.023	1.000
	(0.00)*	0.129	(0.00)*	(0.003)*	(0.00)*	0.593	0.123	0.678	

*, Significant at 5% level

Source: Compiled by the Authors

↳ **Regression Results :** Consistent with prior literature, we predicted that the volatility will be lower for firms with higher FII and with higher disclosure scores. We tested our predictions using panel data regression. The panel data comprises of 336 data points, and it is a balanced panel. We performed both fixed effects and random effects regressions. Next, by conducting the Hausman Test, we decided to use random effects regression for our model.

The Table 4 presents the results of our analyses. With respect to the control variables, TVOL and D/E are positively and significantly associated with volatility, and on the other hand, Firm Age and Size are negatively and significantly associated with the same. Each of these associations is as expected. Only B/M has insignificantly positive coefficients.

With respect to our variables of interest, when we included only one of our two independent variables in the model (Columns 1 and 2 in Table 3), we found that, as expected, FII and VDI are individually negatively associated with the volatility, but the coefficients are not significant (one-tailed $p = 0.17$ and $p = 0.29$, respectively). Similarly, when both FII and VDI were included in the model (Column 3), both are negatively but again insignificantly associated with the volatility at one-tailed p -values of 0.2 or more. In column 4, when the interaction between the two measures was included, both FII and VDI drop from significance further, and more specifically, they carry positive signs. However, only the interaction term involving FII × VDI is negatively and significantly associated with volatility (one-tailed p-value = 0.034). This suggests that, consistent with our expectations, when FII stands as a separate variable, due to simultaneous playing of institutional sophistication and institutional preference hypothesis in one direction and institution turnover effect in another direction, though the FII shows a negative association with volatility, it is not coming to be significant. However, when the interaction term FII × VDI is included, its coefficient becomes significantly negative as higher VDI leads to lower volatility and having confidence in that negative relation between VDI and volatility, FII also prefers those lower volatile stocks as per institutional preference hypothesis. Consistent with our predictions, it shows that firms with both - greater disclosure level and higher FII holdings experience significantly lower volatility relative to the other firms. This confirms that the significant negative association of FII with volatility does not occur individually, but occurs only in the presence of a good disclosure level.

Table 4: Regression Analysis

	Model with FII only	Model with VDI only	Model with FII and VDI	Model with FII, VDI and interaction
Intercept	5.239 (0.000)*	5.226 (0.000)*	5.248 (0.000)	5.134 (0.000)*
Size	-0.086 (0.014)*	-0.087 (0.016)*	-0.078 (0.037)*	-0.075 (0.042)*
TVOL	0.184 (0.000)*	0.181 (0.000)*	0.183 (0.000)*	0.182 (0.000)*
B/M	0.030 (0.505)	0.025 (0.569)	0.030 (0.504)	0.046 (0.300)
D/E	0.050 (0.032)*	0.056 (0.015)*	0.050 (0.034)*	0.051 (0.029)*
RONW	0.003 (0.010)*	0.003 (0.014)*	0.003 (0.016)*	0.003 (0.044)*
Age	-0.309 (0.000)*	-0.296 (0.000)*	-0.310 (0.000)*	-0.328 (0.000)*
Year Dummies	Included	Included	Included	Included
FII	**-0.005 (0.170)***		**-0.004 (0.246)**	**0.009 (0.246)**
VDI		**-0.013 (0.289)**	**-0.010 (0.423)**	**0.011 (0.513)**
FII × VDI				**-0.002 (0.034)***

*, Significant at 5% level

Source: Compiled by the Authors

↳ **Correlation Between FII and Volatility for High and Low Disclosure Firms :** After showing the role of disclosure in making a negative significant association between FII and volatility, we further explored how this relationship varies with higher and lower disclosure firms. On the basis of voluntary disclosure level, we subdivided our sample into top 25% firms and bottom 25% firms to see the correlation between FII and volatility for these two categories of firms, which are reported in Table 5a and Table 5b respectively. As per our research prediction, we found that the negative correlation between FII and volatility is more and significant for low disclosure quality firms, but less and insignificant in high disclosure firms. Accordingly, we can argue that in case of low disclosure firms, both institution sophistication and institution preference hypothesis leads to such a result. However, as in high disclosure firms, volatility is less and institutions do not enjoy much information advantage than others; here, only institutions' preference for the low volatility hypothesis exists and not the institution sophistication hypothesis, which results in less negative correlation between FII and volatility than low disclosure firms.

Table 5a: Correlation Coefficients for Top 25% Firms		
	VOLAT	FII
VOLAT	1.000	
FII	-0.084 (-0.445)	1.000
*, Significant at 5% level Source : Compiled by the Authors		

Table 5b: Correlation Coefficients for Bottom 25% Firms		
	VOLAT	FII
VOLAT	1.000	
FII	-0.265 (0.013)*	1.000
*, Significant at 5% level		
Source : Compiled by the Authors		

Conclusion

This paper deals with the association between stocks' return volatility, their FII holdings, and their quality of voluntary disclosures. Theoretical and empirical studies give an argument for both positive and negative association of volatility with institutional holdings. Theory and empirical evidence also suggest that greater financial disclosure levels should reduce firms' return volatility. In this study, we further predict that the two variables FII and VDI will interact to have a significant impact on stocks' return volatility. The disclosure quality proxy, VDI, used here is also developed in this study.

Our contribution to the accounting and finance literature is as follows. Firstly, we have constructed the disclosure quality proxy VDI to measure the voluntary disclosure quality of Indian corporates. Secondly, as predicted, we have demonstrated that disclosure level and foreign institutional holdings significantly interact to reduce volatility. Particularly, it was found that the negative association of FII ownership with volatility depends upon the extent of voluntary disclosure level of the firm. Stocks will have low return volatility when there is an existence of both greater FII holdings and high levels of disclosure, while they will experience no significant reduction of volatility by going for higher FII holdings only if they also have decreased levels of voluntary disclosure.

Research Implications

Volatility in stock markets is a concern among finance professionals, traders, investors, and anyone else having an interest in the stock market situation. Among the various ways of reducing volatility, disclosure and foreign institutional holdings have been stated as two factors that reduce such volatility in existing literature. In the literature, the individual impact of disclosure and foreign institutional holdings on stock market volatility have already been studied. Whereas in our study, the combined effect of disclosure and FII holdings have been studied. The major policy level implication of our research is that, higher FII holdings in any company can bring its market volatility down only if the company has a good voluntary disclosure of information at the same time. Similarly, if the information disclosed by any company is of poor quality, even if the FII holdings are higher, the volatility of its stocks cannot be reduced. Hence, policymakers need to come up with regulations ensuring better disclosure.

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Appendix 1: Voluntary Disclosure Index

I] Financial Data

1. Summary of financial results
2. The financial highlights for a number of years
3. Statement of sources and application of funds
4. Value added Statement
5. Economic Value Added (EVA)
6. Brand Valuation
7. Human resources Valuation
8. Current-cost statement
9. Key Ratios

II] Non-Financial Data

1. Chairman's Statement / MD's Report
2. Business Mission, Plans, Policies, and Strategies
3. Ethics policy / Value System
4. Brief history of the company
5. Organization Chart / Structure
6. Description of principal plants
7. Discussion of marketing networks for finished goods
8. Market Share Analysis
9. Order backlog
10. Unit Sales
11. Information Technology efforts and initiatives
12. The country / world economy
13. Quality Management Policy and Strategy
14. Explanations of factors responsible for variations in performance
15. Important events of the year
16. List of Directors or Managers
17. List of largest shareholders
18. Voluntary adoption of accounting standard
19. Functional classification of employees
20. Knowledge management strategies
21. Working environment and safety
22. Attrition Rates
23. Corporate Social Responsibility

Appendix 2 : List of 42 Sample Companies Considered for the Analysis

Apollo Hospitals Enterprise Ltd.	Hindalco Industries Ltd.	Sterlite Industries (India) Ltd.
Ashok Leyland Ltd	Hotel Leela Venture Ltd.	Sun Pharmaceutical Inds. Ltd.
Asian Hotels Ltd.	Infosys Technologies Ltd.	Tata Chemicals Ltd.
Asian Paints Ltd.	I T C Ltd.	Tata Elxsi Ltd.
Ballarpur Industries Ltd.	Larsen & Toubro Ltd.	Tata Power Co. Ltd.
Bharat Forge Ltd.	Mahindra & Mahindra Ltd.	Tata Tea Ltd.
Britannia Industries Ltd.	Nagarjuna Fertilizers & Chemicals Ltd.	Thermax Ltd.
Century Textiles & Inds. Ltd.	Orchid Chemicals & Pharmaceuticals Ltd.	Titan Industries Ltd.
Cipla Ltd.	Panacea Biotec Ltd.	Torrent Pharmaceuticals Ltd.
Colgate-Palmolive (India) Ltd.	Pidilite Industries Ltd.	Trent Ltd.
Cummins India Ltd.	Polaris Software Lab Ltd.	Tube Investments Of India Ltd.
Dr. Reddy's Laboratories Ltd.	Punjab Tractors Ltd. [Merged]	Unitech Ltd.
Grasim Industries Ltd.	Reliance Industries Ltd.	Voltas Ltd.
Hero Honda Motors Ltd.	Satyam Computer Services Ltd.	Wipro Ltd.