An Analysis of Long-Term Impact of Volatility in Trading of FIIs and DIIs: Evidence from NSE and BSE

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Abstract

Purpose: The purpose of this research is to study the effect of the trading activities of FIIs and DIIs on the Nifty Index and BSE Sensex. This study also examined the long-term relationship among the above-mentioned variables.

Design/Methodology/Approach: We used secondary data of the Nifty index, BSE Sensex, FIIs (net purchases/sales), and DIIs (net purchases/sales) in the current study. This data was collected for the period January 1st, 2021, to December 31st, 2024. E-views, SPSS, and M S Excel have been applied to conduct this research. The long-term association between the variables has been examined here using ARDL. The direction and degree of correlations between the variables were examined using correlation and R-squared.

Result: Long-term cointegration has been found among the variables. The correlation is showing that FIIs' net trading has a negative impact on the Nifty index as well as the BSE Sensex, while DIIs have a high positive impact on the Nifty index and the BSE Sensex. FIIs and DIIs trading is not affecting more than 3% of the Nifty Index and the BSE Sensex.

Originality/value: This paper will be useful for the traders and investors who follow FIIs and DIIs trading patterns while taking investment-related decisions in the stock market. At the time of implementing any foreign policy, the Government also keeps a sharp eye on FIIs' investment in the stock market.

Keywords: FIIs, DIIs, ARDL, R-squared, Volatility, Correlation

JEL: G11, G17, G12

Introduction

Foreign investment is the term used to describe capital flows from one nation to another. Foreign investment in listed firms on the stock market is known as Foreign Institutional Investors (FII) investment. FIIs' investment has a more indirect impact on growth by enhancing the host nation's equity market performance. Capital flows from FIIs are frequently seen as having two sides. Firstly, investing in the stock

market, FIIs boost the economy, while on the other hand, these can improve the capital structure of the companies they are investing in. Domestic institutional investors also invest a huge amount in the stock market, so both are called the pillars of the stock market.

Generally, investors and traders focus on the shares being traded by FIIs and DIIs, with the expectation of more potential in these securities. These FIIs invest in the Indian stock market to earn a higher return. But their trading is influenced by the internal and external economic conditions of their parent country and the country where they are going to invest. Trading of FIIs and DIIs can change the mood of the securities market.

Short-term expectations for a return cause FII capital flows to become highly mobile and speculative, which increases the host country's stock market's volatility. Small investors are gravely concerned in this situation about whether prices adequately reflect their expectations of present worth. Volatility is a sign of a highly liquid market and is liked by market participants, but this volatility must be limited because extreme volatility may cause a high loss in the worth of investors. Volatility brought on by the flow of FII money is bad for stock markets and investors.

In the last two decades, stock market volatility has been a significant source of worry for academics, investors, and policymakers all around the world. The behavior of share prices in India has been greatly influenced by recent financial innovations and regulatory and non-regulatory reforms. High volatility was the outcome of the market structure being impacted by both the new participants and the new market environment. Several factors, including macroeconomic indicators and the actions of foreign and domestic institutional investors, contribute to national market volatility. If the national market is connected to the global market, then global forces and local market impacts both contribute to national market volatility. Additionally, it makes sense that, as market integration increases, global issues may affect volatility more strongly. Research has also indicated that initiatives for liberalizing capital markets may have an impact on volatility. The fact that there is a positive association between the two in the case of some nations would be interesting to policymakers.

Literature Review

Dhananjaya and Krishna Raj (2017) stated that the flows of FIIs and DIIs were discovered to be in direct opposition to one another. Compared to DIIs, the percentage of FIIs in the entire stock market turnover has increased. In particular, during economic crises, there is a need to build and strengthen DIIs so they can serve as a buffer against FIIs' rapid withdrawal. Aashish Jain (2022) assessed on a daily basis how the Indian stock market behaved concerning institutional investors' inflows and outflows. The Nifty 50 index influences both FIIs and DIIs; however, the trading of FIIs is more influenced than that of DIIs, as per the outcomes of the VECM and Granger Causality tests (GCT).

Salar and Atif (2016) investigated the causal link between the BSE Sensex movement and investments made by domestic institutional investors. Granger causality and Vector Auto Regression (VAR) analysis revealed that while Dlls do not positively impact Sensex return, Sensex movement does affect Dlls' investment strategy. Foreign institutional investors may have a significant impact on the Sensex. Saluja & Totala (2018) looked at how the demonetization affected the relationship between institutional investors and the BSE SENSEX Index of the BSE. For both the year before and after demonetization, there was no discernible effect of DII's net trading and FII's net trading on the SENSEX. Therefore, it can be said that SENSEX was unaffected by the demonetization in any way. Chhimwal & Bapat(2020) examined the investment practices of retail investors, DIIs, and foreign portfolio investors in the Indian market. Based on historical results, it has been noted that whereas ordinary investors exhibit contrarian behavior, FIIs and DIIs exhibit momentum behavior in the short term of the market. Additionally, it has been discovered that retail investors behave more conflicting when investing in former losers. Sathish & Srinivasan (2018) examined institutional investors' actions both before and after the demonetization of the Indian stock market. Basic statistical approaches were used to analyze the gross purchases and gross sales of DIIs and FIIs. The study did not uncover any convincing evidence of the influence of demonization on institutional investors' behavior. Hajam & Shafi (2021) tried to analyze how FIIs

might affect the Indian stock market. The data was processed using correlation and regression econometric techniques. Except for a few years, it was discovered that FIIs always exhibited a favorable trend towards India. The current study's analysis shows a modestly favorable link between net FIIs investments and the NSE Nifty. The FIIs' inflows and outflows have a considerable impact on the NSE Nifty index of the Indian stock market, according to regression research. Sunaina & Deepti (2020) looked into how the stock market was affected by herd behavior. Using the CSAD approach, the effect of herd behavior was quantified. The study's findings refute all alternative hypotheses that were developed for the study's objectives. This demonstrates unequivocally that there is no evidence of herding in any market circumstance, which may be related to the fact that the Indian stock market is predominantly dominated by financial institutional investors. Damle & Basu (2020) analyzed the effects of the U.S.'s unorthodox monetary policy on institutional investment flows in India. They examined how institutional investor flows and market returns related before, during, and after the U.S. quantitative easing phase and discovered. FII's flows and market returns are causally related, according to Granger. This suggests that over the quantitative easing period, foreign institutional investors have gained more benefits in India's stock market, taking domestic institutional investors' influence away.

Objectives of the Study

- To check the stationarity of all the variables
- To check the Cointegration among the variables.
- To research the effects of DIIs' and FIIs' trading on the NSE.

Research Methodology

In our current research, which is analytical and descriptive in nature, we used secondary data. The data for the study was collected from trustworthy database platforms such as moneycontrol.com, nseindia.com, and yahoofinance.com. The data of 992 trading days from January 1st, 2021, to December 31st, 2024, was considered in this research. E-views, SPSS, and MS Excel were used in this research. Unit Root Test, Autoregressive Distributed Lag (ARDL), Descriptive Analysis, Correlation, and R2 were employed in this study's statistical analysis.

Hypothesis

H01: Unit root exists among the variables.

H02: No long-term relationship exists among the discussed variables.

H03: There is no high impact of FIIs and DIIs trading on the Nifty 50 index and the BSE Sensex

H04: There is no significant difference in the mean values of all the variables.

Analysis

Unit Root: It was applied to check the stationarity of all four variables. Here, the raw data at the level was used to check the unit root. In Table 1 below, the probabilities of FIIs and DIIs are less than 0.05, indicating the stationarity of these variables. The remaining two variables have probabilities greater than 0.05, indicating non-stationarity. So, our hypothesis is accepted about the unit root in the variables.

Table 1. Unit Root Test (Level)

Null Hypothesis is: Unit root (individual unit root process)
Series: FIIs, NIFTY_INDEX_CLOSING, DIIs, BSE_SENSEX

Method	Statistics	Probabilities
ADF - Fisher Chi-square	107.504	0.0000
ADF – Choi Z-stat	-5.80035	0.0000

Results of the ADF test.

Series	Prob.	Lag	Max Lag	Obs.
FIIS	0.0000	3	21	987
NIFTY_INDEX_DIIS	0.8667	0	21	990
DIIS	0.0000	3	21	987
BSE__SENSEX	0.8527	0	21	990

As above, the ADF test shows two stationary and two non-stationary variables at the level. We converted the variables at first difference and found all the probabilities were less than 0.05, justifying the stationarity of all the variables, which has been displayed in Table 2.

Table 2. (At First Difference)

Null Hypothesis is: Unit root (individual unit root process)
Series: FIIs, NIFTY_INDEX_CLOSING, DIIs, BSE_SENSEX
Augmented Dickey–Fuller test

Method	Statistics	Prob.
ADF - Fisher Chi-square	648.340	0.0000
ADF – Choi Z-stat	-24.8702	0.0000

Results of ADF test with D (UNTITLED)

Series	Prob.	Lag	Max Lag	Obs.
D(FIIS)	0.0000	0	21	989
D(NIFTY_INDEX_DIIS)	0.0000	7	21	982
D(DIIS)	0.0000	4	21	985
D(BSE__SENSEX)	0.0000	0	21	989

ARDL: It was applied to check the cointegration among the variables. This test is applied when a few variables are stationary at the level, while the rest are at the first difference. In Table 1, it can be seen that two variables, FIIs (Net Trading) and DIIs (Net Trading), are stationary at level 1(0), while the Nifty index and BSE Sensex are stationary at the first difference, 1(1). But this test is not suitable if variables are stationary at 1(2), so here the ARDL or bound test will work, not the Johansen cointegration test. Here, the f-statistic value is compared with lower and upper bound values; if the value of the f-test is higher than the lower and upper bound values, a long-term relationship is expected; if the f-statistic value is lower than the lower and upper bound values, no long-term relationship is considered. In the tables 3(a) and 3(b) mentioned below, we can observe a long-term relationship between (1) the Nifty index and (FIIs and DIIs) and (2) the BSE Sensex & (FIIs and DIIs)

Table 3 (a) {Nifty and (FIIs and DIIs)}

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIIs	-18.72926	17.01040	-1.101048	0.2711
DIIs	-12.30660	11.93873	-1.030813	0.3029
C	8926.250	5200.019	1.716580	0.0864

EC = NIFTY_INDEX_CLOSING - (-18.7293*FIIS -12.3066*DIIS + 8926.2495)

F-Bounds Test		Null Hypothesis: No levels relationship			
			Asymptotic: n=1000		
Test Statistic	Value	Signif.	I(0)	I(1)	
F-statistic	18.64199	10%	2.63	3.35	Actual Sample Size 988
k	2	5%	3.1	3.87	
		2.50%	3.55	4.38	
		1%	4.13	5	Finite Sample: n=80
10%			2.713	3.453	
5%			3.235	4.053	
1%			4.358	5.393	

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(NIFTY_INDEX_CLOS.)	-0.134047	0.032817	-4.084738	0.0000
D(FIIs)	0.036295	0.002599	13.96359	0.0000
D(FIIs(-1))	0.006574	0.002592	2.536445	0.0114
D(DIIs)	0.007175	0.004658	1.540181	0.1238
D(DIIs(-1))	-0.006478	0.004848	-1.336156	0.1818
D(DIIs(-2))	-0.012842	0.004201	-3.057100	0.0023
CointEq(-1)*	0.001807	0.000209	8.648508	0.0000

Here we can observe that both the coefficients are negative. The F-stat value is 18.64199, which is higher than the lower and upper bands, so it can be justified that a long-term relationship exists between the Nifty index and FIIs and DIIs trading.

Table 3(b) {BSE Sensex and (FIIs and DIIs)}

Variable	Coefficient	Std. Error	t-Statistic	Probability
FIIs	-50.50878	41.02808	-1.231078	0.2186
DIIs	-25.92636	24.40417	-1.062374	0.2883
C	28724.14	16417.85	1.749567	0.0805

EC=BSE_SENSEX-(-50.5088*FIIs-25.9264*DIIs+ 28724.1360

F- Bounds Test **Null Hypothesis: No level relationships**

Test Statistic	Value	Signif.	I(0)	I(1)	
				Asymptotic: n=100	
F-statistic		14.45844	10%	2.63	3.35
k		2	5%	3.1	3.87
			2.5%	3.55	4.38
			1%	4.13	5

Test Statistic	Value	Signif.	I(0)	I(1)	
			Finite Sample: n=80		
Actual Sample Size	988		10%	2.713	3.453
			5%	3.235	4.053
			1%	4.358	5.393

ECM Regression

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Probability
D(BSE_SENSEX(-1))	-0.156188	0.032913	-4.745474	0.0000
D(BSE_SENSEX(-2))	-0.049743	0.032640	-1.523962	0.1278
D(FIIs)	0.108596	0.008849	12.27182	0.0000
D(FIIs(-1))	0.031405	0.011343	2.768624	0.0057
D(FIIs(-2))	0.016367	0.008805	1.858775	0.0634
D(DIIs)	-0.007449	0.015876	-0.469212	0.6390
D(DIIs(-1))	-0.043042	0.018061	-2.383079	0.0174
D(DIIs(-2))	-0.044509	0.015514	-2.868943	0.0042
CointEq(-1)*	0.002114	0.000278	7.616531	0.0000

Descriptive Analysis: Table No. 4 indicates that FIIs are more inclined towards sales in the stock market. It is shown that FIIs have negative net trading, whereas DIIs have positive net trading. DIIs, on the other hand, are keener on purchasing. Due to their higher standard deviation than their local counterparts, overseas institutional investors' trading patterns appear to be more volatile. In other words, more risk is involved with FIIs' investment activities than with DIIs. Positive skewness values of the Nifty50 index, BSE Sensex, FIIs, and DIIs, which specify that the left tail is spread out and the values are more concentrated on the right side.

Table 4. Descriptive Analysis

	FIIs (Net Trading)	DIIs(Net Trading)	Nifty Index closing	BSE Sensex
Mean	-267.335	380.5912	13961.99	46969.3
Standard Error	73.51606	46.84769	92.55464	306.589
Median	-247.01	259.46	13873.2	47353.75
Mode	-959.09	#N/A	10792.5	#N/A
Standard Deviation	2314.297	1474.773	2913.634	9651.47
Sample Variance	5355970	2174954	8489264	93150864
Kurtosis	30.31409	2.437258	-1.42424	-1.42075
Skewness	2.49742	0.634739	0.040144	0.043022
Range	37034.34	12908.37	11202.25	37302.95
Minimum	-8295.17	-5240.62	7610.25	25981.24
Maximum	28739.17	7667.75	18812.5	63284.19
Sum	-264929	377165.9	13836337	46546576
Count	991	991	991	991

Net Trading Net Purchase –Net Sale

Correlation: Simple correlation is employed to examine the relationship between two variables. While multiple correlation is examined in the case of more than two variables, in the current work, we sought to identify the connections between various variables. The Nifty index and FIIs net trading have a low degree of negative correlation in Table 5, whereas the Nifty index and DIIs net trading have a positive correlation. The same is true for the BSE Sensex. However, there is a strong negative correlation between FII and DII net trading.

Table 5. Correlation

	Nifty Index closing	BSE Sensex	DIIs (Net Trading)	FIIs (Net Trading)
FIIs (Net Trading)	-0.145301	-0.142488	-0.638521	1
DIIs(Net Trading)	0.166941	0.160740	1	- 0.638521

Coefficient of Determination & Multiple Determination (R2): Table 6 below indicates that FIIs' trading is 2.1% responsible for changing the value of the Nifty 50 index, while on the other end, DIIs' share is 2.8%. If we talk about the combined effect of FIIs and DIIs trading, it's around 3%. On the other hand, in the case of the BSE Sensex, FIIs and DIIs are individually affecting it by 2% and 2.5%, while combinedly, both are affecting the Sensex by 2.85%. We can observe that R2 is not so high in all the cases, which means other factors are more affecting the Nifty 50 index and the BSE Sensex.

Table 6. R^2

	R^2(FIIs)	R^2(DIIs)	R^2(FIIs & DIIs)
Nifty Index	0.021112	0.027869	0.030399
BSE Sensex	0.020303	0.025837	0.028519

Research Implications

FIIs and DIIs are called the pillars of the stock market. The paper will be helpful to make the investors aware of the impact of FIIs and DIIs trading on the Nifty Index and the BSE Sensex. This might make it easier for investors to select the shares where FIIs and DIIs are taking trades. Investors can focus on the buying patterns of FIIs and DIIs to invest in different scrips, while in the case of selling by FIIs and DIIs, they can avoid investing, but they can go with short selling.

Conclusion

The study reveals that, as per the ADF test, two variables, FIIs and DIIs, are stationary at the level (without difference), while the remaining two, the Nifty index and the BSE Sensex, are not, but at the first difference, both are. So the Autoregressive Distributed Lag Model (ARDL) was applied to check the cointegrating relationship among the variables, for a longer period. Bound test indicates that FII's and DII's net trading have a long-term relationship with the Nifty Index and the BSE Sensex. The study offers proof that both FIIs and DIIs have a high negative impact on one another, meaning if FIIs are buying or selling, DIIs are doing just the opposite. On the other hand, FII's net trading has a negative impact on the Nifty index as well as the BSE Sensex, while DII's net trading has a positive relationship with the Nifty index and the BSE Sensex. The study concludes that FIIs and DIIs trading is contributing only 2% to the Nifty index and 3% to the BSE Sensex separately, while combinedly, both the FIIs and DIIs are contributing around 3% to the NSE index and 2.85% to the BSE Sensex. It can be observed that R2 is not so high in all the cases, which means other factors are more affecting the Nifty 50 index and the BSE Sensex. In order to protect against FIIs' abrupt withdrawals, particularly during economic crises, we must grow and attract DIIs because we have observed a

positive correlation between DIIs and the Nifty index. On the other hand, developing DIIs, like mutual funds, will also help increase the indirect participation of small retail investors in the Indian stock market.

Scope for Further Research

In the current study, ARDL, correlation, and R-squared are significant factors to check the long-term impact of FIIs and DIIs trading on NSE as well as BSE. Investors are always keen to know where FIIs and DIIs are investing and the impact of their trading on the NSE index and the BSE Sensex. For conducting further research, different sectors and different indices of the NSE and BSE can be used, except that the Granger causality test can be applied to determine whether one time series is useful in forecasting another. Short-term relationships can also be determined by the researchers. Researchers can also use the F test to check whether the variances of the particular variables show a significant difference or not. In further research, MANOVA can be applied to determine whether the mean values of particular variables have a significant difference or not.

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