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A study on Investment Behavior of Foreign Institutional Investor with regard to NSE market capitalization and NSE trading volume

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Abstract

This paper investigates the relationship between NSE Market capitalization, NSE trading volume and foreign institutional investments in India using ARDL model for the period of April 2008 to March 2023 using monthly data. Through stock market, Foreign investors interact with the real economy, (Pal, 2010) so this effect of foreign investors via stock market on the country's economic development will also be examined. Variables are examined using ADF test and ARDL Model. ADF is used to check the stationarity of the variables and ADRL is used to determine the relationship between variables. The Granger causality test is also used to measure the causal relationship exists between variables. The study found that the NFII series is stationary at level while other two variables are stationary at first differencing. The ADRL model found that (a) Market capitalization has positive relation with trading activities of FIIs and NFII is affected by Market capitalization, (b) FII trading activities are not affected by trading volume of stock market. The findings indicate that the net FII flow and trading volume has no relationship while there is unidirectional causality between market capitalization and NFII.

Keywords: Market Capitalization, Trading volume, Investors, Granger, Return

1. Introduction

It has been decided by many emerging economies that they opened their capital markets for foreign investors in the late 1980s. Under this situation, the foreign investors are allowed for trading of domestic securities and rights has given to domestic investors in foreign market to hold issued shares (Nguyen & Bellalah, 2008). Now the prices are no longer set by the domestic investors as a whole after market liberalization and they become price followers. A significant change is represented by it between market volatility and trading activities in the underlying economic relationship (Wang, 2007). During the last decade there is a tremendous increase in the total stock market volume due to the share of foreign trading activities (Dvorak, 2000; Clark & Berko, 1997). Now it becomes easier, quicker and cheaper for the cross-border investment and economic operations than ever before. The global economy is expected to enter a new stage at the beginning of the 21st century, and emerging markets get a more rapid and dramatically flow by international capital. Usually a significant impact by foreign direct investment on economic development as well as investment in the country received by the employment is shown (Lin & Chen, 2006). Different characteristics and implications have been shown by foreign portfolio equity investment for developing countries as compared to foreign direct investment (FDI) (Bodla & Kumar, 2009).

Capital Markets has a crucial significance to capital formation as the mobilization of savings is the main function of these markets and for the industrial investment their distribution, thereby the capital formation is being stimulated and economic growth's process is accelerated to that extent. A significant role has been gained in Indian capital markets by the foreign institutional investors (Rastogi & Husain, 2015; Agarwal, 2016; Chakrabarti, 2001). A marked expansion is witnessed over the years by the foreign institutional investors' investments. FII investment at stock market achieved a higher degree of liquidity is expected, price-earning (PE) ratios is increased and consequently cost of capital for investment is reduced (Behera, 2012). Since 1992, FPI then has emerged in this country as a major source of private capital inflow (Pal, 2010). The flow of information has

influenced the fluctuations in stock market and trading volume (Mubarik & Javid, 2009). Investor to adapt their expectations due to arrival of new information and the main cause for price and return changes is this. The factors of the current stock market activity are trading volume and volatility on one hand and on other hand, for the future behavior of stock market it provides a potential source of information (Tripathy, 2010 and Mubarik & Javid, 2009). Investors should keep a close watch on the stock prices and the trading volume that are two vital pieces of information which is required for making investment in the stock market. A clear idea is given by both of these variables about the direction of stock prices (Bajaj, 2014 and Assan & Thomas, 2013). For various market players, Price-volume relationship can be a critical input (Assan & Thomas, 2013; Smirlock & Starks, 1988). Greater market capitalization of the firm is usually associated by the liquidity of a stock since a stock becomes more attractive by a larger market capitalization to a larger number of investors, the size of companies in which they invest have some limitations (Ding et al., 2013). The study's main focus is to explore the vast relationship between foreign institutional investment, trading volume and market capitalization. There is very little literature available regarding the Indian market to explore the link between foreign institutional investment, trading volume and market capitalization, this gap is filled by this study is tried by investigating the relationship between the foreign institutional investment, trading volume and market capitalization of NSE. Our paper is different from others in a number of ways. First, our data sample is different. Our data is of much higher frequency range from 2008 to 2023, month wise. Second, the paper has studied the relationship between NFII, trading volume and Market capitalization in the Indian context using the ARDL Model. The rest paper is divided as follows. Section 2 has description of Literature Review and Research Gap of the study. Section 3 describes the data used in our tests. Section 4 presents empirical results relating to net FII flows, trading volume and market capitalization. Finally a summary and conclusions is provided in section 5.

2. Literature Review and Research Gap

This chapter provides a brief review of the literature relating to FII flows, trading volume and market capitalization. Smirlock (1988), Lin & Chen (2006), Akin & Basti (2008) and Chae & Lewellen (2004) studied the relation between Stock Price and Trading Volume of the New York Stock exchange. Return and volume are the variables taken by Lamoureux & Lastrapes (1990), Mubarik & Javid (2009), Tripathy (2010), Choi et al. (2012), Darwish (2012), Assan & Thomas (2013), Alkhazali (2014), Bajaj (2014), Aljarayesh et al. (2018) and Dumitriu et al. (2011) using Arch, Garch model and Granger model. Sias (1996) used a Regression test to study the relation between Returns, Institutional holdings and market capitalization. Foreign equity investment, Market capitalization, Stock price Index, Stock returns, Short term interest rate, Dollar exchange rate, Volatility and Country risk are the major variables used to study the relationship using correlation (Clark & Berko, 1997) and found that there is strong correlation between inflows and price performance. Herding become weaker during the crisis period was the finding of Choe et al. (1998) when Relationship between Foreign ownership, Trading volume and Market returns was studied. Bushee & Noe (1999) used Stock Return, Trading volume, Beta, Risk,

Leverage, Earnings-price ratio, Book-price ratio, and Sales growth variables to find out the relationship using a regression model. Goetzmann & Massa (1999) used daily data for 1993-1999 using investor's inflows and outflows, returns, volatility, volume etc and the result shows that there is significant relationship between past returns and outflows whereas there is lack of relationship between returns and inflows, implied that there is asymmetric behavior by investors who react more quickly to bad news than good news. Exchange rate, Stock price, Transaction volume of KOSPI is used by Kim & Wei (1999) to find out the relationship between variables. Relationship between Market capitalization, GDP, Trading Volume and Turnover of 31 emerging countries was studied out by Errunza (2001) and found that correlation between MCAP to GDP and Trading to GDP is significant. Using regression model; relationship between Stock Returns, Short term Interest, S&P returns, Trading Volume are studied by Hamao & Mei (2001) and found that foreign investments are negatively related to past excess returns. Mukherjee et al. (2002) and Rastogi & Husain (2015) using daily data of stock market like Sensex, S&P 500, MSCI World Index used variables includes Exchange rates, short term interest rate, Index of industrial production, Market Returns, volatility, Market capitalization and FII flows. Ananthanarayanan et al. (2009) found that BSE returns are strongly correlated with contemporaneous net flows when FII flows, Market Returns and Market capitalization variables are used for study. Relationship between Market capitalization, Trading Volume and Net FII flow in Sensex has been studied by Bodla & Kumar (2009), Nguyen & Bellalah (2008).

The main focus of the study is to explore the dynamic relationship between foreign institutional investment, trading volume and market capitalization. There is very little literature available regarding the Indian market to explore the link between foreign institutional investment, trading volume and market capitalization, the current study fill this gap by investigating the relationship between the foreign institutional investment, trading volume and market capitalization of NSE.

3. Research Methodology and Dataset

We have considered a time period of 2008 to 2023 in our study. We have taken trading volume and market capitalization of NSE and the net foreign institutional investment (NFII). The monthly NFII has been taken from SEBI website (www.sebi.gov.in) where as monthly closing values of market capitalization and trading volume of NSE has retrieved from database CMIE PROWESS. We have taken data as financial year as the basis of our study. For the purpose of our analysis, we considered the closing values at the end of each month. The reason behind the selection of NSE's stock exchange is its amazing performance in the world along with this it is one of the largest stock exchange of India, and in terms of the trading volume in equity shares, it has been ranked first in the world. The descriptive statistics, ADRL model and granger causality test are used for analysis part.

4. Results and Interpretation

The section shows the result of descriptive statistics, ADRL model and granger causality test of Market capitalization, trading volume and Net foreign institutional investment.

Descriptive Statistics

The descriptive statistics of net FII flows, trading volume and market capitalization has been presented in this section in table no 1.

Table 1: Descriptive statistics of FII, Market Capitalization and Trading Volume

	NFII (Crores)	Mcap (Crores)	Trading Volume (Crores)
Mean	4024.146	7766349	355645.8
Median	4033.700	6530750	293829.0
Skewness	-0.896734	0.491082	1.716612
Kurtosis	8.536353	2.121988	8.053246
Jarque-Bera	254.0080	13.01664	279.9174
Probability	0.000000*	0.000000*	0.000000*

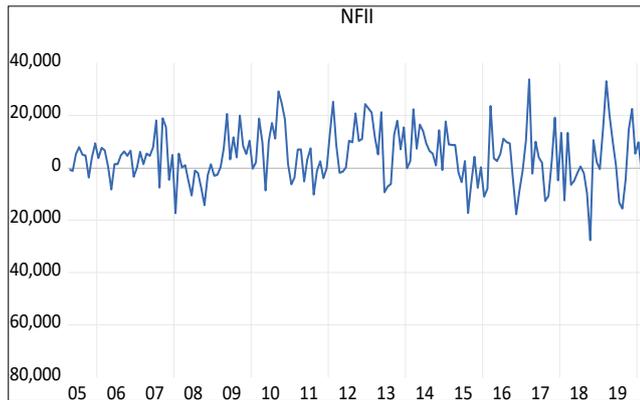
Source: Authors.

Note: * indicates significance at percent level

The mean value of NFII, Mcap, and trading volume is found to be slightly lower than the median value. The skewness of NFII is negatively skewed and it is positive of Mcap and trading volume. The level of significance of Jarque-Bera analysis for Mcap, NFII and trading value is less than 0.05 which shows that these variables are normally distributed.

Unit root test of FII (Test of Stationarity)

The time series data is graphically represented to show the normality of data in figure 1, 2 and Figure 3.



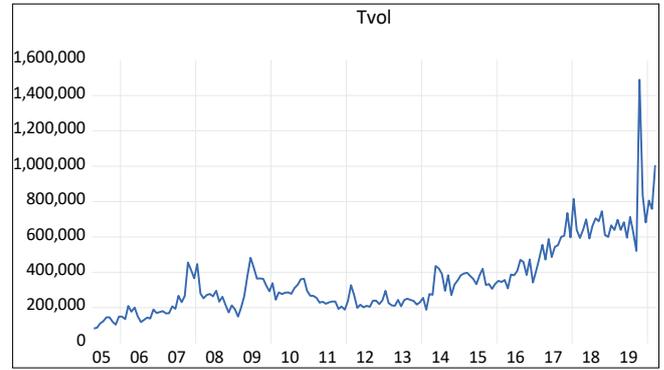
Source: EViews 11

Fig 1: Net Foreign Institutional Investments trends



Source: EViews 11

Fig 2: Market Capitalization trends



Source: EViews 11

Fig 3: Trading volume trends

Figure 1 shows that Net FII series is stationary while figure 2 and 3 shows that the Market capitalization and trading volume are non stationarity means having unit root test. In order to check the results, econometric stationarity test is applied. The most popular stationarity test is Augmented Dickey Fuller test and same is used to check the stationarity of data:

Table 2: ADF Unit Root Test

Variables	NFII	Mcap	p-value
Level	0.0000*	0.6151	0.8273
1 st Diff.		0.0000*	0.0000*

Source: Authors.

Note: * indicates significance at percent level

The above table concluded that the net foreign institutional investment is stationary at level while other two variables that are Market capitalization (Mcap) and trading volume (Tvol) are stationary at first differencing.

ARDL model

A detailed overview of the relationship between FII Trading volume and Market capitalization is given to study the influence of the FII flows to India. The dependent variable, FII, is taken as Net FII and the impact of the independent variables on each of them are studied separately. Therefore ARDL method is employed to understand the relationship between NFII, Trading volume and Market capitalization.

The generated regression equation of ARDL model is $NFII = \beta_1 + \beta_2 Mcap + \beta_3 Tvol$

Where NFII is net foreign institutional investment, Mcap is Market capitalization, Tvol is trading volume at NSE, β_1 is constant, and β_2 and β_3 are coefficient of Market capitalization and trading volume respectively.

Estimated Model: ARDL (2, 4, 0)

$$NFII = C(1) * NFII(-1) + C(2) * NFII(-2) + C(3) * TVOL + C(4) * TVOL(-1) + C(5) * TVOL(-2) + C(6) * TVOL(-3) + C(7) * TVOL(-4) + C(8) * MCAP + C(9)$$

Where NFII is net foreign institutional investment, Mcap is Market capitalization, Tvol is trading volume at NSE.

The above regression equation provides the coefficient values of all the variables. The coefficients of ARDL model for

NFII, Trading volume and Market capitalization is presented in Table 3.

Table 3: The coefficients of ARDL model for NFII, Trading volume and Market capitalization

Variable	coefficient	t-statistic	Prob.*
N F II(-1)	0.253840	3.913309	0.0001*
N F II(-2)	0.101908	1.554283	0.1220*
D(TVOL)	0.011761	1.685197	0.0938*
D(TVOL (-1))	0.011634	1.375093	0.1710*
D(TVOL(-2))	0.010812	1.164177	0.2460*
D(TVOL(-3))	0.002283	0.253644	0.8001*
D(TVOL(-4))	0.020187	2.680036	0.0081*
D (MCAP)	0.014062	10.54792	0.0000*
C	1479.573	2.104822	0.0368*
Adjusted R-squared	0.505756		

Source: Authors.

Note: * indicates significance at percent level

The table 3 shows that the approximate coefficient of one month and two month lagged values of net FII is positive and significant at 5 percent significance level. It means one percent increase in the one month and two month lagged values of net FII leads to approximately 26% and 10% increase respectively in the net FII in the long run, all other things being equal. The estimated coefficient of Market capitalization is significant indicating that Mcap has positive relation with trading activities of FIIs whereas the p values is less than 5% indicates that NFII is affected by Mcap.

The estimated coefficient of Tvol (Trading volume) and lagged values are significant and positive indicating that FII trading activities are positive correlated with trading volume and its lagged values. The p value of trading volume is greater than 5% indicating that FII trading activities are not affected by trading volume of stock market.

Since this is a multivariate ARDL model, adjusted R-square is to be reported for analyzing the overall influence of the independent variables on net FII. The Adjusted R-square is .0528480 indicating that 58 per cent of the variations in net FII are explained. It can be concluded that market capitalization and trading volume both affected foreign institutional investment trading activities.

Serial Correlation Test

With the help of Breusch-Godfrey Serial Correlation LM test, we find the existence of serial correlation in the given series.

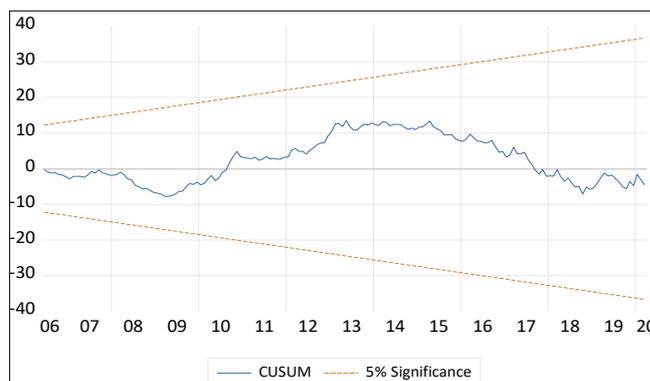
Table 4: Breusch-Godfrey Serial Correlation LM test

F-statistic	0.906870	Prob. F(2,164)	0.4058*
Obs*R-squared	1.914224	Prob. Chi-Square(2)	0.3840*

Source: Authors.

Note: * indicates significance at percent level

The result of Table 4 states that the significance value is greater than 5% i.e. 0.3840, it accept the null hypothesis that there is no serial correlation in the series. The model is fit to further analyze the stability using CUSUM test. The results are shown in fig 5.



Source: EViews 11

Fig 5: Stability Diagnostic model CUSUM Test

As the Variables values lies in between the upper and lower limit, it states that the model is stable. After checking out the stability of the model, now next step is to find out the nature of relationship that exists between all variables. ARDL Long run and Bound test is used for it and the results are given in table no 5.

Table 5: ARDL Long run and Bound test

F-Bounds Test				
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	52.84709	5%	3.1	3.87

(Source: EViews 11)

The results shows that the F-statistic value is greater than the significance upper value so it rejects the null hypothesis that there is no long relationship exist between the variable and accept the null hypothesis that there is long run relationship between NFII, trading volume and market capitalization. To check the causality between NFII, trading volume and market capitalization; granger causality test is used and the result of same is given in table no 6.

Table 6: Granger Causality Test for NFII, Tvol and Mcap

Null Hypothesis	F-Statistic	p-value
NFII does not Granger causes Tvol	0.40139	0.6700*
Tvol does not Granger Cause NFII	0.23259	0.7927*
NFII does not Granger causes Mcap	3.69230	0.7525*
Mcap does not Granger Cause NFII	0.28483	0.0269*

Source: Authors.

Note: * indicates significance at percent level

Based on the table 6 results it can be concluded that the net FII flow and trading volume has no relationship while there is causality running from market capitalization to NFII and not vice versa. So, unidirectional relationship exists between NFII and Market capitalization.

5. Conclusion

The Economic Development of any country depends upon the existence of well-organized financial markets (Rastogi & Husain, 2015; Agarwal, 2016). So the study is conducted to find out the relationship between FII flows, trading volume and market capitalization using monthly data. The reason

behind this study is to know the type of relationship that variable holds and how the Good performance of emerging stock markets has attracted foreign institutional investors (FIIs) from industrial countries (Chattopadhyay et al., 2017). The econometric model that is ARDL and granger causality test is used to ascertain the relation between of FII flows, trading volume and market capitalization. The Granger causality test result shows that there is no relationship exists between net FII flow and trading volume while unidirectional relationship exists between NFII and Market capitalization. The ADRL model found that (a) Market capitalization has positive relation with trading activities of FIIs and NFII is affected by Market capitalization, (b) FII trading activities are not affected by trading volume of stock market.

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