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Study of Stochastic Causality between FII Flows, DII Flows and Indian Stock Market

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ABSTRACT

In the Post 1990s era, due to economic reforms, Indian market has been steadily growing. It has attracted domestic investors as well and foreign players. If looked closely, it is observed that FII, in particular, has constituted a major portion of the total foreign capital flows in India. These capital flows have had both positive as well as negative repercussions for the Indian economy. On the positive side, these capital flows have speeded up the process of economic development by augmenting the domestic investment, contributed towards increased market capitalization, enhanced the level of competition in the Indian capital market and widened the scope for financial intermediation of the Indian economy. But at the same time, these capital flows have also created different types of economic and financial threats to the given system of the Indian economy in terms of inflationary trends, appreciation in ER, overheating of the system and unmanageable volatility in the Indian capital market due to the uncertain nature of these FII/DII flows characterised by the possibility of their sudden withdrawal. The aim of this study is to throw more light on the analysis of FII/DII flows in India and analyse its impact on investment decisions of investors (represented by Nifty) and also to analyze whether there exit some relationship between foreign institutional investment/domestic institutional investment flows and Indian stock market represented by Nifty or not.

Keywords: FII, DII, Indian Stock Market, Nifty.

1. INTRODUCTION

Capital market health is one of the main reflectors of the performance of an economy. When the economy of any country grows, the companies make huge profits which attract the interests of FII's and DII's to

invest in the capital markets. Movement in Share prices are likely to move with GDP. The performance of over the past decade reveals that Indian economy has gradually come out as one of the most sought after investment destinations amongst global investor's and players. Growth might be because of the institutional investor's entities whose primary purpose is to invest and to reap the huge profits. The most common among them are the foreign institutional investors and domestic institutional investors.

Since 1991, Indian economy has emerged as a prominent market for the global investors. The FII, in particular, has constituted a major portion of the total foreign capital flows in India over the last decades *(Pati, 1999)*. These capital flows have had both positive as well as negative repercussions for the Indian economy. On the positive side, these capital flows have speeded up the process of economic development by augmenting the domestic investment, contributed towards increased market capitalization, enhanced the level of competition in the Indian capital market and widened the scope for financial intermediation of the Indian economy. But at the same time, these capital flows have become the underlying reason for different types of risks to the economic and financial system of the Indian economy in terms of inflationary trends, appreciation in ER, overheating of the Indian capital market and unmanageable volatility in the Indian financial system due to the uncertain nature of these FII flows characterised by the possibility of their sudden withdrawal.

"Hot Money" is the term which has been accepted globally to define the nature of flows that is brought in by FII and DII. As this money does not remain stable or loyal to any investment designation due to its greedy (may be genuine nature in its sense), it has made the capital market in general and stock market in particular very volatile. However, one more perspective which is not in sync with the above postulate says that such flows are fair weather friends, which fulfil their promises in term of their longer stay with a particular country during rosy time but not the other way round.

Foreign institutional investors and Domestic Institutional investors' money is often referred to as 'Hot Money' because these flows are considered more volatile than other market forces working in the capital market. *(Report of Working Group on Foreign Investment, 2010)*.

During 2007-08, Indian economy attracted good amount of FII flows amounting to the tone of Rs 66179 cr. which was ever highest since FIIs entry in this country. These unprecedented flows of FII led BSE Sensex and NSE Nifty to go beyond the level of 20000 and 6000 points respectively during that year itself. But, due to the global financial crisis (sub-prime crisis which originated in USA), their investment took a total turnabout change and they pulled back more than Rs. 50000 crore from the Indian financial system during 2008 leading to the biggest ever market crash *(Sumanjeet,2010)*. Thus, FII flows have been impacting various economic factors of the Indian economy directly and indirectly. Some of the major factors which have been affected by FII flows include Risk-Return patterns, Volatility in the Stock Market, Inflationary Trends, Economic Growth, FERs and ER and so on.

2. LITERATURE REVIEW

(Prasad, 1999), in his study "Flow of Foreign Investment in India: Myths and Realities", observed that the liberalisation reforms that have seen their dawn in the post nineties era have had a very good experience as felt by the foreign institutional investors in India which was apparent from the high level foreign capital flows.. (Mohan, 2008) (Akula, 2011), in his report on "Global Financial Crisis and Key Risks: Impact on

India and Asia", examined as to what extent, in the initial stage, foreign direct investment had shown more consistent trends, but later on, it showed more upward moving trends in its flows. Foreign portfolio investment (FPI), on the other hand, had shown more volatility in the trends of its flows. In short, it was concluded by the study that the flows of the foreign capital (including both FDI and FPI) had grown substantially after 2002. However, during 2008 crisis, the country had remained comparatively less affected due to its more proactive economic and banking policies. (Pasricha, 2009), in their study on "Investment Trends of FII in India: An Analytical View", examined the investment trends by FIIs during the years from 1992 to 2009. The study observed that before 1990, the major flows in India constituted the money inflows from NRI and other commercial borrowings. However, after 1990s, the whole picture got changed as claimed by the study.

(Akula, 2011), in his research study titled "An Overview of FII in India", studied FII data for five years i.e. from 2006 to 2010. It has been observed that FII had increased liquidity in the Indian capital market (including both BSE and NSE securities). In the last, as per the study, a positive correlation was found amongst FII, market capitalization, BSE and NSE indices which in turned proved that the liquidity and the volatility of the Indian capital market was highly driven by FII flows.

(Dhiman, 2012), in his research paper titled "Impact of Foreign Institutional Flows on Stock Market", made an analysis of FII flows data ranging from 1992 to 2010. The study observed that over the years, the FIIs had grown many folds in terms of their total amount and registration numbers.. (Azad, 2012), undertook a research on the title "Foreign Institutional Flows and Indian Financial Market: Relationship and Way Forward". The study included a period of ten years ranging from 2000 to 2010. It observed that over the years, FII had become one of the most preferred choices as compared to other external finance sources which happened to be non-debt and non-volatile in nature. (Thakur, 2008), in his study on "Exchange Rate, FII and Stock Index Relationship in India", has made an efforts to predict value for each other and relationship study has also been undertaken using data base from 2000 to 2005. The main perspective of this study was to analyse the data in the light of third generation reforms which have been introduced in India from time to time. As per the observations of the students, it was found that these Stock index, foreign flows and exchange rate are significant in more globalised and connected world.

(Vashishtha, 2011), investigated the stochastic causal relationship between FII and stock market return in their research paper titled "FII and Indian Stock Market: A Causality Investigation". In this study, data for a period of nineteen years which ranged from 1992 to 2010 had been employed for the purpose of analysis. The objective of this study was to have better comprehension of the dynamic relationship between the Indian stock market returns based on BSE Sensex and the FII flows. The study that attempted to know the direction of causality with the application of granger causality test found that both stock market returns as well the flows of FII) granger caused each other. In other words, both had been found to enjoy bi directional causality.

3. OBJECTIVES OF THE STUDY

The present research paper tries to achieve the below mentioned objectives:

1. To study relationship between Foreign Institutional Investment Flows, Domestic Institutional Investment Flows and Nifty.

2. To study the causality between Foreign Institutional Investment Flows, Domestic Institutional Investment Flows and Nifty.

4. NEED OF STUDY

As it has been observed over the past that there has been lot of volatility in the Indian stock market, FII and DII have contributed a lot in the upward and the downward movements of the Stock market, there is a need to go deep in this area. There has been an empirical tendency on the part of FIIs and DIIs to trade in bulk – buying and selling in big way and thereby leading to more uncertainty in the stock market. Hence, in the present paper, en effort has been made to study relationship and causality between the given variables.

5. SCOPE OF THE STUDY

From variables perspective, for this study has included three major variables (representing the health of the Indian capital market has been used. These variables are FII, DII and Nifty. FII represents the confidence of foreign investors in the Indian capital marker or their untold and underlying interests for the returns generated from this market. DII represents the interest of Indian big investors in their own economy. And Nifty has been used as a proxy and barometer for the stock market performance of the

6. RESEARCH METHODOLOGY

Descriptive and analytical research designs have been incorporated for the study and for analysis purposes, in this research paper, secondary monthly data from 2007 to 2017 have been used and RBI, NSE and SEBI have been the sources for this data. Statistically speaking, in this research study, correlation and granger causality test have been applied for relationship and causality interpretations. For the application of granger test, stationarity has been checked for all time series through augmented dicker fuller test. Lag has been applied on the basis of the lowest value of AIC criteria. For knowing the long term association, Johansson co-integration method has been applied.

7. DATA ANALYSIS AND FINDINGS

Relationship Study with the help of correlation analysis has been conducted for these variables. Correlation results between these variables, as shown by the above table are quite eye opening. The high negative correlation between DII and FII suggests that there is altogether difference in the investing strategies of these two strategic investors.

Table 1
Correlation Analysis between DII, FII and Nifty

	DII	*FII*	*Nifty*
DII	1	–0.90	–.0.017
FII	–0.90	1	0.11
Nifty	–0.017	0.11	1

Source: Researcher's Computations.

Their flows are not in sink. When DII are putting their money in India capital market, FII have not been found to do so, as they have been found withdrawing their holdings and might have been investing in some other countries' capital market. The inverse also holds the good. Even Nifty and DII also shares negative relationship though not very strong negative. This shows that there are other investing forces (like FII) whose investing impact in Nifty is more as compared to investing impact of DII in Indian stock market. Nextly, FII and Nifty shares a lukewarm positive correlation, reflecting that the movements in these two time series are in the same direction.

Though correlation analysis has been conducted for knowing the degree and direction of the relationship between these variables, this is not sufficient. As correlation does not necessarily mean causality between the given variables, it may or may not exist between the given variables. Causality is a more depth analysis to know whether a given variable is affected when there is a change in another variable. Granger causality tests have been applied for this investigation.

For the granger causality test application, some specific hypotheses have been framed and tested. The causality between these variables will be checked depending upon the acceptance and /or rejection of Null and/or alternative hypothesis. In case, null hypothesis is rejected, the conclusion will be that there is causality between the two variables and if null hypothesis is accepted, it would indicate that there is causality between the two variables. Worth to note that there can be unidirectional causality, bi directional causality and no causality at all.

Table 2
Hypothesis Formation

S.No.	*Null Hypothesis (H_0)*	*Alternative Hypothesis (H_1)*
1	Nifty does not granger cause DII	Nifty does granger cause DII
	DII does not granger cause Nifty	DII does granger cause Nifty
2	FII does not granger cause DII	FII does granger cause DII
	DII does not granger cause FII	DII does granger cause FII
3	FII does not granger cause Nifty	FII does not granger cause Nifty
	Nifty does not granger cause FI	Nifty does not granger cause FII

Source: Researcher's Computations.

These hypotheses have been tested by applying appropriate statistical tool. For the purpose of 'Test of Stationary or Unit Root Test' (as all time series need to be stationary so that authenticate results and interpretations can be made out) –Augmented Dicker Filler has been applied. Through this test, analysis would be made to know whether variables (FII, DII and Nifty) bring changes in each other value or they do not become the reason for causation for another. This would help us to understand their relation nature more deeply.

For the staionarity analysis, the following hypothesis has been constructed:

Null Hypothesis: DII/FII/Nifty has a unit root or they are non stationary time series.

Alternative Hypothesis: DII/FII/Nifty has no unit root or they are stationary time series.

Table 3
Results of Stationarity for FII

		Statistic value for t	*Probability Value*
	Statistic for ADF (Augmented Dickey-Fuller test)	–7.590979	0.0000
Test critical values	1 percent level	–3.486551	
	5 percent level	–2.886074	
	10 percent level	–2.579931	

Source: Researcher's Computations.

As per above table, the value of *t* statistics is more (ignoring plus and minus sign) than test critical values (3.4, 2.86, 2.57) at 1%, 5% and 10 % and moreover *p* value is less than 0.05, hence, it is concluded that FII time series is stationary. Thus this series would be used for further analysis at its level value and there is no need for differencing.

Table 4
Results of Stationarity Test for DII

		Statistic value for t	*Probability Value*
	Statistic for ADF (Augmented Dickey-Fuller test)	–6.898012	0.0000
Test critical values:	1% level	–3.486551	
	5% level	–2.886074	
	10% level	–2.579931	

Source: Researcher's Computations.

As per above table, the t statistics value (6.89) is more (ignoring plus and minus sign) than test critical values at 1% (3.4), 5% (2.8) and 10 % (2.57) and moreover *p* value (0) is less than 0.05%, hence, DII series is stationary.

This series has been used for the purpose of granger causality test at its original value of at level value.

Table 5
Results of Stationarity Test for Nifty

		Statistic value for t	*Probability Value*
	Statistic for ADF (Augmented Dickey-Fuller test)	–0.793820	0.8169
Test critical values:	1% level	–3.486551	
	5% level	–2.886074	
	10% level	–2.579931	

Source: Researcher's Computations.

In this case, the *t* statistics value is less (ignoring plus and minus sign) than Test critical values; hence this series is non stationary. This series need to be converted into stationary by differencing. For this purpose, the differencing of the time series has been executed to calculate new values of *t* statistics and probability.

Table 6
Results for Differenced Nifty Time Series

		Statistic value for t	*Probability Value*
	Statistic for ADF (Augmented Dickey-Fuller test)	–10.98231	0.0000
Test critical values:	1% level	–3.487046	
	5% level	–2.886290	
	10% level	–2.580046	

Source: Researcher's Computations.

As per the above table which shows the results of differenced Nifty time series values, the t value (10.98) is more (ignoring plus and minus sign) than all values available (3.48,2.86 and 2.58) at 1%, 5% and 10 % of level of confidence. This means that now this series has become stationary. This difference time series of Nifty has been used for the application of granger causality test. The differencing would ensure that the results that would be fetched would be more accurate and dependable. This would also lead to statistics accuracy.

Table 7
Lag Selection for Granger Causality Model

Lag Level	*AIC Value*
1	53.93
2	53.84
3	53.95
4	53.98

Source: Researcher's Computations.

As per the table, at lag level 2, AIC value is the least. We have taken the least value as at this value minimum information is lost while applying a given test like granger causality so lag 2 has been used for the application of granger causality test.

Table 8
Granger Causality Test between Nifty, DII and FII

Hypothesis	*Probability value*
Nifty does not granger cause DII	0.0171
DII does not granger cause Nifty	0.0728
FII does not granger cause DII	0.0151
DII does not granger cause FII	0.0464
FII does not granger cause Nifty	0.0400
Nifty does not granger cause FI	0.0171

Source: Researcher's Computations.

As per the above table, the p value in case of DNIFTY and DII is 0.0171 which is less than 0.05 or 5%. This shows that Nifty affect DII. It is further observed that the p value between DII and Nifty is 0.0728. This value is more than 5%. Hence thus hypothesis is rejected. This means, DII does not granger cause Nifty. Moreover, in case of FII and DII; and FII and Nifty, all p values are less than 5%. This means

FII doe granger cause Nifty and vice versa is also true. And in case of FII and Nifty, both affect each other.

8. CONCLUSION

As we know that there are various forces which affect Indian stock market. In the above research paper, Nifty has been taken as representative of Indian stock market. The other factors which have been taken include DII and FII. As per the findings, there has been found a high negative correlation between FII and DII. Nifty and DII have also shared negative correlation though not so high. However, FII and Nifty enjoy a positive correlation. From causality perspective, it has been observed that FII affect DII and vice versa is also found true. Further findings reveal that FII affect Nifty and Nifty is also causing changes in FII flows. However, on the one hand, Nifty affects FII but vice versa has not been found not true. Overall, it is safely concluded that majority relationships have been found to have cause and effect.

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