

## FOREIGN & DOMESTIC INSTITUTIONAL INVESTMENT AND STOCK MARKET RETURNS IN INDIA – A CAUSAL STUDY

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### ABSTRACT

Foreign institutional investment is the amount of funds invested by institutions such as pension funds and asset management companies incorporated outside India. These institutions have to register with RBI to make portfolio investment in Indian capital market. Domestic institutional investment on the other hand represents the funds invested by institutions such as insurance companies and mutual funds in India. Foreign institutional investment and domestic institutional investment are among the important factors influencing the capital formation and stock market returns. This study focuses on analyzing the causal relationship among foreign institutional investment, domestic institutional investment and stock market returns in India. Granger causality test and ADF test were used in this study. The study covers a time period of 8 years from 2007 to 2015. The results show one way casual relationship between stock market returns and Foreign and domestic institutional investment and two way relationship between the Foreign institutional investment and domestic institutional investment. Hence, the Indian stock market returns significantly influences the amount of foreign and domestic institutional investment. But institutional investments do not significantly influence the stock market returns during the study period. Similarly the foreign institutional investment and domestic institutional investment significantly influence each other in Indian capital market during the study period.

**Key words:** *Foreign institutional investment, Domestic institutional investment, Granger causality test, ADF test, Causal relationship.*

### INTRODUCTION:

The economic development of a country can be recognized by many indicators. One of the important indicators of economic development is the performance of its financial markets (Levine and Zervos, 1998). If the returns from the financial markets of a country are high, it is a good indicator of economic development. The returns earned in a stock market is determined by many factors, such as level of industrialization, state of the economy, flow of funds into the market, global economic scenario, foreign and domestic institutional investment. One of the important variables to influence the stock market returns is the institutional investments, both domestic and foreign (Paramita Mukerjee *et al.*, 2002).

Foreign institutional investments (here after known as FII) represent the funds invested in to Indian capital market by the institutions incorporated outside India. These institutions have to register themselves with Securities & Exchange Board of India in order to make investment in Indian capital market. They include overseas pension funds, insurance companies, asset management companies, banks and hedge funds registered outside India. The investment made by these FIIs is usually made for short period of time. Foreign institutional investors are allowed to invest in Indian capital market through portfolio investment scheme (PIS) administered by reserve bank of India (Krishna and Bharat, 2014). These foreign institutional investors

are allowed to invest up to 24% of the paid up capital of any Indian company (20% in case of public sector banks including state bank of India) (RBI Regulations, 2010). Domestic institutional investors are institutions such as insurance companies, banks, mutual funds etc (Singh, 1999; Cooray and Wickremasinghe, 2007 and Mukerjee paramita and Bose Suchismita, 2008). These institutions invest the funds they pooled in from their customers. The investments made by these institutions are known as Domestic institutional investments (here after known as DII). They also employ professional fund managers and employ investment strategies. Both FII and DII are among the important factors which influence the stock market returns and volatility.

### Background study:

Bansal Anand and Pasricha(2009) in their paper titled "Foreign institutional investors impact on stock prices in India" found that the average returns has not varied but the volatility has reduced after FIIs were permitted into Indian capital market. Jain Mamta and Priyanka laxmi (2012) in their paper titled "Impact of foreign institutional investment on stock market with special reference to BSE – A study of last one decade" found that FIIs influence sensex movements to a greater extent.

Prakash Ankeshwar and Dharamveer (2012) in their paper titled "FIIs: Fuel of India's growth engine" observed that the major falls in stock markets were the after effects of withdrawals of money by FIIs. Prasanna

(2008) in his research paper titled "Foreign Institutional Investors: Investment Preferences in India" found that the foreign investment is more in companies with higher volume of publicly held shares. They also found that the promoters' holding and foreign investments are inversely related. Krishna Prasanna and Bharat Bansal (2014) observed that the foreign institutional trading significantly influences the market liquidity in a negative direction. They also found that an increase in gross purchase significantly reduces the future market liquidity.

Walia Karan and Rimpi Walia (2012) studied the impact of foreign institutional investment on the stock market. The researchers observed that the FIIs influence the sensex movement to a greater extent and has a positive correlation. Cheng *et al* (2006) in their paper titled "Exchange rates and prices: revisiting Granger causality tests" analysed the causal relationship between the exchange rates and prices in USA and its trading partners. They found no causal relationship between the consumer prices and exchange rates. Ibrahim (2000) in their paper titled "co integration and Granger causality tests of stock price and exchange rate interactions in Malaysia" analysed the causal relationship between the exchange rates and stock prices. They found no evidence for a long run relationship between exchange rates and stock prices in Malaysia.

#### STATEMENT OF THE PROBLEM:

Both FII and DII are among the important factors which influence the stock returns and volatility. But the previous studies have been focusing on FII and completely ignoring the impact of DII on the stock market. The previous studies also used only correlation to establish the casual relationship among the variables. Correlation between variables may not exhibit causal relationship. The previous studies were all using monthly or annual data for the analysis. But the impact of FII and DII can be analysed better when we analyse daily data.

This study aims at analyzing the causal relationship among FII, DII and stock market returns. This study will throw light into the causal relationships among FII, DII and Market returns using Granger causality test (1969).

Three variables chosen for this study are:

1. Net Foreign institutional investment (FII)
2. Net Domestic Institutional Investment (DII)
3. Sensex Daily returns

Net foreign institutional investment and net Domestic institutional investment were calculated by subtracting the gross sale of investment from the gross purchase of investments by the respective institutions. Sensex daily returns were used as a proxy for market returns. Sensex returns were calculated by the following formula:

$$R_t = (S_t - S_{t-1})/S_{t-1} \quad (1)$$

Where  $R_t$  = Sensex Return for the period t

$S_t$  = Sensex closing index for the period t

$S_{t-1}$  = Sensex closing index for the previous time period (t-1)

This study is designed to analyse the casual relationships among the three variables in question, Foreign institutional investment, Domestic institutional investment and stock market returns. Granger causality test was employed to analyse the causal relationship among these variables.

Objectives:

- To study the causal relationship between DII and stock market returns
- To study the causal relationship between FII and Stock market returns
- To study the causal relationship between FII and DII

#### DATA COLLECTION AND METHODOLOGY:

This study is based on secondary data. The data required for the study were collected from websites such as [www.moneycontrol.com](http://www.moneycontrol.com), [www.bseindia.com](http://www.bseindia.com) and [www.sebi.gov.in](http://www.sebi.gov.in). Data for a period of (from 03.05.2007 to 31.03.2015) 8 years were chosen for this study. This time frame was chosen keeping in view the recession of 2008 and availability of data. Daily data was considered optimal for the study, because the causal relationships among the study variables can be best explained by daily index movements.

#### Data analysis:

**Augmented Dickey Fuller test:** The data set was first analysed with Augmented Dickey Fuller test (hereafter known as ADF test) (1976) for stationarity. This test is a check on the stationarity of the individual time series. A time series is said to be stationary when the mean and auto co variances are not depend on time. This test is necessary because the statistical analysis performed on non-stationary time series could yield spurious results. Hence all the test variables were tested for stationarity using ADF test. The results of ADF test are summarized in table 1-3.

Table 1 reveals the t statistic and P value for DII net investment stationarity test. It can be observed that the calculated t value (-9.408514) is higher than the critical values at different significant levels. The p value(0.0000) is also less than 0.05 indicating the rejection of the null hypothesis. Hence the variable DII net investment does not have a unit root. In other words, DII net investment is stationary.

Table 2 reveals the t statistic and P value for FII net investment stationarity test. It can be observed that the calculated t value (-11.95906) is higher than the

critical values at different significant levels. The P value is also less than 0.05. Hence FII net investment is stationary.

Table 3 shows the t statistic (-41.08550) and P (0.0000) value for Sensex returns stationarity test. It can be observed that the t statistic is higher than the critical values and P value is less than 0.05. Hence Sensex return is stationary. Once the stationarity of the variables are established the next step is to conduct granger causality test on the test variables.

**Granger Causality test:** Granger causality test (1969) is a hypothesis test to check whether one time series can provide useful information to predict the future value of another time series. Even though the test is named as causality test, the definition of causal relationship is quite different. This test determines whether one variable is able to help in forecasting the other variable apart from the lagged values of the other variable. Hence Granger causality test is otherwise known as predictive causality test (Nelson and Schwert, 1982).

Granger approach to the question of whether x causes y is to see how much of current y can be explained by past values of y and then to see adding lagged values of x can improve the explanation. E views econometrics software was used to analyse the causal relationship among the variables.

The following bi-variate equations were estimated for each set of variables.

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \dots + \alpha_l Y_{t-l} + \beta_1 X_{t-1} + \dots + \beta_l X_{t-l} + \varepsilon_t \quad (2)$$

$$X_t = \alpha_0 + \alpha_1 X_{t-1} + \dots + \alpha_l X_{t-l} + \beta_1 Y_{t-1} + \dots + \beta_l Y_{t-l} + \mu_t \quad (3)$$

The null hypotheses for the granger causality test are that X does not Granger cause Y and that Y does not granger cause X. This test provides evidence for the existence and direction of causal relationship between two time series. The coefficients ( $\beta$ ) in equation (1) and (2) represent the significance of respective lagged variable in the equation.

The test variables were put to Granger causality test in three sets, i.e FII and DII, FII and Sensex Returns, DII and sensex returns. Hence bi-variate equations were used to analyse the causal relationship. One of the important step in Granger causality test is to select the lag order. AIC criterion was used to select the optimum lag order. The result of the lag order selection process is shown in table 4. It can be observed that the lag order selected by Akaike Information Criteria (AIC) is seven. Hence the Granger causality test was performed with a lag order seven. The Granger causality test results obtained were summarized in table 5.

Table 5 shows the F value and corresponding P value for three sets of Granger causality tests. The reported F statistic is for a joint null hypothesis that all the

coefficients ( $\beta$ ) in the respective equation are equal to zero.

$$\beta_1 = \beta_2 = \dots = \beta_l = 0 \quad (4)$$

The calculated F statistic is a significance test for all the coefficients ( $\beta$ ) in the bi-variate equations in the causality test. If all the coefficients ( $\beta$ ) in the equation are not significant, then null hypothesis of no causal relationship cannot be rejected. If any one or more coefficients ( $\beta$ ) are significant then the null hypothesis of no causal relationship can be rejected and causal relationship between the study variables can be established.

It can be observed that table 5 gives two null hypotheses for each group of study variables. The first group of variables shown in table 5 is DII net investment and Sensex returns. The first null hypothesis in group one is that "DII net investment does not Granger Cause SENSEX returns" with a F statistic of 1.14614 and P value of 0.3312. Since the P value is higher than the significance level 0.05, the null hypothesis cannot be rejected. The second null hypothesis in group one is that "SENSEX returns does not Granger Cause DII net investment" with F statistic of 15.3659 and P value of 1.E-19. Since the P value is less than 0.05, the null hypothesis can be rejected at 5 % significant level. Hence it can be concluded that the DII net investment does not significantly influence sensex returns but sensex returns significantly influences the investment decisions of Domestic institutional investors.

Group two of study variables consists of FII net investment and sensex returns. The first null hypothesis in this group is that "FII net investment does not Granger Cause SENSEX Returns" with F statistic of 1.84486 and P value of 0.0750. Since the P value is higher than 0.05, the null hypothesis cannot be rejected at 5% significance level. The second hypothesis in this group is that "SENSEX Returns does not Granger Cause FII net investment" with F statistic of 18.8522 and P value of 2.E-24. Since the P value is less than 0.05, the null hypothesis can be rejected at 5% significance level. Hence it can be inferred that FII net investment in to Indian stock market does not significantly influence the sensex returns but sensex returns significantly influences the amount of Foreign institutional investments flowing in to Indian capital market.

Group three of the study variables consists of FII net investment and DII net investment. The first null hypothesis in this group is that "FII net investment does not Granger Cause DII net investment" with F statistic of 14.9365 and P value of 5.E-19. Since the P value is less than 0.05, the null hypothesis can be rejected at 5 % significance level. The second null

hypothesis in this group is that "DII net investment does not Granger Cause FII net investment" with F statistic of 3.22174 and P value of 0.0021. Since the P value is less than 0.05, the null hypothesis can be rejected at 5% significance level. It can be concluded that the FII net investment and DII net investment significantly influence each other confirming a two way causal relationship between the two variables.

#### FINDINGS:

This study was undertaken to analyse the causal relationship among three study variables, FII net investment, DII net investment and Sensex returns (proxy for stock market returns). There were two stages to the study. The first stage of the study was focusing of analyzing the stationarity of the individual time series. The second stage of the study analysed the causal relationship among the study variables. At the end of the study the following were the findings:

- FII daily net investment, DII daily net investment and daily stock market returns are stationary in nature during the study period.
- DII net investment does not significantly influences the stock market returns in India during the study period.
- Stock market returns on the other hand significantly influences the investment decisions or the amount of funds invested by Domestic institutional investors during the study period.
- FII net investment in to India does not significantly influences the stock market returns in India during the study period.
- The Stock market returns in India is an important factor which attracts foreign institutional investment in to India as it is significantly influencing the amount of FII net investment during the study period.
- Domestic institutional investment significantly influences the amount of foreign institutional investment in to India during the study period.
- Foreign institutional investment significantly influences the amount of domestic institutional investment during the study period.
- There is one way causal relationship between the stock market returns and Domestic institutional investment which means, the stock market returns significantly influences the amount of DII net investment but the DII net investment does not significantly influences the stock market returns.
- One way causal relationship was also observed between Stock market returns and Foreign institutional investment which means, the stock market returns influence the amount of FII net investment but the FII net investment

does not significantly influences the stock market returns.

- Two way causal relationship was observed between FII net investment and DII net investment which means, these institutions (both domestic and foreign) taking cues from each other in making investment decisions. In other words, FII net investment and DII net investment significantly influence each other during the study period.
- While institutional investors marking their investment decisions, they do consider the stock market returns and investment strategies of other institutions.

#### CONCLUSION:

This study was aimed at analyzing the causal relationships among FII net investment, DII net investment and stock market returns. It was observed that the stock market returns has one way causal relationship with DII net investment and FII net investment. Two way causal relationships were observed between DII net investment and FII net investment. This study also reveals the behaviour of Indian stock market towards foreign institutional investment. Foreign institutional investment and domestic institutional investment do not have any significant influence on the stock market returns during the study period (2007 -2015).

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**Table 1:** ADF test result – DII net investment

Null Hypothesis: DII\_NET investment has a unit root  
 Exogenous: Constant  
 Lag Length: 4 (Automatic - based on SIC, maxlag=25)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.408514	0.0000
Test critical values: 1% level	-3.433846	
5% level	-2.862971	
10% level	-2.567579	

\*MacKinnon (1996) one-sided p-values.

**Table 2:** ADF test result – FII net investment

Null Hypothesis: FII\_NET investment has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=25)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.95906	0.0000
Test critical values: 1% level	-3.433773	
5% level	-2.862939	
10% level	-2.567562	

\*MacKinnon (1996) one-sided p-values.

**Table 3:** ADF test result – SENSEX Returns

Null Hypothesis: SENSEX Returns has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=25)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-41.08550	0.0000
Test critical values: 1% level	-3.433483	
5% level	-2.862810	
10% level	-2.567493	

\*MacKinnon (1996) one-sided p-values.

**Table 4:** VAR Lag order selection criteria

VAR Lag Order Selection Criteria  
 Endogenous variables: SENSEX\_Returns  
 DII\_NETPurchase and FII\_NET\_Purchase  
 Exogenous variables: C  
 Date: 10/05/16 Time: 15:09  
 Sample: 3/05/2007 31/03/2015  
 Included observations: 1675

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-21330.37	NA	23185762	25.47268	25.48239	25.47628
1	-20820.96	1016.391	12756376	24.87517	24.91403	24.88957
2	-20734.00	173.1785	11622625	24.78210	24.85009*	24.80729*
3	-20718.88	30.07216	11537917	24.77478	24.87192	24.81077
4	-20702.74	32.02645	11439997	24.76626	24.89254	24.81304
5	-20689.68	25.87540	11384648	24.76141	24.91683	24.81899
6	-20678.86	21.38665	11360002	24.75924	24.94380	24.82761
7	-20669.54	18.40281*	11355629*	24.75885*	24.97256	24.83802
8	-20664.46	9.993850	11409029	24.76354	25.00639	24.85351

\* indicates lag order selected by the criterion

**Table 5:** Granger causality test summary

Pairwise Granger Causality Tests  
 Date: 10/05/16 Time: 15:18  
 Sample: 3/05/2007 31/03/2015  
 Lags: 7

Null Hypothesis:	Obs	F-Statistic	Prob.
DII_NET investment does not Granger Cause SENSEX Returns	1705	1.14614	0.3312
SENSEX Returns does not Granger Cause DII_NET investment		15.3659	1.E-19
FII_NET investment does not Granger Cause SENSEX Returns	1713	1.84486	0.0750
SENSEX Returns does not Granger Cause FII_NET investment		18.8522	2.E-24
FII_NET investment does not Granger Cause DII_NET investment	1706	14.9365	5.E-19
DII_NET investment does not Granger Cause FII_NET investment		3.22174	0.0021

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