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An Empirical Evidence of Dynamic Interaction between institutional fund flows and Stock Market Returns

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ABSTRACT

This study examines the dynamics of the relationship between institutional investment flow and stock returns for India using daily data over the period of 1st Jan 2002 to 31st July 2012. The analysis has been conducted in a two and three factors vector autoregression framework in which we considered investment flow of two sets of institutional investors i.e., foreign institutional investors (FIIs) and domestic institutional investors (DIIs), separately as well as jointly to form the endogenous part of vector autoregression system. The separate analysis for each institutional investors group reveals that, FIIs flow do not have any significant impact on market returns, the DIIs investment flow do. We also find that the fund flow from both the investor groups significantly affected by their own lags and lagged returns, implying that they follow their own past strategy as well as the recent market behaviour albeit their trading strategy differs. Considering these two institutional investment groups jointly, we find that the net flow of both FIIs and DIIs significantly influences Indian stock market even after controlling for market fundamentals. Further we find a feedback relationship between the institutional investment flow and stock market returns. Overall, it is found that the institutional investment flow collectively impact the stock market returns.

Key Words: Institutional Investment, Mutual fund flows, Foreign Institutional Investment, Stock market returns

JEL Codes: G10, G20, G23

1. Introduction

The decision of opening up the Indian equity market to the international investors encourages lager participation of the foreign institutional investors (FIIs) into the Indian capital market. Secondly, together the FIIs and Domestic Institutional Investors (DIIs) such as Indian mutual funds constitute a major chunk of investment from the international and domestic investors. During the last decade, the total assets under their management were amount to be around 20 percent of the total market capitalization. These two sets of institutional investors have become an integral part of Indian capital market (Mukherjee and Roy, 2011). The net investment of FIIs has risen sharply from Rs. 9933.40 crores in the year 2000-01 to Rs. 93725.50 crores in the year 2011-12; and the net investment of mutual funds rose significantly to Rs. 333462.9 crores in 2011-12 from Rs. 2256.51 crores in 2000-01 (SEBI). However, the trading behavior of the FIIs and DIIs in India are quite different. In this study, we investigate the interrelationship of these two sets of institutional investors and whether their activities indeed affect the overall stock market in India. It is expected that the analysis will provide an insight of the investment strategies of the two sets of institutional investors that highly regulated by prudent financial investors and their impact on the stock market behavior and vice versa.

The study of the relationship between institutional investment and stock return receives a considerable attention in the finance researches. In order to explain this relationship, the literature provides three prominent hypotheses**.** First, the *feedback trading hypothesis* (Davidson and Dutia, 1989; Delong *et al*., 1990) that postulates a positive relationship between institutional investment and lagged stock returns (also known as the positive feedback trading or momentum trading). Second, *the price pressure hypothesis* (Harris and Gurel, 1986; Sleifer, 1986) that presumes the stock return to be positively related with contemporaneous fund flows but negatively related with lagged fund flows. Third, *the information revelation hypothesis* (Lee *et al*., 1991) states that the institutions make the use of available information, thereby, time their trade better.

Most of the previous empirical studies, documenting the institutional investment flows to be highly correlated with the stock returns, are largely focused on mutual fund flows of developed countries. For example, Warther (1995), Grinblatt *et al*. (1995), Wermers (1999), Nofsinger and Sias (1999) and Bennett *et al*. (2003) document that institutional fund flows are positively related with the contemporaneous returns. Boyer and Zheng (2009) document

similar findings for mutual funds and foreign investors. Edelen and Warner (2001) find that flows are positively related with contemporaneous and lagged market returns. On the other hand, Gompers and Metrick (2001) find the lagged returns are negatively related to institutional flows once controlling for the market capitalization. Yan and Zhang (2009) show that this relationship driven by short-term institutions and document that trading of these institutions forecast future stock returns. Rakowski and Wang (2009) conclude that fund investors follow contrarian behavioural strategy. Oh and Parwada (2007) document a similar findings for Korean mutual fund industry. Their analysis reveal that the fund flows positively related to stock purchases and sales, but negatively associated with net flows. Fortune (1998) and Alexakis *et al.* (2005) document a positive contemporaneous relationship as well as a bi-directional relationship between market returns and fund flows. Overall, these literatures provide a mixed result regarding interacting behaviour of stock market returns and institutional investment flows.

In Indian context also, previous researches are largely concentrated on specific institutional investor category individually either between FIIs and stock returns (e.g. Chakrabarti, 2001; Mukherjee *et al*., 2002; Thenmozhi and Kumar, 2009; Thiripalraju and Acharya, 2011) or between mutual funds and stock returns or volatility (e.g. Sehgal and Tripathi, 2009; Thenmozhi and Kumar, 2009; Thiripalraju and Acharya, 2011).

Mukherjee *et al*. (2002) finds that stock returns have a significant impact on FIIs flows, but changes in FIIs flows do not have a significant impact on stock returns. Thenmozhi and Kumar (2009) analyse the interaction between mutual fund flows and stock return to document a positive concurrent relationship between market return fund flows. Sehgal and Tripathi (2009) compare the investment behaviour of mutual funds and FIIs and finds that the stock market returns cause both FII flows and mutual fund flows. This study concludes that domestic institutional investors react late to market movement as compare to FIIs. Mukherjee and Roy (2011) document that mutual funds influence the decision of FIIs when they invest in equity, whereas FIIs decision is opposite to mutual funds. Moreover, their findings indicate one-way causation from returns to FII investment and bidirectional causality between mutual fund flow and market returns. On the contrary, Thiripalraju and Acharya (2011) find a bi-directional causality between FIIs investment and stock market returns and that market returns cause mutual fund flow. Furthermore, this study finds that while mutual fund investment negatively related to lagged market returns, a positive relationship is evident between FIIs investment and lagged returns. Bose (2012) takes the mutual fund flows and

FIIs fund flows simultaneously and examine their impact on stock market returns for post-crisis period over 2008 to 2012. She concludes that stock returns are determined by its own past values and lagged FIIs investment but not by mutual funds.

Our approach differs from previous Indian studies as we analyses the relationship by considering the two sets of institutional investors individually as well as jointly within the same framework as attempted by Bose (2012). However, unlike Bose (2012) which considered the after crisis period only, we took a longer period spanning from 2002 to 2012 and controlled the crisis period with a dummy variable. Secondly, as suggested by Cha and Lee (2001), we consider a set of market fundamentals variables and a financial crisis dummy as exogenous factors in the system.

The remainder of the paper is organized as follows. The next section discusses the dataset and methodology adopted for the empirical analysis. The empirical findings are discussed in section 3, and finally section 4 concludes the paper.

2. Data and Methods

2.1. Data Sources

Daily closing price data of BSE Sensex and market capitalization are obtained from PROWESS database of CMIE. The closing prices are then converted as $r_t = \ln\left(\frac{P_t}{P_{t-1}}\right)$ where, r_t is the compounded return at time *t* and P_t and $P_{t-1}$are the daily stock index at the two successive days *t* and *t-1* respectively. Daily data on the institutional equity investment flow (purchase, sales and net) of FIIs and Mutual Funds are obtained from the Securities and Exchange Board of India (SEBI). Following Warther (1995), Goetzmann and Massa (2003) and Oh and Parwada (2007), we normalized all the flow variables by a rolling 90-day moving average of the BSE Sensex market capitalization in order to control for the market and fund growth. Thus, for example, STDPUR= PURCHASE/ROLLMCAP, where STDPUR is the standardized flows, PURCHASE is the raw flows before standardization, and ROLLMCAP are the rolling moving average of the market capitalization in the past 90 trading days. Similarly, STDSALES = SALES/ROLLMCAP and STDNET = NET/ROLLMCAP are calculated for both FIIs and Mutual Fund flows. We use three types of market fundamental variables namely, the dividend yield, exchange rate (INR vs. US$), and the short term interest rate proxied by call money lending rate, to further analyze if institutional equity investments affect market returns in the presence of these fundamentals. Daily data on exchange rate and

call money rate are obtained from Reserve Bank of India website, and the dividend yields are obtained from Bombay Stock Exchanges. Following Oh and Parwada (2007) we consider a five days moving average on the data of all the three fundamental variables. The sample period for final analysis ranges from 1st Jan 2002 to 31st July 2012. We also introduce a dummy variable in order to control for the impact of financial crisis, by considering a value of 1 from 8th Jan 2008 to 9th March 2009 (the bear market period due to US subprime crisis) , and 0 otherwise.

2.2. Methodology

In order to analyze the dynamic relationship between institutional (FIIs and MFs) investment flows and stock market returns this study uses a *vector autoregression* (VAR) approach. The basic p-lag VAR model (VAR(p)) in its general form, may be defined as

$$Y_t = c + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \ldots\ldots\ldots\ldots + \Phi_p Y_{t-p} + \varepsilon_t, \quad t = 1,2,\ldots,T \qquad (1)$$

where $Y_t = (y_{1t}, y_{2t}, \ldots\ldots\ldots, y_{nt})'$ is a vector of $(n \times 1)$ time series variables, c is a k-vector of intercepts, Φ_i are $(n \times n)$ coefficient matrices with all eigenvalues of Φ having moduli less than one to satisfy the stationary property of time series, and ε_t is an $(n \times 1)$ i.i.d zero mean white noise error vector process with time invariant covariance matrices $\sum$. With the stochastic exogenous variables and the seasonal dummy variable or linear time trend, the general form of VAR(p) model can be defined as

$$Y_t = c + \Phi_1 Y_{t-1} + \Phi_2 Y_{t-2} + \ldots\ldots\ldots + \Phi_p Y_{t-p} + \varphi D_t + \psi X_t + \varepsilon_t, \quad t = 1,2,\ldots,T \qquad (2)$$

where, D_t represents an $(l \times 1)$ matrics of deterministic components or dummy variables, X_t represents an $(m \times 1)$ matrices of exogenous variables, and the φ and ψ are the parameters matrices. The selection of VAR lag length is based on the lag selection criteria. We use the *Schwarz Bayesian Criterion (SBC).*

3. The Empirical Results

3.1. Summary Statistics

The descriptive statistics of our variables of interest are presented in Table 1 which indicates that all the data series are, at large, deviated from their respective mean values as observed from their respective standard deviations. It is observed that the averages net flows of FIIs are greater than that of Mutual funds. Secondly, the averages inflows are greater than total

outflows for both groups of institutional investors. The value of skewness and kurtosis are away from the standard value of 0 and 3 respectively, indicating a lack of symmetric distributions. The high value of Jarque-Bera test statistics confirms the non-normality of the variables considered. In order to employ the VAR, the time series must satisfy the stationary property. We confirm the stationarity using three types of unit root tests such as Augmented Dickey Fuller (ADF), Phillips-Perron (PP) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. The results are reported in Table 2. This table indicates that except dividend yield and exchange rate all the variables are individually integrated in order I(0). In first difference the dividend yield and exchange rate are found to be stationary.

Table 1. Descriptive Statistics

	Rt	FIIPUR	FIISALES	FIINI	MFPUR	MFSALES	MFNI	DIV	EXRT	INTR
Mean	0.0641	0.00012	0.00010	1.44E-05	3.17E-05	3.12E-05	5.03E-07	1.5553	45.956	5.8943
Median	0.1204	0.00011	9.76E-05	9.51E-06	2.77E-05	2.86E-05	-3.30E-08	1.4656	45.7692	5.7528
Max	15.989	0.00082	0.00049	0.00056	0.000119	0.000205	8.53E-05	2.5688	56.7086	15.446
Min	-11.809	1.58E-06	3.09E-07	-0.00028	3.29E-07	5.98E-08	-0.000113	0.8056	39.2828	0.1916
Std. Dev.	1.6277	6.52E-05	5.41E-05	4.65E-05	1.70E-05	1.47E-05	1.47E-05	0.4273	3.1699	1.8831
Skewness	-0.0709	2.07312	1.73961	2.1131	1.4139	1.6507	0.3297	0.4234	0.3955	0.6508
Kurtosis	10.670	13.0533	8.7378	22.634	5.8903	11.935	7.0468	2.0396	4.0593	5.0074
Jarque-Bera	6382.753	12826.51	4883.699	43750.88	1773.427	9841.878	1823.438	177.8291	189.591	620.844
Prob.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs	2603	2603	2603	2603	2603	2603	2603	2603	2603	2603

Note: Rt=log Returns; FIIPUR=FIIs Purchase, FIISALES=FIIs Sales, FIINI=FIIs Net Investment, MFPUR=Mutual Funds purchase, MFSALES=Mutual Funds Sales, MFNI=Mutual Funds Net investment (All are standardized); DIV=Dividend Yields, EXRT=Exchange Rates, INTR=Interest Rates.

Table 2. Unit Root Tests for Stationary

Variables	ADF	PP	KPSS	Order of Integration
RT	-36.703*	-47.374*	0.189	I(0)
FIINI	-13.012*	-48.078*	0.793	I(0)
FIIPUR	-9.659*	-47.868*	0.703	I(0)
FIISALES	-7.079*	-41.783*	1.144	I(0)
MFNI	-13.628*	-43.629*	0.467	I(0)
MFPUR	-6.834*	-43.268*	1.014	I(0)
FIISALES	-7.979*	-43.917*	0.904	I(0)
DIV	-2.272	-2.071	3.331*	I(1)
D(DIV)	-8.849*	-4.555*	0.112	
EXRT	-1.103	-0.700	0.868*	I(1)
D(EXRT)	-8.312*	-5.753*	0.329	
INTR	-3.493*	-3.862*	0.697	I(0)
D(INTR)	-15.745*	-7.377*	0.033	

Note: *indicates statistical significant at 1% level.

3.2.Vector Autoregression Results and Causality Test

In the first stage we examine the relationship between fund flow and stock market return for FIIs and mutual funds investment (purchase, sales, and net) flow individually. The equations are expressed in a VAR framework as follows.

$$R_t = \alpha_1 + \sum_{i=1}^{p} \beta_{1i} R_{t-i} + \sum_{i=1}^{p} \gamma_{1i} Flow_{t-i} + \varepsilon_t^R . \quad (3)$$

$$Flow_t = \alpha_2 + \sum_{i=1}^{p} \gamma_{2i} Flow_{t-i} + \sum_{i=1}^{p} \beta_{2i} R_{t-i} + \varepsilon_t^{flow} . \quad (4)$$

Where, R_t represents the stock market returns at time t, $Flow_t$ represents the fund flow (purchase, sales, and net) of institutional investors.

The results of the bi-variate VAR models for the investment flows of FIIs and mutual funds are presented in Table 3 and 4 respectively. From Table 3 it is observed that none of the flow variables (purchase, sales and net) have a significant impact on market returns, while stock market returns have significantly influenced by lagged value. The R^2 values, however, are very less (about 1%) implying that the capacity of FIIs investment flows to explain the market return is only marginal. On the other hand, Table 4 shows that returns are significantly influenced by the lagged purchase, and sales. The net investments do show significant impact on market returns at two lags. Moreover, for both FIIs and mutual funds, all the flow variables are significantly and positively influenced by their own lags. This result implies that the institutional investors make their investment strategies by observing the recent market behaviour. Furthermore, the past activity of the institutional fund flows tends to followed by other institutional investors as well.

It is found that returns are positively influence FIIs inflows (purchase) and net investments, but negatively influence the outflows (sales). On the contrary, the returns have negatively associated with mutual fund inflows (purchase) and net investment, but positively associated with mutual funds outflows (sales). These results signify that mutual funds, as a group, sale more and purchase less when market rises[1], whereas foreign institutional investors buy stocks when market rises and sale more when markets down. Thus, in an aggregate level, for foreign institutional investors positive feedback trading is indicated, as the coefficients attached to lagged index return is positively related to FII net investments, while a negative feedback

[1] The stock market also responds to the investment activities of mutual fund investors as the flow variables (purchase, sales and net) have significant and positively affect the market returns (see. Table 4).

trading or contrarian strategy is indicated for mutual funds equity investment, as the lagged index return is negative and significantly related to mutual fund net investment.

Table 3. VAR Results of Fund Flows and Stock Returns (FIIs)

	Purchase		Sales		Net	
	Return	Flow	Return	Flow	Return	Flow
Intercept	-0.0257	2.74E-05	0.0860	2.12E-05	0.0311	6.00E-06
	[-0.29]	**[10.06]**	[0.97]	**[9.65]**	[0.89]	**[7.14]**
R_{t-1}	0.0745	4.15E-06	0.0754	-3.52E-06	0.0720	7.87E-06
	[3.79]	**[6.67]**	**[3.83]**	**[-7.18]**	**[3.66]**	**[16.67]**
R_{t-2}	-0.0576	2.73E-06	-0.0567	-1.41E-06	-0.0685	5.50E-06
	[-2.90]	**[4.35]**	**[-2.84]**	**[-2.83]**	**[-3.31]**	**[11.06]**
R_{t-3}	-0.0165	4.07E-07	-0.0091	8.07E-07	-0.02983	9.70E-07
	[-0.83]	[0.64]	[-0.45]	[1.62]	[-1.41]	[1.91]
R_{t-4}	-0.0031	2.32E-07	-0.00191	-5.43E-08	-0.01572	5.91E-07
	[-0.16]	[0.36]	[-0.09]	[-0.10]	[-0.74]	[1.16]
R_{t-5}	-0.0245	-1.18E-07	-0.0301	7.89E-07		
	[-1.23]	[-0.18]	[-1.51]	[1.59]		
$Flow_{t-1}$	392.835	0.2897	-377.921	0.3704	1430.441	0.1731
	[0.63]	**[14.84]**	[-0.48]	**[19.00]**	[1.75]	**[8.87]**
$Flow_{t-2}$	1052.73	0.1287	831.7711	0.1224	1324.774	0.10691
	[1.65]	**[6.40]**	[1.00]	**[5.91]**	[1.62]	**[5.45]**
$Flow_{t-3}$	-681.994	0.0884	-872.279	0.0807	-176.365	0.1288
	[-1.06]	**[4.38]**	[-1.04]	**[3.88]**	[-0.22]	**[6.70]**
$Flow_{t-4}$	-415.573	0.14687	-722.883	0.1103	-221.309	0.1060
	[-0.65]	**[7.32]**	[-0.87]	**[5.33]**	[-0.29]	**[5.79]**
$Flow_{t-5}$	379.09	0.1194	933.3766	0.1227		
	[0.62]	**[6.18]**	[1.20]	**[6.35]**		
R^2	0.011	0.382	0.010	0.441	0.011	0.299

Note: t-statistics are reported in brackets, the selection of maximum lags is based on Schwarz Bayesian Information Criteria.

Source: Author's Calculation

Table 4. VAR Results of Fund Flows and Stock Returns (MF)

	Purchase		Sales		Net	
	Return	Flow	Return	Flow	Return	Flow
Intercept	-0.0833	6.19E-06	-0.0787	7.10E-06	0.0596	4.29E-07
	[-1.01]	**[9.34]**	[-0.84]	**[11.07]**	[1.87]	[1.62]
R_{t-1}	0.0642	-4.31E-07	0.0790	8.89E-07	0.0741	-1.18E-06
	[3.24]	**[-2.70]**	**[4.01]**	**[6.54]**	**[3.71]**	**[-7.10]**
R_{t-2}	-0.0600	-8.63E-08	-0.0661	6.55E-07	-0.0642	-6.88E-07
	[-3.01]	[-0.54]	**[-3.32]**	**[4.76]**	**[-3.18]**	**[-4.11]**
R_{t-3}	-0.0124	-1.50E-07	-0.0115	5.02E-07	0.0001	-6.39E-07
	[-0.62]	[-0.93]	[-0.57]	[3.63]	[0.006]	**[-3.81]**
R_{t-4}	0.0006	-1.61E-07	-0.00915	3.66E-07		
	[0.03]	[-1.007]	[-0.45]	[2.65]		
R_{t-5}	-0.0209	1.91E-09	-0.0306	4.07E-07		
	[-1.05]	[0.01]	[-1.53]	[2.95]		
$Flow_{t-1}$	6356.508	0.3844	7727.708	0.314278	813.5895	0.2837
	[2.59]	**[19.52]**	**[2.73]**	**[16.13]**	[0.34]	**[14.31]**
$Flow_{t-2}$	2933.697	0.1210	-4437.12	0.1693	6292.174	0.1212
	[1.12]	**[5.75]**	[-1.49]	**[8.28]**	**[2.54]**	**[5.92]**
$Flow_{t-3}$	1222.412	0.1007	4988.510	0.0862	-2412.54	0.0972
	[0.46]	**[4.78]**	[1.67]	**[4.18]**	[-1.01]	**[4.92]**
$Flow_{t-4}$	-1066.39	0.0743	-3360.75	0.0642		
	[-0.40]	**[3.53]**	[-1.13]	**[3.15]**		
$Flow_{t-5}$	-4801.84	0.1257	-318.901	0.1310		
	[-1.95]	**[6.38]**	[-0.11]	**[6.79]**		
R^2	0.0151	0.4195	0.0139	0.4222	0.0113	0.1651

Note: t-statistics are reported in brackets, the selection of maximum lags is based on Schwarz Bayesian Information Criteria.

Source: Author's Calculation

Next, we take both FIIs net investment and mutual funds net investment simultaneously. Considering the fund flow from FIIs mutual funds to be interdependent and forming the endogenous part of VAR system the equations become

$$R_t = a_1 + \sum_{i=1}^{p} \phi_{1i} R_{t-i} + \sum_{i=1}^{p} \varphi_{1i} FIINI_{t-i} + \sum_{i=1}^{p} \gamma_{1i} MFNI_{t-i} + \varepsilon_t^R \quad (5)$$

$$FIINI_t = a_2 + \sum_{i=1}^{p} \varphi_{2i} FIINI_{t-i} + \sum_{i=1}^{p} \phi_{2i} R_{t-i} + \sum_{i=1}^{p} \gamma_{2i} MFNI_{t-i} + \varepsilon_t^{fiini} \quad (6)$$

$$MFNI_t = a_3 + \sum_{i=1}^{p} \gamma_{3i} MFNI_{t-i} + \sum_{i=1}^{p} \varphi_{3i} FIINI_{t-i} + \sum_{i=1}^{p} \phi_{3i} R_{t-i} + \varepsilon_t^{mfni} \quad (7)$$

where R_t, $FIINI_t$, and $MFNI_t$ are the stock market returns, FIIs net investments, and mutual funds net investments at time t respectively; a_1, a_2, a_3 are the intercepts; ϕ, φ, γ are the

parameters to be estimated, and ε_t^R, ε_t^{fiini}, ε_t^{mfni} are the white noise error tems, *p* denotes the lag lengths. In equation (5) FIIs net investment flow Granger cause stock market return if either φ_{1i} are jointly significant by testing null hypothesis of H_0: $\varphi_{11} = \varphi_{12} = \ldots = \varphi_{1p} = 0$. Similarly, mutual funds net investment flow Granger cause stock market returns if either γ_{1i} are jointly significant. The Granger causality for equation (6) and (7) are tested in the similar fashion.

As an improvement we extend the analysis by controlling three fundamental variable namely dividend yield, exchange rate, and interest rate those act as exogenous variables in our VAR system as suggested by Cha and Lee (2001). It is argued that these variables more or less reflect the short run variation of Indian economy. By including these variables we try to see whether Indian equity market and the institutional investors incorporate such informations. In the part of exogenous variable, a dummy variable is also added to represent and control for the affect of US financial crisis. The VAR model by incorporating these factors is expressed as follows.

$$R_t = \omega_1 + \sum_{i=1}^{p} \theta_{1i} R_{t-i} + \sum_{i=1}^{p} \vartheta_{1i} FIINI_{t-i} + \sum_{i=1}^{p} \rho_{1i} MFNI_{t-i} + \delta_1 Dummy + \varsigma_1 dDIV_t + \tau_1 dEXRT_t + \upsilon_1 INTR_t + \varepsilon_t^R \quad (8)$$

$$FIINI_t = \omega_2 + \sum_{i=1}^{p} \vartheta_{2i} FIINI_{t-i} + \sum_{i=1}^{p} \theta_{2i} R_{t-i} + \sum_{i=1}^{p} \rho_{2i} MFNI_{t-i} + \delta_2 Dummy + \varsigma_2 dDIV_t + \tau_2 dEXRT_t + \upsilon_2 INTR_t + \varepsilon_t^{fiini} \quad (9)$$

and

$$MFNI_t = \omega_3 + \sum_{i=1}^{p} \rho_{3i} MFNI_{t-i} + \sum_{i=1}^{p} \vartheta_{3i} FIINI_{t-i} + \sum_{i=1}^{p} \theta_{3i} R_{t-i} + \delta_2 Dummy + \varsigma_3 dDIV_t + \tau_3 dEXRT_t + \upsilon_3 INTR_t + \varepsilon_t^{mfni} \quad (10)$$

In this specification, dDIV, and dRXRT are the first difference of the variable dividend yield and exchange rate respectively, and INTR represents the interest rate.

The results are displayed in Table 5. From Panel A of Table 5, it is evident that both mutual fund flows and the FII fund flows are significantly affect Indian stock market. Both the institutional fund flows (with lags) are found to be significant and positively influencing stock market returns. This result somewhat deviate from the findings of Bose (2012) where she reports the mutual fund flows to be insignificant in determining stock returns (see. Bose,

2012 table 3 Panel C)[2]. Considering FII net investment as the dependent variable, we can see that all the three variable (with lags) such as stock returns, FIINI, and MFNI are significantly determining the net investment of foreign institutional investors. While, the market returns (with lag) and the FIINIs own lags are positive, MFNI is negatively associated with FIINI. Finally, while making MFNI as the dependent variable, it is evident that the stock returns as well as FIINI up to three lags are significant and negatively affecting mutual fund net investment flows.

Table 5. VAR Results of Returns and Fund Flow (FII and MF taking together)

Panel A: VAR analysis of FIIs and mutual funds net investment flows and BSE Sensex Returns						
	Dependent variable = Rt		Dependent variable = FIINI		Dependent variable = MFNI	
Ind var	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Intercept	0.0185	[0.530]	7.04E-06	**[8.361]**	8.46E-07	**[2.920]**
R_{t-1}	0.0685	**[3.429]**	8.39E-06	**[17.426]**	-1.12E-06	**[-6.788]**
R_{t-2}	-0.0809	**[-3.811]**	5.18E-06	**[10.140]**	-6.11E-07	**[-3.473]**
R_{t-3}	-0.0249	[-1.150]	5.42E-07	[1.039]	-5.22E-07	**[-2.904]**
$FIINI_{t-1}$	1759.979	**[2.178]**	0.1810	**[9.310]**	-0.0067	[-1.001]
$FIINI_{t-2}$	1406.544	[1.755]	0.1212	**[6.288]**	-0.0034	[-0.518]
$FIINI_{t-3}$	-199.335	[-0.263]	0.1564	**[8.598]**	-0.0188	**[-3.013]**
$MFNI_{t-1}$	1604.078	[0.667]	-0.3437	**[-5.943]**	0.2762	**[13.882]**
$MFNI_{t-2}$	7373.791	**[2.962]**	0.0188	[0.315]	0.1127	**[5.469]**
$MFNI_{t-3}$	-1585.46	[-0.656]	0.0710	[1.221]	0.0854	**[4.273]**
R^2	0.015		0.300		0.170	
Panel B: VAR analysis of FIIs and mutual funds net investment flows and BSE Sensex Returns in presence of fundamentals and dummy as exogenous variable						
Intercept	0.2458	**[2.184]**	1.74E-05	**[6.460]**	2.39E-06	**[2.563]**
R_{t-1}	0.0636	**[3.183]**	8.27E-06	**[17.230]**	-1.15E-06	**[-6.914]**
R_{t-2}	-0.0837	**[-3.945]**	5.15E-06	**[10.116]**	-6.22E-07	**[-3.530]**
R_{t-3}	-0.0265	[-1.223]	5.64E-07	[1.084]	-5.25E-07	**[-2.918]**
$FIINI_{t-1}$	1419.252	[1.746]	0.1675	**[8.588]**	-0.0087	[-1.291]
$FIINI_{t-2}$	1064.503	[1.320]	0.1081	**[5.590]**	-0.0054	[-0.812]
$FIINI_{t-3}$	-599.22	[-0.785]	0.1415	**[7.727]**	-0.0211	**[-3.340]**
$MFNI_{t-1}$	1314.224	[0.547]	-0.3547	**[-6.160]**	0.2746	**[13.793]**
$MFNI_{t-2}$	7097.611	**[2.855]**	0.0080	[0.134]	0.1111	**[5.387]**
$MFNI_{t-3}$	-1696.49	[-0.703]	0.0657	[1.136]	0.0847	**[4.232]**
Dummy	-0.3376	**[-3.064]**	-7.59E-06	**[-2.869]**	-1.43E-06	[-1.568]
dDIV	-1.2842	[-0.402]	-1.50E-05	[-0.196]	-6.93E-06	[-0.261]
dEXRT	0.6012	[1.330]	-1.07E-05	[-0.988]	1.26E-06	[0.337]
INTR	-0.0301	[-1.695]	-1.52E-06	**[-3.573]**	-2.22E-07	[-1.506]
R^2	0.021		0.308		0.171	

Note: t-statistics are reported in brackets, the selection of maximum lags is based on Schwarz Bayesian Information Criteria.

Source: Author's Calculation

[2] However, her findings based on 5-day moving average of daily flows indicate that both the fund flows are significantly determining stock returns, similar with the present study.

It is clear from Table 5 that, while the BSE returns (with lags) have a positive influence on FII flows, a negative impact is observed in determining mutual fund investment flows during the study period. Similar kind of results has been found after controlling for market fundamentals. With market fundamental and the dummy variable, the BSE return is directly affected by mutual fund flows and the lagged stock returns but not by the FII investment flows. The dummy variable that control for the US subprime crisis has turned to be negative and significant implying the stock market was adversely affected due to US crisis. The three fundamental variable, however, do not turn out to be significant in determining market returns. Similar to Panel A of table 5, Panel B also shows that mutual fund flow is negatively associated with BSE return and FII flows. The FIINI however, is positively influenced by BSE return but negatively influenced by mutual fund flows. Furthermore, the FII net investment also sensitive towards the change of interest rate as the interest rate is significant and negatively related to FIINI.

The results from the causality tests are reported in Table 6. Panel A of Table 6 represent a three-factor Granger causality/Block exogeneity tests without controlling the market fundamentals, while Panel B represent the causality analysis with the presence of market fundamental and dummy. Panel A indicates a bi-directional causation between the institutional investment and stock market returns. These results suggest that the stock market returns may contain information about the two groups of institutional investment flows. Similarly, both mutual funds as well as FII net equity investments response to the market information. However, while controlling the market fundamentals and dummy variable, we do not able to reject the null hypothesis that 'FII net investment flow do not granger cause stock return at the usual 5 percent level of significance. But together FII and mutual fund net investment flow do granger cause the stock return. In both the cases, it is evident that market returns strongly Granger cause institutional investment flow.

The impulse response function depicts the relationship between innovations in stock market returns and innovations in net flow. The estimated dynamic response of FII net flows and mutual fund net flows to a one standard deviation shocks to stock returns are described in Figure 1. This figure indicates that the response of sensex return to both types of institutional investment flows is negligible or insignificant. The FII net investment is positively responding to stock return about up to 3 days, and it is negatively responding to the mutual fund flows. The response of mutual fund net flows to stock return is initially positive but it turns to be negative in the next two days. It responds negatively to the FII net flows.

Table 6: Granger Causality Test of Stock Returns and Institutional Investment

Panel A: VAR Granger Causality/Block Exogeneity Wald Tests without Fundamentals				**Panel B: VAR Granger Causality/Block Exogeneity Wald Tests in the presence of Fundamentals**			
Dependent variable: Rt							
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
FIINI	10.6754	3	0.0136	FIINI	5.5485	3	0.1358
MFNI	11.3679	3	0.0099	MFNI	10.2460	3	0.0166
All	18.4788	6	0.0051	All	13.7770	6	0.0322
Dependent variable: FIINI							
Rt	433.994	3	0.0000	Rt	421.588	3	0.0000
MFNI	37.1402	3	0.0000	MFNI	40.2712	3	0.0000
All	454.568	6	0.0000	All	442.859	6	0.0000
Dependent variable: MFNI							
Rt	67.6648	3	0.0000	Rt	69.6740	3	0.0000
FIINI	15.1087	3	0.0017	FIINI	19.0973	3	0.0003
All	104.368	6	0.0000	All	109.174	6	0.0000

Source: Author's Calculation

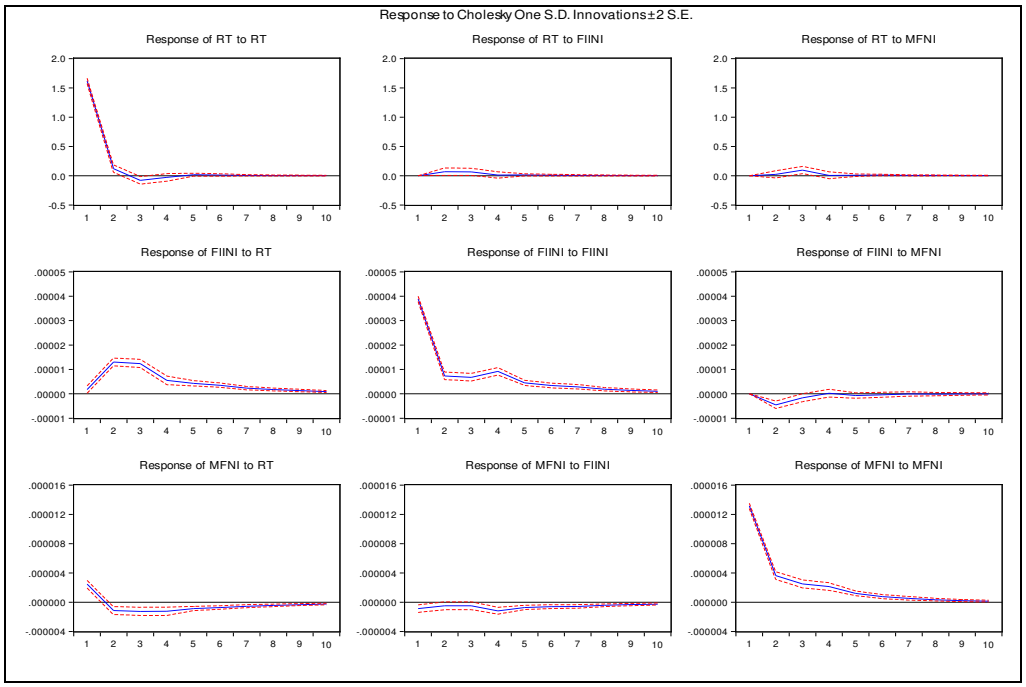

Figure 1: Impulse Response Function

4. Summary and Conclusions

The institutional investors such as, FIIs and Domestic mutual funds, gain a significant role in Indian equity market. This study empirically examines the dynamics interaction of these two sets of institutional investors and the stock market behavior in a structural VAR framework using 10 years of daily data spanning from 1st Jan 2002 to 31st July 1012. The analysis has been done by considering these two sets of institutional investors individually as well as simultaneously. The results indicate that in an aggregate level, FII follows a positive feedback trading strategy, whereas, mutual funds follow a negative feedback trading strategy. Precisely, the results are summarized as follows.

The individual analysis for FIIs and mutual funds reveals that: (a) while FIIs fund flows do not significantly affect stock market returns, the fund flows of mutual funds do; (b) the investment flows from both groups have significantly associated with their own lags and the lagged returns suggesting that institutional investors follow their own past strategies as well as the recent market behavior; (c) while FIIs buy more stocks when market rise and sales more when markets down, mutual funds sale more and purchase less when market rises. Considering the fund flow of FIIs and mutual funds simultaneously, this study finds that both the investors groups jointly influence the stock market return. It is also found that the FII investment flows are determined by their past activities as well as the past returns and past mutual fund activities. The relationship between the net flow of FIIs and mutual funds is found to be negative. This study also finds a two-way causation between institutional investment flow and stock market returns, suggesting that stock market contains information about the two sets of institutional investors considered in this study. Thus, it can be concluded that although their trading strategies are different, collectively, their investment activity can change the direction of the stock market in India.

However, as it is obvious that the trading strategies of different institutions are differs, inclusion of other domestic institutional investors such as insurance companies, hedge funds etc. may improve our understanding of the dynamic relationship between institutional investment and stock market behavior. Future research may incorporate these factors.

References

Alexakis, C., N. Niarchos,, Patra, T., and Poshakwale, S. (2005), "The dynamics between stock returns and mutual fund flows: Empirical evidence from the Greek market", *International Review of Financial Analysis*, Vol. 14, pp. 559-569.

Bennett, James, R. Sias, and Laura T. Starks. (2003), "Greener Pastures and the Impact of Dynamic Institutional Preferences." *Review of Financial Studies* Vol. 16, No.4, pp. 1199-1234.

Bose, Suchismita (2012), "Mutual fund investment, FII investments and Stock Market Returns in India", *Money and Finance*, pp. 89-110.

Boyer, B. and Lu Zheng (2009), "Investor Flows and Stock Market Returns", *Journal of Empirical Finance*, Vol. 16, pp. 87-100.

Cha, H. and Lee, B. (2001), "The market demand curve for common stocks: Evidence from equity mutual fund flows", *Journal of Financial and Quantitative Analysis*, Vol. 36, pp. 195-220.

Chakrabarti, R. (2002), "FII flows to India: Nature and Causes". *Money and Finance*, Vol. 2, No. 7, pp. 61-81.

Davidson, W. N. and Dutia, D. (1999), "A not on the behavior of securities returns: A test of stock market over reaction and efficiencies", *Journal of Financial Research*, Vol. 12, No. 30, pp. 245-252.

DeLong, B., Shleifer, A., Summers, L. H., Waldmann, R. J. (1990), "Positive feedback investment strategies and destabilizing rational speculation", *Journal of Finance*, Vol. 45, No 2. pp. 379-395.

Edelen, Roger, and Warner, Jerold (2001), "Aggregate Price Effects of Institutional Trading: A Study of Mutual Fund Flow and Market Returns*", Journal of Financial Economics,* Vol. 59, No. 2, pp. 195-220.

Fortune, P. (1998), "Mutual Funds Part II: Fund Flows and Securities Returns", *New England Economic Review*, pp. 3-22.

Goetzmann, W., Massa, M. (2003), "Index funds and stock market growth", *Journal of Business*, Vol. 76, pp. 1-28.

Gompers, Paul A., Metrick, A. (2001), "Institutional investors and equity prices", *Quarterly Journal of Economics,* Vol. 116, pp. 229-259.

Grinblatt, M., Titman, S. and R. Wermers. (1995), "Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior." *American Economic Review*, Vol. 85, No. 5, pp. 1088-1105.

Harris, L and Gurel, E. (1986). "Price and volume effects associated with changes in the S&P 500: New evidence for the existence of price pressures", *Journal of Finance*, Vol. 41, pp. 815-829.

Lee, C., Shleifer, A., Thaler, R. (1991), "Investor sentiment and the closed-end fund puzzle", *Journal of Finance*, Vol. 46, pp. 75-109.

Mukherjee, P., Bose, S., and Coondoo, D. (2002), "Foreign Institutional Investment in the Indian Equity Market- An Analysis of Daily Flows During January 1999- May 2002", *Money and Finance,* Vol. 2, pp. 9-10

Mukherjee, P. and Roy, M. (2011), "The nature and determinants of investments by institutional investors in the Indian stock market", *Journal of Emerging Market Finance*, Vol. 10, No. 3, pp. 253-283.

Nofsinger, John R. and Sias, R. W. (1999), "Herding and feedback trading by institutional and individual investors", *The Journal of Finance*, Vol. 54, No. 6, pp. 2263-2295.

Rakowski, D. and Wang, X., (2009), "The dynamics of short-term mutual fund flows and returns: A times-series and cross-sectional investigation", *Journal of Banking and Finance*, Vol. 33, pp. 2102-2109.

Oh, N.Y. and Parwada, J.T. (2007), "Relations between Mutual Fund Flows and Stock Market Returns in Korea", *Journal of International Financial Markets, Institutions & Money* Vol.17, No. 2, pp. 140-151.

Sehgal, S. and Tripathi, N. (2009), "An Examination of Home Advantage (Bias) Argument in the Indian Financial Markets: Domestic Financial Institutional Investors (DFIIs) Vis-a-Vis Foreign Institutional Investors (FIIs)", *Asian Journal of Finance & Accounting*, Vol. 1, No. 2, pp. 163-174.

Shleifer, A., (1986), "Do demand curves for stock slope down?" *Journal of Finance*, Vol. 41, pp. 579-590.

Thenmozhi, M., and Kumar, M., (2009), "Dynamic Interaction among Mutual Fund Flows, Stock Market Return and Volatility", NSE Working Papers.

Thiripalraju, M., and R. Acharya (2011), "Dynamic Interaction between Institutional Investment and Stock Returns in India: A Case of FIIs and MFs", Indian Institute of Capital Markets.

Warther, Vincent A., (1995), "Aggregate Mutual Fund Flows and Security Returns", *Journal of Financial Economics*, Vol. 39, No. 2-3, pp. 209-235.

Wermers, R. (1999), "Mutual Fund Herding and the Impact on Stock Prices." *Journal of Finance* Vol. 54, No. 2, pp. 581-622.

Yan, X. and Zhang, Z. (2009), "Institutional investors and equity returns: Are short-term institutions better informed?", *The Review of Financial Studies*, Vol. 22, No. 2, pp. 893-924.