Institutional Investments and Their Influence on Stock Returns – An Empirical Study

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ABSTRACT

Mutual dependency of market variables is crucial for development of any economy. It is equally important to study the stock market for what parameter influences over the others and for what length of time, thus giving direction to investors. Further, Sensex being an important barometer of India's economic measurement, it would be interesting to know the revelation of its stability while institutional investors influence it in multiple ways over considerable longer period of economy. This study investigates the influence of FII and MF on Sensex over 11 year period between 2004-2015. The objectives were to find out the dependency among the three to conclude about which out theses influences market the most. On applying Unit–root test, Correlation and VAR, the study revealed that there was a regime change for BSE-Sensex returns due to the global recession. The noticeable fact is that change in regime affected the purchase of Mutual Fund which led to increasing in FII investment. The variation in the investment patterns by institutions brought in heavy market movement. Indian stock market during the selected period was driven by a greater amount of Foreign Investors compared to the domestic investors, the Mutual Fund taken up for this study.

Keywords: institutional investors, investment dependency, market movement, market stability, Regime change.

JEL classification: G1, G11, G17, G23

1. INTRODUCTION

India since globalisation has amplified the movement of funds globally as well as internally by introducing innovative financial products and occupying the 21st place in most of Emerging Market Economies[1] (EMEs), which help a modern investor to get maximum returns through various challenges. One such challenge faced by domestic investors (eg. Mutual Fund- MF) is when they source funds locally and invest them in equities to increase the returns. On the other hand, foreign investors (FII) raise the fund across the globe and try to increase their Return on Investment. In this case the institutional investors play an iconic role in flaring the market of developing countries. The trade of Foreign Institutional Investors (FII) intensify not only the unpredictability in the investors' returns but also the movement of index while the investments of mutual funds have also regularly thrown surprises in the stock market.

This study considers the movement of MF and FII in relation to Indian stock market taking market movements into consideration over FII, MF and the Sensex returns. The purpose of this study is to know how Indian stock market index, in this case, the BSE Sensex responds to MF and FII investments.

1.1 The Pertinent Research Questions

This study has the objective to answer the following questions:-

- Which variable emerges out to be dependent or self-reliant among the three chosen measurements?

- What type of investment has what kind of relation with the selected measurement?

2. REVIEW OF LITERATURE

Domestic studies in the past have revealed that there has been a positive relation among FII & MF. Many other studies have found that FII investments depended upon the Indian market performance. Some more domestic studies have also concluded that investment of MFs does notaffect the investment pattern of FII in India.

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[1] India- incredible investment destination, fact book, Dept. of Economic Affairs, Government of India p15

The present study undertaken by the scholars found wide variation and gaps among the findings and results contravening the above conclusion and inferences. Thus the following review of literature is recorded under this study with fact finding objectives.

Bodla & Kumar (2009) applied Granger Causality test and found that the net investment made by the foreign institutional investors in Indian stock market was proved as a casual force of market capitalization in the case of trading volume. The increased FII's investment led to increasing in trading volume.

A study (Bulsara, Dhingra, & Gandhi, 2015) on the flow of Foreign Institutional Investments and stock market returns found that FII increased remarkably from the 1990sonwards which led to increasing in forex reserve and higher value in Indian capital market. Here, the investment made by FII increased volatility. On applying Cross-Correlation Function (CCF) approach, Granger Causality Test and Vector Auto Regression after taking a Global financial crisis, the result observed that there was an interaction between FIIs and Nifty returns.

Dandapani & Lawrence (2013) established that Indian stock market returns to net FI investments in India had both significant and incremental effect on the returns of Indian stocks. Further, the high-interest rate in India, strong dollar and high US inflation directed a decrease in the investments of FII.

Garg & Mitra (2015) attempted to evaluate the investment pattern of FIIs' investments and the relation with Indian stock market returns. They concluded that FIIs created short-term volatility. FIIs' bought more than selling and was vulnerable in case of price efficiency.

When investment technology of foreign versus domestic investors is compared (Patnaik & Shah, 2013) with a focus on decomposing outcomes attributable to asset allocation and security selection, it displayed significant differences in exposure to systematic asset pricing factors between foreign and domestic investors. The results showed that foreign investors in India fare poorly at security selection, while domestic investors farewell.

An analysis (Ray, 2009) on the relationship between foreign institutional investment and stock returns in India (BSE) shows that equity returns caused FII flows into Indian markets but FII flows did not cause equity returns in the Indian stock market. FII investments may be inclined by the previous few days of trading returns and are also influenced by the next trading day's expected returns of the stock market.

On an investigation (Thiripal raju & Acharya, 2013) about the interaction between institutional investment and market return in Indian stock market, the empirical result showed that FIIs investment is positively related to the lagged market return whereas MFs investment is negatively related to it. Impulse response analysis confirms that impact of shock to market return is more lasting on institutional investment than the other way round. A sub-period analysis confirmed that relationship between FIIs flows and market return did not change significantly during the study period in comparison with MFs.

Tripathi & Maggo (2015) applied impulse response analysis to estimate the short, as well as the long run relationship among the FII,flows in two markets. There waspositive and high correlation between FII flows in theequity market and in debt market of India. The analysis revealed that FII flows to debt market are significantly responsive to a shock in FII flows to equity market and vice-versa.

(Jangra, 2013) concluded that FII trading activity dampens the market volatility and DII exacerbates market volatility and found that the positive shocks in the trading will have more impact than the negative shocks. In thecase of DII trading, it has led to adisproportionate response in the stock market.

Paramita Mukherjee, (2002) found that FII purchase and sales were dependent on the performance of India's equity market and they established that FII flows were highly auto-correlated. FII flows caused returns of domestic investors.

Sehgal and Tripathi (2009) used herding method proposed by Lakonishok, Shleifer and Vishny evaluated that FIIs exhibit return-chasing behaviour when monthly data sets were used whereas daily investments of FII did not react to the market information instantly.

A study (Singh, 2014) explored that FIIs played a very important role in Indian stock market and FII injected liquidity and growth in stock markets but at the same time they also inoculated volatility in the stock market. Further concluded that investment of Mutual funds did not affect the investment pattern of FII in India, but the movement of Sensex affected the investment of FIIs.

Sumanjeet and Paliwal (2010) observed that policy of the government, tax code and economic condition significantly affected the movement of the stock index.

Sundaram, (2009) conducted Granger Cointegration and Granger Causality testand found thatthere was no long-runrelationship among foreign exchange and FII. In thecase of Granger Causality, its was found to have unidirectional causality between them.

3. SOURCES OF DATA

The secondary data for the purpose of this scientific study were collected from the official websites of BSE, SEBI and NSDL and the variables were synchronised as suitable for the study.

3.1 Basic Data:

This study examines the effect of the institutional investment on BSE-Sensex. In this regard, Stock returns were measured using the daily closing prices of the stock index.

3.2 To calculate stock index returns:

Daily Rate of Return = $(P_t / P_{t-1}) * 100$

Where ln P_t is the closing Index of the day, and
Pt-1is the closing Index of previous day

3.3 Mutual Fund (MF) and Foreign Institutional Investors (FII):

In the case of MF and FII, daily Gross Purchases & Gross Sales were considered for the study. MF & FII values were gathered from SEBI. The Investments are expressed in Crores`.

The investment values are expressed by the natural log of Mutual Fund Gross Purchases, natural log of Gross Sales (**MFGP_LN & MFGS_LN**) and natural log value of Foreign Institutional Investments (**FIIGP_LN &FIIGS_LN**).Data sets are synchronised& ensured that the trading days of both time-series are matched. A period of 11 years starting from January 2004 to Dec 2015 was taken for the study. There is atotal of 2,969 observations representing all the trading days gathered and analysed using MS-excel &Review statistical package.

4. RESEARCH OBJECTIVE AND METHODOLOGY:

4.1 Research objective

    i. To determine the relationship between FII and MF investments and the Sensex returns.
    ii. To find whether FII or MF investments drive the Indian stock market.

4.2 Methodology

This study examines the effective power of three variables such as Sensex return values, logged investments of FII and logged investments of Mutual Fund. At the point of beginning of this study, BSE Sensex index was chosen to be a dependent variable and the logged investments of FII, as well as the logged investments of Mutual Fund, were taken as predictor variables.

4.21 Stationary Test &Unit root

Stationary of a series is a stochastic process and plays a vital role in time series, as it influences ordinary least square and generates spurious regression. It is a process of checking mean& variance over a period of time and if mean and variance of a series are constant over a period of time then the variables become stationary and hence ready for further statistical test and model building.

The Unit Root presence is tested through the **Phillips–Perron test**

$$y_t = \alpha + \rho y_{t-1} + \varepsilon$$

The hypothesis for this test is

H_0 : $\rho = 1$ i.e. time series is non-stationary

H_1: $\rho < 1$ i.e. time series is stationary

4.22 Vector Auto Regression

VAR model is composed of a system of regressions in which the dependent variables are expressed as a function of their own and each other's lagged values and possibly some other control variables (Enders, 2004). This methodology has proven especially useful for forecasting systems of interrelated time-series variables when the exact theoretical nature of the relationship is dull-witted. The attractive feature of VAR analysis that allows each variable in the system to be treated symmetrically is applicable under this study too. A general unrestricted pa[th]-order Gaussian VAR (p) model can be represented as:

$$y_{it} = c + a_1 y_{it-1} + a_2 y_{it-2} + \ldots\ldots\ldots + a_k y_{it-p} + \varepsilon_t$$

Where, y_{it} is a vector of variables, c is a *pX1* vector of intercepts, a_1 a_2 a_3 & a_k are *pXp* matrices of parameters, ε_t is a vector of uncorrelated structural shocks.

4.23 Lag Length VAR (p)

As a successful model depends on a right number of lags, too many lags included make the model less effective and the estimators inefficient. Hence the essentiality to define a comprehensive model herein adopted the VAR model. In this study, lag length was considered on the basis of Akaike Information Criterion (AIC).

4.24 Impulse response function

Impulse response serves as an important function, which allows to trace the path, time and impact of an innovation in one variable on all other variables included in VAR model. A change in error term will change the future value of other variables. These innovations (i.e. errors) are usually correlated. In this study, innovations were checked for LM correlation test, which is statistically significant and Cholesky decomposition method has been used.

5. EMPIRICAL RESULTS

5.1 Unit root test

Table-1: UNITROOT TEST

TABLE-1:		Phillips-Perron Test				
H_o: variables has a unit root				H_1: variables are stationary		
Variable		**t-Statistic**	**Prob.***	**1%**	**5%**	**10%**
SENSEXR$_t$	Trend & Intercept	-50.83480	0.0000	-3.961129	-3.411318	-3.127502
MFGP_LN	Trend & Intercept	-55.25744	0.0000	-3.961129	-3.411318	-3.127502
MFGS_LN	Trend & Intercept	-59.80284	0.0000	-3.961129	-3.411318	-3.127502
FIIGP_LN	Trend & Intercept	-48.02861	0.0000	-3.961129	-3.411318	-3.127502

FIIGS_LN	Trend & Intercept	-46.24249	0.0000	-3.961129	-3.411318	-3.127502

* indicates test significance at all levels.

Table 1 presents the results of Phillips-Perron Test for SENSEXR$_t$ along with portfolio investments, i.e. MFGP_LN, MFGS_LN, FIIGP_LNand FIIGS_LN. All the variables were stationary at level.

5.2 Multiple Breakpoint tests
6   Table 2: Sequential F-statistic determined breaks

Break Test	F-statistic	Scaled F-statistic	Critical Value**
0 vs. 1 *	6.510127	32.55064	18.23
1 vs. 2	2.720667	13.60334	19.91

Break dates

	Sequential	Repartition
1	03/08/2009	03/08/2009

* Significant at the 0.05 level.
** Bai-Perron (Econometric Journal, 2003) critical values.

The Bai-perron sequential break table shows that there was a sequential break in SENSEXR$_t$ on August 03rd, 2009 as per F- Stats. The break is the outcome of the Global Slowdown at the time, which is a visible regime change.

6.2 Descriptive statistic
7   Table – 3 Descriptive stats

	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Observations
From 02-01-2004 To 31-07-2009						
SENSEXR$_t$	0.000914	0.018390	-0.079726	5.325170	312.3309	1380
MFGP_LN	2.605616	0.345532	-1.003048	6.047166	765.3041	1380
MFGS_LN	2.584366	0.335832	-1.508820	10.67863	3913.884	1380
FIIGP_LN	3.201878	0.329918	-0.819835	5.738907	585.9325	1380
FIIGS_LN	3.159722	0.357242	-1.026807	7.152969	1234.208	1380
From 03-08-2009 To 31-12-2015						
SENSEXR$_t$	0.000389	0.010592	-0.111915	4.371194	127.8002	1589
MFGP_LN	2.764333	0.280102	-3.791414	42.96651	109563.0	1589
MFGS_LN	2.770656	0.265852	-4.768386	42.73935	110578.9	1589
FIIGP_LN	3.482812	0.193061	0.079847	5.112998	297.2929	1589
FIIGS_LN	3.442020	0.198709	-0.066327	5.182518	316.5409	1589

The table represents average returns, investments and variation of the three variables. Sensex returns have decreased after the break date (03-08-2009), average gross purchases and sales of FII and MF had increased. Skewness and Kurtosis explain about symmetry and shape of the above distribution, the skewness is along tail to the left; the values are negativelyskewed; however natural log of FII-Gross Purchases is along tail to the right and are positively skewed. In the case of kurtosis, variables are greater than 3, which demonstrate its response from the impacts of any latest information to the stock market. Jarque-Bera's p-value is far smaller than the significance level, so it doesn't conform to the normal distribution.

7.2 Correlation analysis

Table-4: Correlation

Correlated Pair		From 02-01-2004 To 31-07-2009	From 03-08-2009 To 31-12-2015
	MFGP_LN	-0.0132	-0.0028
	MFGS_LN	0.0512	0.0659
SENSEXR$_t$	FIIGP_LN	0.0054	0.0486
	FIIGS_LN	-0.07400	-0.0037

Correlated Pair		From 02-01-2004 To 31-07-2009	From 03-08-2009 To 31-12-2015
	MFGS_LN	0.8407	0.7223
MFGP_LN	FIIGP_LN	0.6352	0.2834
	FIIGS_LN	0.6513	0.3721

Correlated Pair		From 02-01-2004 To 31-07-2009	From 03-08-2009 To 31-12-2015
	FIIGP_LN	0.6586	0.2687
MFGS_LN	FIIGS_LN	0.6331	0.2158

Table-4 explains the relation between the variables. Sensex shares positive low level of relation with MF and FII Gross Sales and Purchases. MF Gross Purchases and Gross Sales have a positive relation with FII Gross Purchases and Sales during 2004-2009 and the relation decreased during 2009-2015. In case MF gross sales relation with FII gross purchases and sales has reduced drastically from high positive correlation to low correlation during 2009 to 2015.

7.3 VAR (p)

8   **Table-5: VAR Lag Order Selection Criteria**
9   **From 02-01-2004 to 31-07-2009**

Endogenous variables: **SENSEXR$_t$, MFGS_LN, MFGP_LN, FIIGP_LN, FIIGS_LN.**

Lag	LogL	LR	FPE	AIC	SC	HQ
0	4300.031	NA	1.31e-09	-6.260978	-6.241940	-6.253854
1	5665.370	2718.736	1.86e-10	-8.214825	-8.100597	-8.172081
2	5784.542	236.4322	1.62e-10	-8.352101	-8.142684*	-8.273737
3	5868.274	165.5125	1.49e-10	-8.437718	-8.133110	-8.323734
4	5934.786	130.9880	1.40e-10	-8.498231	-8.098433	-8.348627
5	5997.551	123.1502	1.33e-10	-8.553281	-8.058293	-8.368057*
6	6033.784	70.82969	1.31e-10*	-8.569656*	-7.979479	-8.348813
7	6058.675	48.47421	1.31e-10	-8.569496	-7.884129	-8.313033
8	6078.395	38.26221*	1.32e-10	-8.561800	-7.781243	-8.269716

10

11

From 03-08-2009 to 31-12-2015

Lag	LogL	LR	FPE	AIC	SC	HQ
0	7049.406	NA	9.28e-11	-8.911330	-8.894360	-8.905025
1	7966.591	1827.407	3.00e-11	-10.03996	-9.938145	-10.00213
2	8088.312	241.7482	2.66e-11	-10.16232	-9.975651*	-10.09296
3	8156.935	135.8569	2.51e-11	-10.21750	-9.945986	-10.11662
4	8224.423	133.1841	2.38e-11	-10.27125	-9.914887	-10.13884
5	8293.954	136.7750	2.25e-11	-10.32758	-9.886371	-10.16365*

6	8316.828	44.85148	2.26e-11	-10.32489	-9.798833	-10.12943
7	8329.561	24.88478	2.29e-11	-10.30937	-9.698466	-10.08239
8	8369.500	77.80653*	2.25e-11*	-10.32827*	-9.632516	-10.06976

 * indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level),

FPE: Final prediction error

AIC: Akaike information criterion, SC: Schwarz information criterion &

HQ: Hannan-Quinn information criterion

VAR Lag Order Selection Criteria is considered by taking AIC value so that a dynamic VAR model can be built.

5.6 Variance Decomposition

Table-6: Variance Decomposition

From 02-01-2004 to 31-07-2009

Variance Decomposition of FIIGP_LN:

Period	S.E.	FIIGP_LN	MFGP_LN	MFGS_LN	FIIGS_LN	SENSEXR$_t$
1	0.155655	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.199788	63.58865	31.13000	5.086016	0.009957	0.185378
3	0.207254	60.94498	33.05794	5.772843	0.051857	0.172379
4	0.210160	60.17024	33.53553	5.834733	0.236680	0.222814
5	0.214350	59.42212	33.45292	6.197897	0.697225	0.229841
6	0.218743	58.67638	33.98509	6.190279	0.672768	0.475484
7	0.223704	57.16111	34.87951	6.355401	0.654997	0.948989
8	0.228565	56.04782	35.64753	6.699720	0.628189	0.976743
9	0.233878	54.63808	36.82455	6.955363	0.618185	0.963824
10	0.237882	53.50054	37.64880	7.285615	0.628299	0.936748

Variance Decomposition of MFGP_LN:

Period	S.E.	FIIGP_LN	MFGP_LN	MFGS_LN	FIIGS_LN	SENSEXR$_t$
1	0.219133	0.005933	99.99407	0.000000	0.000000	0.000000
2	0.227702	0.005666	99.62204	0.000336	0.196880	0.175077
3	0.231503	0.015459	99.51691	0.066788	0.213915	0.186926
4	0.233887	0.024214	99.46640	0.099611	0.224079	0.185698
5	0.237664	0.081114	99.25774	0.244196	0.230533	0.186413
6	0.243007	0.108600	98.13688	0.648387	0.370690	0.735448
7	0.247607	0.161715	98.00213	0.702291	0.361944	0.771916
8	0.253920	0.604126	97.28745	0.766583	0.428042	0.913802
9	0.258312	0.711008	96.98650	0.936305	0.482973	0.883215
10	0.261948	0.799594	96.74129	1.099932	0.495746	0.863439

Variance Decomposition of MFGS_LN:

Period	S.E.	FIIGP_LN	MFGP_LN	MFGS_LN	FIIGS_LN	SENSEXR$_t$
1	0.217066	0.655570	44.82695	54.51748	0.000000	0.000000
2	0.222698	0.841614	44.26609	54.58943	0.302106	0.000764
3	0.226130	0.877978	44.93225	53.25491	0.552433	0.382425
4	0.229650	0.999303	44.93625	52.62139	1.002652	0.440406
5	0.234224	1.197946	45.60264	51.46444	1.181712	0.553261
6	0.239317	1.250518	45.78961	50.80273	1.185341	0.971794
7	0.244360	1.504015	46.58024	49.74722	1.163773	1.004756
8	0.249604	2.134616	46.88797	48.64667	1.118345	1.212392
9	0.253367	2.310678	47.52388	47.84214	1.146600	1.176698
10	0.256714	2.470795	48.11025	47.10148	1.169905	1.147576

Variance Decomposition of FIIGS_LN:

Period	S.E.	FIIGP_LN	MFGP_LN	MFGS_LN	FIIGS_LN	SENSEXR$_t$
1	0.166141	52.79990	0.135720	0.450252	46.61413	0.000000
2	0.208516	34.82667	30.34409	2.969580	31.66157	0.198083

3	0.215384	33.98073	31.82705	3.933775	30.06919	0.189253
4	0.217602	33.81552	32.20498	4.023096	29.77059	0.185812
5	0.220748	34.06742	32.31309	4.399256	29.00848	0.211747
6	0.226779	33.56374	33.35908	4.776989	27.95851	0.341683
7	0.232695	32.32084	35.09273	4.824819	26.86946	0.892150
8	0.237305	32.06349	35.60226	5.124502	26.30702	0.902728
9	0.242990	31.47668	36.95433	5.495553	25.18109	0.892340
10	0.247355	30.94779	37.92319	5.925950	24.33749	0.865584

Variance Decomposition of SENSEXR$_t$:

Period	S.E.	FIIGP_LN	MFGP_LN	MFGS_LN	FIIGS_LN	SENSEXR$_t$
1	0.017550	0.016132	0.020799	1.594619	1.795926	96.57252
2	0.017829	0.042039	0.080843	1.805872	4.447332	93.62391
3	0.017970	0.045315	0.199182	1.884891	5.247420	92.62319
4	0.018130	0.339466	0.956740	1.975417	5.724092	91.00429
5	0.018236	0.610253	0.979085	2.226970	6.186012	89.99768
6	0.018490	0.613629	1.179829	4.570088	6.034942	87.60151
7	0.018608	0.841277	1.164891	4.644870	5.960245	87.38872
8	0.018616	0.841294	1.170667	4.705871	5.960597	87.32157
9	0.018619	0.842965	1.187718	4.710923	5.963536	87.29486
10	0.018621	0.842924	1.190966	4.726360	5.967250	87.27250

Cholesky Ordering: FIIGP_LN MFGP_LN MFGS_LN FIIGS_LN SENSEXRT

From 03-08-2009 to 31-12-2015

Variance Decomposition of MFGS_LN:

Period	S.E.	MFGS_LN	MFGP_LN	FIIGS_LN	FIIGP_LN	SENSEXR$_t$
1	0.241260	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.245927	99.60001	0.152514	0.112206	0.072521	0.062744
3	0.248865	98.72273	0.703089	0.170327	0.339746	0.064108
4	0.250862	98.02127	0.759144	0.281465	0.821722	0.116404
5	0.252737	97.13272	0.752583	0.525712	1.427512	0.161478
6	0.254903	96.63721	0.909740	0.535815	1.716448	0.200789
7	0.255832	96.55262	0.906108	0.541883	1.790506	0.208880
8	0.256946	96.07982	0.930664	0.543309	2.236737	0.209468
9	0.258536	95.53422	1.272960	0.618758	2.366245	0.207821
10	0.259230	95.25678	1.389569	0.650229	2.492317	0.211109

Variance Decomposition of MFGP_LN:

Period	S.E.	MFGS_LN	MFGP_LN	FIIGS_LN	FIIGP_LN	SENSEXR$_t$
1	0.236059	55.98116	44.01884	0.000000	0.000000	0.000000
2	0.243216	56.10206	43.07313	0.308247	0.504741	0.011822
3	0.247204	55.76784	43.05058	0.316525	0.853611	0.011445
4	0.250134	55.18588	42.83437	0.986849	0.837429	0.155469
5	0.253107	54.61605	42.21411	2.103442	0.831120	0.235282
6	0.256466	54.28836	42.26158	2.373051	0.811771	0.265239
7	0.258884	54.23108	42.37273	2.329820	0.797313	0.269062
8	0.260114	53.99365	42.56703	2.308640	0.802791	0.327887
9	0.263943	53.50631	42.36935	3.018577	0.785118	0.320641
10	0.266216	53.17927	42.25757	3.464306	0.775079	0.323774

Variance Decomposition of FIIGS_LN:

Period	S.E.	MFGS_LN	MFGP_LN	FIIGS_LN	FIIGP_LN	SENSEXR$_t$
1	0.142076	0.374238	0.169158	99.45660	0.000000	0.000000
2	0.155018	4.038071	1.938190	93.81851	0.138807	0.066422
3	0.162420	5.597257	2.914469	91.08371	0.232535	0.172027
4	0.165157	6.488671	2.973211	90.04827	0.242584	0.247268
5	0.169934	7.374519	2.850022	89.21079	0.238814	0.325857
6	0.173736	7.815047	2.940026	88.55904	0.333396	0.352489
7	0.176873	8.083599	3.573889	87.48817	0.326430	0.527915
8	0.179339	8.164442	4.143039	86.60225	0.493456	0.596813

9	0.181569	8.005457	4.576000	85.98762	0.721179	0.709742
10	0.183672	8.087480	4.948147	85.34740	0.893233	0.723738

Variance Decomposition of FIIGP_LN:

Period	S.E.	MFGS_LN	MFGP_LN	FIIGS_LN	FIIGP_LN	SENSEXR$_t$
1	0.143742	0.953303	0.389863	67.16051	31.49633	0.000000
2	0.155634	4.853220	1.549027	63.40899	30.04320	0.145563
3	0.162116	6.514235	2.343433	61.35270	29.51628	0.273350
4	0.165371	7.685487	2.311094	59.74326	29.82371	0.436447
5	0.169337	8.604866	2.218564	59.78821	28.82588	0.562486
6	0.173733	9.228713	2.172505	59.15616	28.77301	0.669615
7	0.176370	9.671318	2.420927	58.65331	28.54721	0.707244
8	0.178707	9.715618	2.830842	57.99334	28.66573	0.794465
9	0.180930	9.497015	2.974275	57.33087	29.28829	0.909551
10	0.182883	9.502711	3.135232	56.82399	29.61312	0.924947

Variance Decomposition of SENSEXR$_t$:

| Period	S.E.	MFGS_LN	MFGP_LN	FIIGS_LN	FIIGP_LN	SENSEXR$_t$
1	0.009727	0.145449	0.038934	0.081728	0.000173	99.73372
2	0.009760	0.182575	0.181962	0.215290	0.017411	99.40276
3	0.009788	0.280790	0.213545	0.214325	0.017972	99.27337
4	0.009843	0.384222	0.686564	0.263699	0.063244	98.60227
5	0.009940	0.480623	0.815010	0.564962	1.432168	96.70724
6	0.010359	0.456124	1.075805	0.731174	8.665143	89.07175
7	0.010522	0.502550	1.053868	0.766954	11.34439	86.33224
8	0.010622	0.524572	1.039378	1.153798	12.56659	84.71566
9	0.010680	0.522928	1.530710	1.183478	12.78833	83.97455
10	0.010683	0.548227	1.531433	1.186029	12.79184	83.94247

Cholesky Ordering: MFGS_LN MFGP_LN FIIGS_LN FIIGP_LN SENSEXR$_t$

The study aims at finding Variance Decomposition of each variable for about 10 days based on Cholesky Scale. As per table-6, during 02-01-2004 and 31-07-2009, FII Gross Purchases was self-reliant to a large extent (54 percent)for purchases however it still depended on Mutual Fund Gross Purchases to a fair extent (38 percent). Whereas Mutual Fund Gross Purchases was almost self-dependent (97 percent) but depended to a feeble extent on other variables (3 percent). Nearly a half of Mutual Fund Gross Sales was effected by its own Purchases (48 percent) and almost another half by its own Sales (47 percent). It depended least on FII Purchases (2.47 percent). More than a third of FII Gross Sales are caused by MF Gross Purchases (38 percent); nearly another third of the Sales were caused by FII Gross Purchases (31 percent), self-dependent to a fair extent (27 percent) and least on remaining variables (4 percent). In the case of Sensex Returns are largely affected (87 percent) by its movement; another variable such as FII Gross Sales (6 percent), MF Gross Sales (5 percent),but least dependent on remaining variables (2 percent).
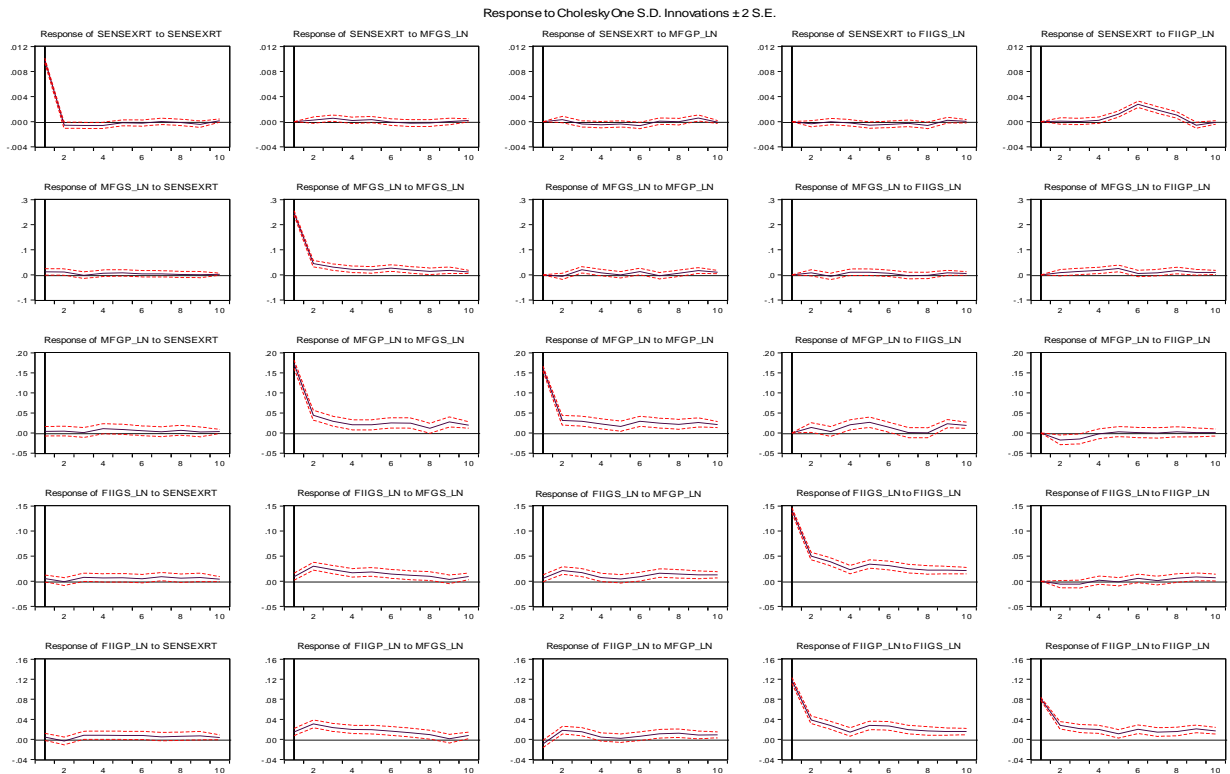
Between 03-08-2009 & 31-12-2015, Variance Decomposition for MF Gross Sales shows that it largely depended on itself (95 Percent) and very little relied on FII Gross Purchase (3 Percent), and very meagrely on other variables (2 Percent).In the case of MF Gross Purchases, more than half of it got effected by MF Gross Sales (53 Percent), it was self-reliant to nearly half of it (42Percent)and got least effected by other variables (5 Percent). On the other hand, FII Gross Sales depended upon itself to a large extent (85 Percent),got effected a bit by MF Gross Sales (8 Percent), by MF Gross Purchases upto5% and by FII Gross Purchases – 1%, also by Sensex Returns upto 1%. More than half of FII Gross Purchases got effected by FII Gross Sales (57 Percent), it was self-dependent to nearly a third of itself (29 Percent), by MF Gross Sales upto10%, by MF Gross Purchase – 3%, Sensex Returns– 1%.In the case of Sensex returns, it was almost self-reliant (84 Percent), a quarter of it got effected by FII Gross Purchase (13 Percent), and by other variables upto 3%.

5.7 Impulse response function

Figure -1

From 02-01-2004 to 31-07-2009

Response to Cholesky One S.D. Innovations ± 2 S.E.
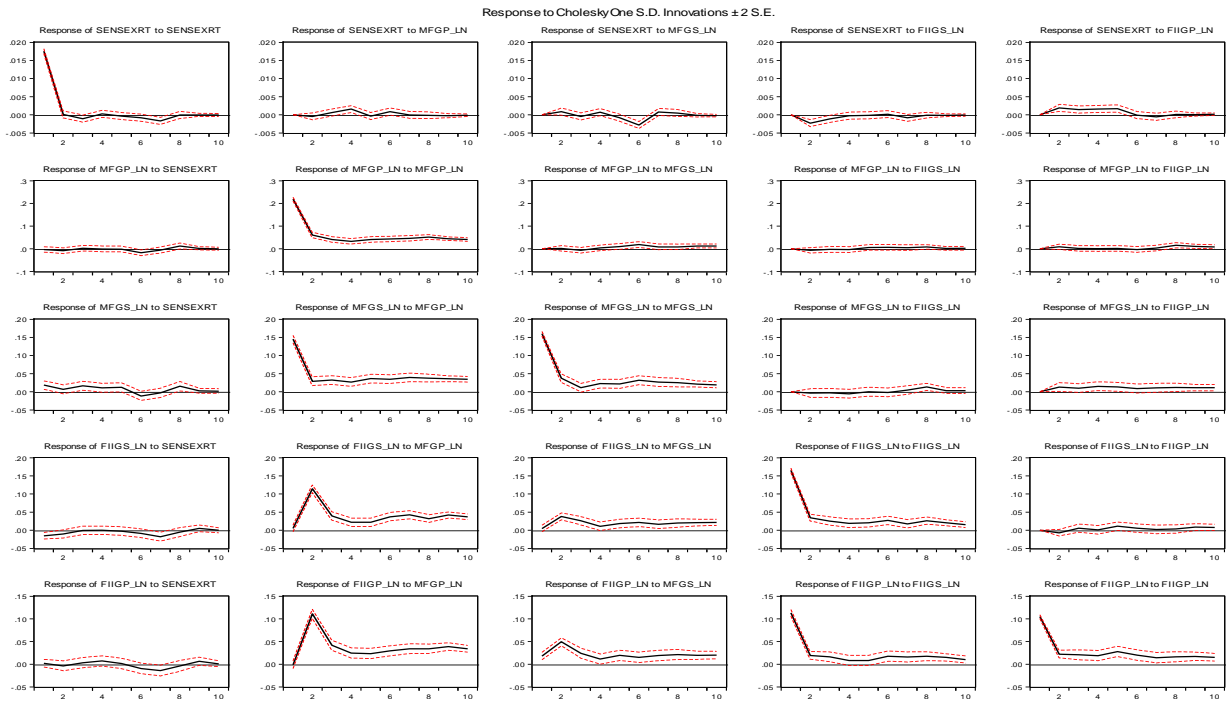
Figure -2

From 03-08-2009 to 31-12-2015

Response to Cholesky One S.D. Innovations ± 2 S.E.

Analysis

The Impulse Response Function for the period between 02-01-2004 to 31-07-2009 shows that when there was a decrease in Sensex Returns, it did not evoke any favourable response from both the investors of MF and FII to either sell or purchase the securities. But, when there was a change in FII Purchases, Sensex Returns increased for quite a while, also correspondingly MF responded mildly by selling. Also, change in MF Purchases tended to change in purchases by foreign institutions thereby Sensex Returns did not react. It is to observe that any change in MF Sales had resulted in the purchase by foreign investors thereby creating volatility in Sensex Returns. However, when there is a change in FII Sales, it has led to negative Sensex returns and MF were inactive.

During 03-08-2009 to 31-12-2015, however, a decrease in Sensex Returns led to MF purchases. When FII indulged in Purchases, MF Sales did not respond even though the status of Sensex Returns remained the same. The market has recovered as Sensex returns reacted positively towards MF purchases and there was also a corresponding change in FII purchases. MF investors were not keen on participating in the market but FII showed interest in investing in Indian markets rather than selling their investments. However, immediate sales of FII is observed however not over along period.

6. FINDINGS

To make an empirical model effective, it is pertinent that stability of the variable is checked. In this study, it was found that there was a break in the data (as per Bia-Perron Test) due to an economic slowdown across the globe once during the period chosen for the study. Hence the variables were divided into two groups for the analysis.

Average Sales and Purchases of FII and MF got increased (during 2009-2015). But Sensex Returns decreased during this time. Mutual Fund and FII Purchases and Sales earlier had a positive relation amongst themselves but later the relation decreased however remained positive. MFGP and FIGS had a negative relation with Sensex Returns right from the beginning until the end of measurement in this study.

In the beginning, Sensex Returns was self-reliant (87%) for its performance in the market during the period taken for the study and later its reliance on itself fell marginally (84%). Mutual Fund Gross Sales were not much self-reliant before (47%) but became almost self-reliant later (95%). MF Gross Purchases were earlier very self-reliant (97%) but later was caused by other variables (42%). FII Gross Sales during the earlier period of study was considerably effected by MF Gross Purchases (38%) but later managed to be self-reliant (85%). FII Gross Purchases was initially effected by MF Gross Purchases (38%) and later was majorly effected by FII Gross Sales (57%).

In the earlier period under this study, to begin with, Sensex Returns appeared stable. But soon due to considerable selling activities of Foreign Institutional Investors, there was a perceived variation in Sensex Returns and soon declined notably. While such a decline continued, the scenario benefitted Mutual Fund and Foreign Institutional Investors to invest in the market.

7. CONCLUSION

On observing the behaviour of the market variables, Indian investors seem to be not proactive in playing in the market when Mutual Fund interacts with the market, but when FII interacts with the market, investors are keen on the behaviour of the market.

When there is a slow-down in the economy, the market returns and the activities of Mutual Fund or Foreign Institutional Investors will reduce and while in the recovery process of the economy, their purchasing activity shall increase.

It is observable from the study that Mutual Fund and FII share a fair amount of good relation among themselves. Any variation in this relation may cause volatility in the market.

It is well known now that Indian stock market is driven by more of outsiders, i.e., Foreign Investors rather than domestic investors, i.e., Mutual Fund. It is high time, the government takes some initiatives to improve domestic investments so that market stability can be restored.

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