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Impact of Foreign Institutional Investment in India on Indian Financial and Macroeconomic System

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ABSRACT: The study found that a bi-directional causality exists between stock prices (Sensex) and net investment of Foreign Institutional Investors (FIIs). Thus, FIIs indulge in 'momentum' or 'positive feedback' trading hypothesis. Indian macroeconomic system has also been observed as bearing the heat of FIIs activities. Further, herd behaviour of FIIs prevails significantly in Indian stock market. During adversity, the chances of instability are higher since it is the sell herd which has been found to be more pronounced and may eventually end up in financial crisis. The study concludes that FIIs investment is a major factor behind both financial and macroeconomic instability in India.

KEYWORDS: Unit root, Order of Integration, Causality, Momentum or Positive Feedback Hypothesis and Herding.

I. INTRODUCTION

Consequent to balance of payment crisis in 1990-91, India was forced by International Monetary Fund (IMF) to adopt an adjustment programme consisting of both stabilisation and structural reforms. As a part of structural reforms, India liberalised its foreign investment policy. This liberalisation of foreign investment led to abolishment of barriers with regard to capital inflows and foreign exchange controls. Financial liberalisation process of India since 1990 is a step toward globalisation of Indian economy. Financial globalisation which is the outcome of liberalisation of foreign investment policy has serious implications, especially the opening up of Indian stock market to foreign institutional investors. Foreign Institutional investment may result in high volatility of domestic stock market prices and also it has significant bearing upon the macroeconomic variables which may result in financial crisis. FIIs were permitted to invest in all the listed securities traded in Indian Capital market for the first time in Sept, 1992. Since Sept, 1992 the regulations with regard to FIIs investment has become more liberal. As a result of abolishment of capital inflow barriers, India experienced unprecedented surge in capital inflows from developed countries. At the same time, these massive capital inflows raised various concerns with regard to absorptive capacity of Indian financial system. The various burning issues such as whether these capital inflows are sustainable or not, will depend upon the efficiency of stock market and prudence exercised with regard to formulation of macroeconomic and exchange rate policies in the light of huge capital inflows. But the weak form of efficiency as has been confirmed (Kaur and Dhillon, 2011,[1]) may be restricted only to economies where financial system is not open to foreign investors, but the Indian financial system is now open to investments by foreign investors, so it is pertinent to test the higher form of efficiency. In the liberalised financial system with huge capital inflows, semi-strong of efficiency hypothesis seems to be more relevant. If the stock market is efficient in its semi-strong form, the absorptive capacity of Indian financial system will be confirmed to sustain capital inflows. The causality test aimed at determining various interlinkages has been applied to determine the semi-strong form of efficiency of Indian stock market with Sensex as a barometer of Indian financial system. Further, whether massive capital inflows are sustainable or not in the context of macroeconomic variables, will prudence exercised with regard to formulation of macroeconomic and exchange rate policies in the light of huge capital inflows. In order to address these concerns, this section aims at analysing the interlinkages among four domestic variables and two foreign variables. The domestic variables included in the analysis are (I) Sensex as an indicator of Indian stock market, (II) Money Supply (M_3) as an indicator of domestic liquidity or credit expansion (III) Wholesale Price Index (WPI) as an indicator of domestic inflation and (IV) Index for Industrial Production(IIP) as an indicator of economic growth. Index for industrial production (IIP) has been used as proxy for economic growth because the data on Gross Domestic Product (GDP) is not available with the desired frequency (monthly) and (V) Exchange Rate of Indian rupee (ER). From among these variables, Sensex as an indicator of Indian stock market will

reflect Indian financial system and other domestic variables such as M_3, IIP, WPI and ER represent Indian macroeconomic system. Foreign Institutional Investors', (FIIs) investment used in this study is indicator of financial liberalisation of India. If no (uni-directional or bi-directional) causality is found, between Sensex and Net Investment of FIIs, then domestic stock market will be termed as efficient which in turn will confirm that foreign investors do not indulge in momentum or positive feedback trading practices and thus do not destabilise Indian capital market and market will be considered efficient in semi-strong form. Efficiency of stock market will in turn determine whether Indian financial system is capable of sustaining the huge amount of capital inflows or not. The interlinkages of Foreign Institutional Investors (FIIs) Investment alternatively with each of the macroeconomic variable IIP, WPI and M_3 will signify the absorptive capacity of Indian economic system at aggregate level. Keeping this in view the study aims at testing following hypotheses:

1.1 No causality exists between Sensex and FIIs investment.
1.2 No causality exists between economic growth (IIP) and FIIs investment.
1.3 No causality exists between inflation (WPI) and FIIs investment.
1.4 No causality exists between Exchange Rate (ER) and FIIs investment.
1.5 No causality exists between money supply (M_3) and FIIs investment.

II. REVIEW OF LITERATURE

Attempts have been made in earlier studies to analyse the relationship between FIIs investment and stock prices. Most of these studies found that stock prices and FIIs has a significant impact upon each other. (Samal, 1997,[2]) concluded that the main emerging feature of India's equity market since 1991 is its gradual integration with global market and problem faced due to capital movement by FIIs. FIIs are manipulating the equity market and equity price movement is greatly influenced by them. (Pal, 1998, [3]) argued that entry of FIIs will boost country's stock market and economy does not seem to be working in India. Instead, there has been increased uncertainity and skepticism about stock market. (Stiglitz, 2000,[4]) observed that the general consensus with regard to the management of portfolio flows towards developing countries emanates from larger volatility associated with such flows as compared to foreign direct investment (FDI). (Chakrabarti, 2001,[5]) examined that all the existing studies on determinants of portfolio flows to India find co-movement between FII flows and Bombay Stock Exchange Sensex to be fairly high. Contemporaneous domestic stock market was found to be an important determinant for FII inflows. Study also found that in the pre-Asian crisis period, any change in FIIs investment has a positive impact and post Asian crisis period has negative impact on equity returns.

(Gorden and Gupta, 2003,[6]) found that given the huge volume of investment, foreign investors could play a role of market makers and book their profits by purchasing the financial assets when asset prices are falling and selling these financial assets when prices are rising.(Badhani, 2005,[7]), analysing monthly data from April, 1993 to March, 2004 observed that (a) long-run bi-directional causality exists between FIIs investment and stock prices (b) no long-term causality exists between exchange rate and stock prices (c) uni directional long-run causality runs from exhange rate to stock prices. (Bhattacharya and J. Mukherjee, 2005,[8]), determined lead and lag interlink- ages between Indian stock market, net foreign institutional investment and exchange rate. The study concluded that (a) a bi-directional causality exists between stock prices and net foreign institutional investment (b) uni-directional causality runs from exchange rate to stock market returns (c) no causal relationship is detected between exchange rate and net investment by FIIs. From the literature surveyed, it is found that a number of studies analysed the causality between Indian stock prices and FIIs investment. But a very few existing studies focused on interlinkeages of FIIs investment with exchange rate, economic growth, money supply and stock pricesof the host country. Further, it is also observed the existing studies do not account for whether or not the domestic financial and macroeconomic system is independent of the instability caused by FIIs inflows in India. Keeping this gap in view the main focus of the present study is on assessing causal relationship of FIIs investment with stock prices and macro economic variables in India.

III. OBJECTIVES OF STUDY:

Study is undertaken with following objectives:

3.1 *To determine long-run causality relationship of FIIs investment with financial and macroeconomic system.*

3.2 *To determine whether or not FIIs indulge in herding behaviour to destabilise the capital market.*

IV. DATABASE AND METHODOLOGY

To analyse the objectives of study monthly data from May 1993 to March 2013 on foreign institutional investment (FIIs), month end exchange rate of Indian rupee, sensex, Index for Industrial production, money supply (M_3) and wholesale price index has been taken from Reserve Bank of India's publication on hand book of statistics on Indian economy. Toda and Yamamoto (1995,[9]) long-run causality test has been applied to examine the nature of various inter relationships among foreign and domestic variables. This test is an improvement over the traditional Granger (1969, [10]) causality test since the test is valid whether the series are stationary or non stationary and also co-integrated or not co-integrated. Tada and Yamamoto (1995) causality test is based upon augmented Vector Autoregressive (VAR) model and MWALD (Chi-square) statistic which is asymptotically distributed. Augmented VAR model based upon defined foreign and domestic variables is estimated over a period of May 1993 to March 2006. Toda and Yamamoto (1995) causality test has been applied to test semi-strong form hypothesis for Indian capital market and is based upon augmented Vector Autoregressive (VAR) model and MWALD (Chi-square) statistic which is asymptotically distributed.

Augmented VAR model based upon defined foreign and domestic variables is estimated over a period of May 1993 to March 2013. Empirical analysis consists of following three steps:

4.1 Firstly order of integration for each variable under study is determined by applying Augmented Dickey (Dickey and Fuller, 1979, [11]***) unit root test.*** This will determine d_{max} i.e., maximum order of integration. The unit root test checks whether a series is stationary or not. For this the following types of Augmented Dickey Fuller (ADF) regression has been applied:

$$\Delta Y_t = \alpha_1 Y_{t-1} + \sum_{m=1}^{n} \beta_m \Delta Y_{t-m} + \mu_t \quad \text{.....(1)}$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{m=1}^{n} \beta_m \Delta Y_{t-m} + \mu_t \quad \text{.....(2)}$$

Where, μ_t is white noise. The equation (1) is without intercept but equation (2) is with intercept. The additional lagged terms have been included to ensure that errors are uncorrelated. The following hypotheses have been tested by applying unit root tests:

H_o : Y_t is not I (0) i.e., [Y_t is not integrated of order zero].

H_1: Y_t is I (0) i.e., [Y_t is integrated of order zero].

If the calculated ADF statistics are insignificant then the null hypothesis (H_o) is accepted and the series are taken as non-stationary or not integrated of order zero. Hence, unit root exists. Alternatively, if the calculated ADF statistics are significant then the alternate hypothesis (H_1) is accepted and the series are taken as stationary or integrated of order zero. Hence, unit root does not exist.

4.2 Secondly, Optimum lag length for VAR has been determined on the basis of Likelihood ratio (LR) test using following formula:

$$LR = (T-m) \{\log \mid \Omega_{l-1} \mid - \log \mid \Omega_l \mid \} \sim \chi^2 (k^2)$$

Where LR stands for likelihood ratio, m is the number of right hand side parameters per equation, T is number of observations and k represents the number of variables in the system. This LR statistic is then compared to the 5% critical values starting from the maximum lag and decreasing the lag one at a time until the first rejection is obtained. The alterative lag order from the first rejected test will be the optimum lag length under likelihood ratio test.

4.3 Based upon d_{max} + lag length, augmented VAR will be estimated to calculate MWALD (Chi-square) statistics.

Having determined d_{max} from unit root test and lag length by likelihood ratio test, the next step is to conduct causality test by means of an 'augmented' VAR (Vector Autoregressive Test). Co-integration test is not relevant under Toda and Yamamoto causality test (Toda and Yamamota 1995). Under Toda and Yamamoto causality test MWald statistic is calculated which is asymptotically distributed. According to Toda and Yamamoto for $d_{max} = 1$, the lag selection procedure will be valid at least asymptotically if selected lag length (k) is $k \geq 1$. Thus if d = 2, then test will be valid for $k \geq 2$. MWald statistic considered under this test is valid irrespective of the fact that whether a series is I (o), I (1) or I (2) , co-integrated or non co-integrated. The test is further explained with a simple example of bivariate model with lag length (k=1). That is:

$$X_t = \alpha + \alpha_1 x_{t-1} + e_t \quad \text{.....(3)}$$

Further to test that X_2 does not Granger cause X_1, parameter restriction is $\alpha^{(1)}_{12} = 0$. Let us suppose that X_{1t} and X_{2t} are integrated of order one I (1), then a standard t-test is not valid. Following (Dolado and Lutekpohl, 1996,[12])) $\alpha^{(1)}_{12} = 0$ is tested by constructing usual MWald test based on least square estimates in the augmented VAR model as follows:

$$\begin{bmatrix} X_{1t} \\ X_{2t} \end{bmatrix} = \begin{bmatrix} \alpha_{10} \\ \alpha_{20} \end{bmatrix} + \begin{bmatrix} \alpha_{11}^{(1)} \alpha_{12}^{(1)} \\ \alpha_{21}^{(1)} \alpha_{22}^{(1)} \end{bmatrix} \begin{bmatrix} X_{1,t-1} \\ X_{2,t-2} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} \text{..... ....(4)}$$

Where $E(e_t) = \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} = 0 \; E(e_t \dot{e}_t) = \Sigma$

The MWald statistic to be derived from above "Seemingly Unrelated Regression Equations" (SURE) will be asymptotically distributed as a chi-square, with degree of freedom equal to the number of zero restrictions, irrespective of whether X_{1t} and X_{2t} are I (0), I (1) or I (2), co-integrated or non co-integrated.

4.4 Attempt has also been made to analyse whether FIIs indulge in herding. For this purpose aggregate FIIs data on FIIs purchases, sales and net investment have been used. For monthly data the time period is from April 1993 to December 2012. Herding measure as proposed by Lakonishok, Shleifer and Vishny (LSV, 1992,[13]) has been applied to estimate herding activity by FIIs in Indian stock market. The LSV measure is as follows:

$$HM = \left| p_t - E[p_t] \right| - E\left| p_t - E[p_t] \right| \text{.....(5)}$$

Where p_t is the proportion of purchases by FIIs to total trade (sum of purchases and sales) by FIIs at time t while $E\left| p_t - E[p_t] \right|$ is the adjustment factor to consider the random fluctuations in trade and has been subtracted from the first term to correct for mean value of the first term under the assumption of no herding. Further adjustment factor has been computed on the basis of the assumption that p_t follows a binomial distribution with $E[p_t]$ being probability of success which in turn has been proxied average 'buy' trade during the whole period of study. The extent of herd behaviour is given by the average of Herding Measure (HM) over the entire period of study. A positive and significant HM will imply that FIIs indulged in herding and vice-a-versa. Keeping in view the limitation of LSV measure[1] as highlighted by Batra, 2003, [14] which uses only number of investors, trade imbalance rather than number of FIIs trading on either side of the market has been considered. This measure can be modified to calculate Buy Herd Measure (BHM) and Sell Herd Measure (SHM) separately as follows:

$$BHM(t) = HM(t) \; \left| p(t) > E[p_t] \right.$$
$$SHM(t) = HM(t) \; \left| p(t) < E[p_t] \right.$$

If the herding measure turns out to be significant, then it will imply that FIIs indulge in herding practices and mimic each other's trading behaviour. To estimate the herding measure besides monthly data from April 1993 to December 2012, daily data from January 1999 to December 2012 has also been considered.

V. EMPIRICAL ANALYSIS

The results of unit root test for the first and second differences are presented in Table I and II.

Table I: Augmented Dickey-Fuller Unit Root Test at Levels for Sensex, IIP, WPI, M_3, FII and ER

Series	At levels		First Differences	
	ADF Value	P-Value	ADF Value	P-Value
Sensex	0.64	0.99	-9.19*	0.00
IIP	1.47	0.99	-2.70*	0.007
WPI	0.26	0.97	-10.6*	0.00
M_3	7.30	1.00	0.83	0.99
FII	0.71	0.99	-3.85*	0.003
ER	-1.40	0.33	-11.90*	0.00

*significant at 1% level.

Table II: Augmented Dickey-Fuller Unit Root Test (Second Differences) for M_3

Series	Second Differences	
	ADF Value	P-Value
M_3	-9.06*	0.00

*significant at 1% level.

Table I shows that all the six variables are non-stationary at levels as ADF-values are insignificant. Further, all the variables, except, M_3 become stationary when their first differences are considered (first difference ADF values are significant for each variable). But when the second differences of M_3 series are considered it also becomes stationary as is exhibited in Table II. Thus all the series are integrated of order I (1) except M_3 which is integrated of order I (2). Hence, maximum order of integration (d_{max}) is 2. The optimum lag length of two (k=2) has been determined on the basis of Likelihood Ratio (LR) test for augmented Vector Autoregressive model (VAR).

Co-integration has not been checked as Toda and Yamamoto, causality test is valid irrespective of the fact whether the series are cointegrated or not. Having determined maximum order of integration of two (d_{max} = 2) and optimum lag length, (k=2), augmented VAR model is estimated by using 'Seemingly Unrelated Regression Equations' (SURE). Four 'Seemingly Unrelated Regression Equations' (SURE), representing the group of selected variables, has been estimated. Equation 6 represents impact of financial liberalisation in the form of capital inflows on financial system, that is, Sensex (SS) as an indicator of stock market. Similarly equations 7, 8, 9 and 10 determine the impact of capital inflows (FIIs investment) on macroeconomic variables viz., Exchange Rate of Indian rupee (ER), Index for industrial production (IIP), inflation represented by wholesale price index (WPI) and domestic money supply (M_3) respectively.

The system of equations, jointly estimated as a 'Seemingly Unrelated Regression Equations' (SURE) to calculate MWALD statistic is as follows:

$$\begin{bmatrix} SS_t \\ FII_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} SS_{t-1} \\ FII_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} SS_{t-2} \\ FII_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} SS_{t-3} \\ FII_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} e_{ss} \\ e_{fii} \end{bmatrix} \quad \ldots\ldots\ldots \quad (6)$$

$$\begin{bmatrix} ER_t \\ FII_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} ER_{t-1} \\ FII_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} ER_{t-2} \\ FII_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} ER_{t-3} \\ FII_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} e_{er} \\ e_{fii} \end{bmatrix} \quad \ldots\ldots\ldots \quad (7)$$

$$\begin{bmatrix} IIP_t \\ FII_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} IIP_{t-1} \\ FII_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} IIP_{t-2} \\ FII_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} IIP_{t-3} \\ FII_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} e_{iip} \\ e_{fii} \end{bmatrix} \quad \ldots\ldots\ldots \quad (8)$$

$$\begin{bmatrix} WPI_t \\ FII_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} WPI_{t-1} \\ FII_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} WPI_{t-2} \\ FII_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} WPI_{t-3} \\ FII_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} e_{wpi} \\ e_{fii} \end{bmatrix} \quad \ldots\ldots\ldots \quad (9)$$

$$\begin{bmatrix} M_{3t} \\ FII_t \end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix} M_{3t-1} \\ FII_{t-1} \end{bmatrix} + \alpha_2 \begin{bmatrix} M_{3t-2} \\ FII_{t-2} \end{bmatrix} + \alpha_3 \begin{bmatrix} M_{3t-3} \\ FII_{t-3} \end{bmatrix} + \alpha_4 \begin{bmatrix} e_{m_3} \\ e_{fii} \end{bmatrix} \quad \ldots\ldots\ldots \quad (10)$$

The results of MWALD test statistic with corresponding p-values are presented in Table III.

Table III: Results of Long-Run (Toda and Yamamoto, 1995) Causality Test for Sensex, IIP, WPI, M_3, FII and ER

Null Hypothesis	MWALD Statistics	P-value
I Sensex Versus FII		
a) SS does not Granger Cause FII	12.51*	0.00
b) FII does not Granger Cause SS	5.28***	0.07
II Exchange Rate Versus FII		
a) ER does not Granger cause FII	1.61	0.44
b) FII does not Granger cause ER	0.44	0.80
III IIP versus FII		
a) FII does not Granger cause IIP	10.29*	0.00
b) IIP does not Granger cause FII	5.67***	0.05

IV WPI versus FII		
a) FII does not Granger cause WPI	1.93	0.38
b) WPI does not Granger cause FII	6.75**	0.04
V M3 versus FII		
a) M3does not Granger cause FII	8.14**	0.04
b) FII does not Granger cause M3	10.86*	0.00

*significant at 1% level.
**significant 5% level.
***significant at 10% level of significance.

Following interlinkages have been confirmed from the results of Long-run causality test (Toda and Yamamoto, 1995):

5.1 A bi-directional causality exists between stock prices (Sensex) and net investment by Foreign Institutional Investors (FIIs).

Hence, semi-strong form of stock market efficiency hypothesis is rejected for stock prices (Sensex) with respect to FIIs investment. It implies that Indian stock market (financial system) is inefficient in its semi-strong form. Thus, foreign institutional investors indulge in positive feedback or momentum trading since bi-directional causality has been detected. Positive feedback trading strategies at the instance of FIIs imply that FIIs invest in Indian stock market when stock prices are rising. On the one side positive feedback practices cause Indian stock market prices to rise further and thus push the prices away from their fundamental value. Also at the same time it gives another signal that FIIs will withdraw as soon as stock prices begin to fall and in that process will destabilise the stock market. This bi-directional causal relationship holds firstly because, FIIs invest in emerging equity markets only if they foresee higher returns in these emerging markets than equity markets of their home countries (which are developed countries) as well as other developed countries and withdraw their investments as soon as they do not foresee any such higher returns in near future. Secondly, stock market index e.g. BSE Sensex and return on stock market index have direct positive relationship. If BSE Sensex jumps up, returns on BSE Sensex will also increase and vice-a-versa.

5.2 No causality is detected between FIIs investment and exchange rate. It implies that both FIIs investment and exchange rate can capture information with respect to each other. Absence of causality from exchange rate to FIIs investment indicates that FIIs have prior information on behaviour of exchange rate of rupee. This further enhances the scope for profit booking tendency of FIIs. Thus, scope of speculative transactions by FIIs further increases.

5.3 Bi-directional causality exists between FIIs investment and Index for industrial production (IIP.) It implies that FIIs has an impact upon economic growth of domestic country (India) and in turn inflows of FIIs are lured by attractive economic growth of India. Thus, even the real sector is not insulated from the hot money character of FIIs inflows.

5.4 Causality runs from inflation (WPI) to foreign investment (FIIs). It signifies that domestic inflation has an impact upon the FIIs investment.

5.5 A bi-directional causality exists between money supply (M_3) and FIIs investment.. It implies that capital inflows in the form of FIIs investment have an impact upon domestic money supply. Thus, foreign investment eventually may lead to problem of inflation via increase in availability of money supply (M_3) and deflation via decline in domestic money supply.

It is clear from the long-run causality discussed above that Indian financial system is not mature enough to absorb the massive capital inflows since positive feedback trading hypothesis has been confirmed which implies availability of profitable trading opportunities to FIIs due to inefficiency of Indian stock market. Also, interlinkages of FIIs investment with macroeconomic variables (IIP, WPI, ER and M_3) have far reaching economic implications. Foreign investment (FIIs) has an impact upon macroeconomic system of India as indicated by causality from FIIs investment to Index for Industrial Production (IIP), M_3 i.e., money supply and Exchange rate of Rupee (ER). This explains how Foreign Institutional Investors make the Indian economy vulnerable to foreign capital inflows. Capital inflows may result in expansionary impact on domestic credit and thus may eventually fuel up the inflation level. Further, FIIs investment contributes to economic growth. Similarly domestic economic variables are found to have an impact upon FIIs investment as indicated by causality from index for industrial production, money supply (M_3), domestic inflation (WPI) to FIIs investment. Hence, all the three domestic economic variables are determinants of FIIs investment. Thus, Indian macroeconomic system has also been observed as bearing the heat of FIIs activities.

The results of herding measure have been presented in Table IV.

Table IV: Herding Measure for FIIs Investment (%)

Sample	LSV Herding Measure	Modified Herding Measure	
		BHM	SHM
Daily (Jan., 1999 to Dec., 2012)	0.003	0.003	0.003
Monthly (April 1993 to Dec., 2012)	10**	14**	6**
Monthly (July1997 to Dec., 1998)	11**	10**	11**

**significant at 5% level of significance.

Table reveals that herding has been observed to exist significantly in Indian stock market in monthly data but no significant herding could be traced in daily data. Herding by FIIs on monthly basis has been found to be 10% which implies that the actual accumulation of FIIs in one direction i.e., selling together or buying together is 10% higher than that expected under the circumstances if FIIs were acting independently. Thus, FIIs follow the trading pattern of the investors in their group over a month's horizon but not on daily basis. Further, buy herd 14% has remained higher than sell herd 6% for the whole period of the study i.e., from April 1993 to December 2012. But, this tendency of FIIs trade got reversed when a sub-period consisting of East Asian crisis i.e., from July 1997 to December 1998 is considered. The time period of East Asian crisis exhibited higher sell side herding (11%) relative to buy side herding (10%). It further signifies that during the times of adversity (East Asian Crisis) sell herd was more pronounced in comparison to buy herd but for the entire period consisting of April 1993 to December 2012 buy herd has remained higher than sell herd. Hence, it is clear from the table that during the period of adversity, the chances of instability are higher since it is the sell herd which will set downturn in terms of spiral of lower returns on Indian equity and may eventually end up in financial crisis.

VI. CONCLUSION

The results of long-run causality test based on monthly data imply that Indian financial system is inefficient since a bi-directional causality exists between stock prices (Sensex) and net investment of Foreign Institutional Investors (FIIs). It implies that foreign institutional investors indulge in 'momentum' or 'positive feedback' trading hypothesis. Absence of causality from exchange rate to FIIs investment indicates that FIIs have prior information on behaviour of exchange rate of rupee which further signals the problem of profit booking tendency of FIIs and enhances the scope of speculative transactions by FIIs. Thus, Indian financial system is not mature enough to absorb the massive capital inflows as indicated by availability of profitable trading opportunities to FIIs due to inefficiency of Indian stock market. Further, interlinkages of foreign variables FIIs investment with domestic macroeconomic variables (IIP, WPI, ER and M_3) have far reaching economic consequences which imply that Indian macroeconomic system is bearing the heat of FIIs activities. Foreign investment of FIIs has an impact upon domestic money supply (M_3). Capital inflows may result in expansionary impact for domestic credit and thus may eventually fuel-up inflation. From the point of view of economic growth, foreign investment inflows by FIIs have an impact upon economic growth (IIP) and vice-a-versa. It implies that FIIs investment contributes to economic growth and also at the same time economic growth of the recipient economy is a determinant of FIIs investment. It highlights that in order to sustain heavy capital inflows either the economic policies to strengthen the absorptive capacity of India should be stressed upon or liberalisation of capital inflows should be restricted. Absorptive capacity aims at enhancing stock market efficiency (financial system) through more transparency with regard to perfect availability of public information both past and current. Similarly, in order to build up the absorptive capacity of economic system, domestic economic variables such as index for industrial production, domestic money supply should be healthy enough to sustain FIIs investment. These interlinkages of FIIs investment with domestic financial and economic system throw a light upon the volatile character of FIIs investment. Hence, on the basis of interactions of FIIs investment with financial system and economic system, it can be concluded that FIIs investment is highly volatile by nature. Furthermore, LSV herding measure exhibited that herding at the instance of FIIs prevails significantly in Indian stock market in monthly data but no significant herding could be traced in daily data. Herding by FIIs on monthly basis has been found to be 10% which implies that the actual accumulation of FIIs in one direction i.e., selling together or buying together is 10% higher than that expected under the circumstances if FIIs were acting independently. However, when herding has been tested for the sub-period of East Asian crisis, sell herd became more pronounced in comparison to buy herd but for the entire period consisting of April 1993 to December 2012 buying herd has remained higher than sell herd. Thus, during the period of adversity, the chances of instability are higher since it is the sell herd which will set downturn in terms of spiral of lower returns on Indian equity and may eventually end up in financial crisis.

All these evidences regarding momentum also called as positive feedback hypothesis and herding imply that FIIs cause instability in Indian stock market. It is happening just due to the fact that Indian stock market has remained inefficient to check the manipulative activities of the FIIs. This clearly implies that India is lacking the desired degree of absorptive capacity in terms of its economic and financial system to sustain capital inflows.

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