Mutual Fund & Foreign Institutional Investors : Pre & Post Crisis Dynamics

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Abstract

Institutional investors are smart traders and their informational advantage about firm values may propel them to play a significant role in price discovery. The trust of the market on institutional trade may also induce herding leading to faster price correction or even deviation due to overreaction. Foreign institutional investors (FII) may often score over domestic mutual funds (MF) in efficient trading decisions due to perceived superiority in analytical skills and investment experience. Researchers contradicting such views cited familiarity of the local environment and absence of linguistic or cultural barriers for domestic mutual funds as the reason of their superiority in security valuation, market timing, and trade decision. This paper was an attempt to find an answer to a controversial question about who is better informed about firm values, FIIs or the domestic mutual funds.

Keywords : **foreign institutional investors, herding, information asymmetry, mutual fund, vector autoregression**

JEL Classification : G140, G230, C580

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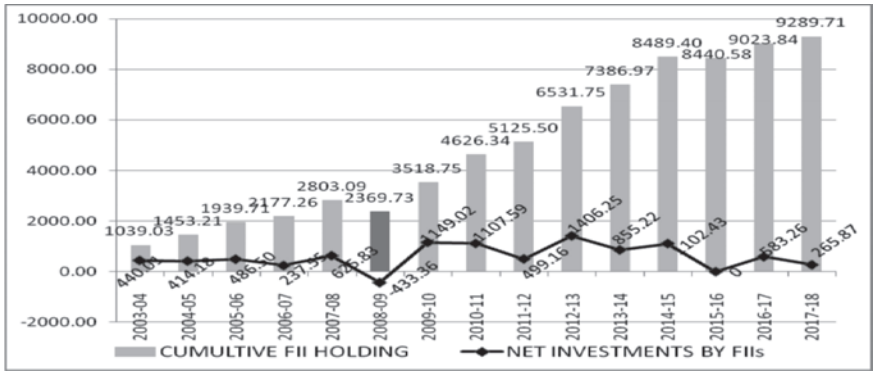
India has been considered trans-border investors' green pasture for almost two decades due to robust economic growth and liberal policies. Especially after single window policy for foreign institutional investors adopted by the Indian government in 2003, net foreign portfolio investment (FPI) flows sharply increased to reach ₹ 625.83 billion and cumulative holdings of ₹ 2803.09 billion (Figure 1) by the year 2007-08.

Figure 1. Net FII Investment and Cumulative FII Holding



Source: Compiled from Reserve Bank of India (2018). *Handbook of statistics on Indian economy (2017-18)*. Retrieved from https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/0HSIE_F.PDF

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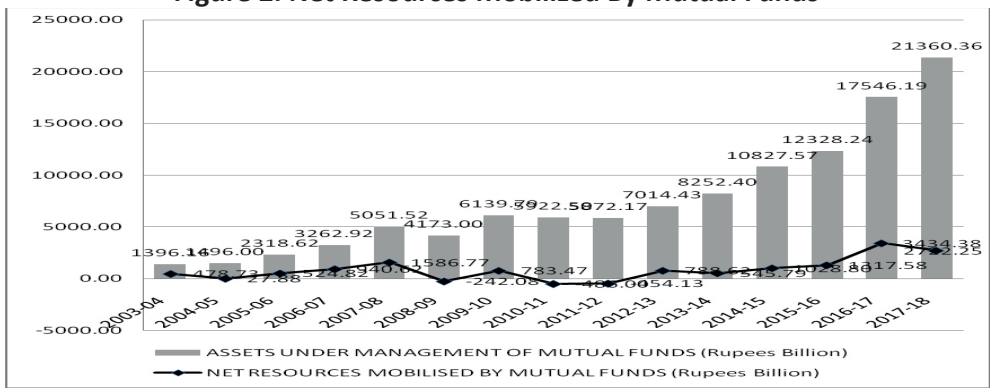
Figure 2. Net Resources Mobilized By Mutual Funds



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During the global financial crisis stemmed by sub-prime crisis in the U.S. and the following contagion, FPI in India plummeted to a net outflow of ₹ 433.36 billion (cumulative FII investments fell by 15% YoY) during 2008 - 09. Rise in risk and large fall in valuations in the USA triggered the outflow from emerging economies including India. A fear of contagion and the resultant search for safety of funds indeed added momentum to the contagion. In the aftermath of the crisis, FPI flows again bounced back to ₹ 1149.02 billion during 2009-10.

Indian mutual funds also witnessed a negative net resource mobilization, a fall of 15.25% YoY and around 5% of total assets under management (Figure 2) during 2008-09 as investor confidence was shaken on account of significant fall in industrial production, reducing corporate profit margins, falling valuations, increasing return volatility, and unprecedented FPI outflows. Net resource mobilization bounced back the following year to the extent of 18.7% of total assets under management of the previous year end.

Empirical studies on both developed and emerging markets have found both mutual funds and foreign portfolio investors as smart traders possessing distinct informational advantages as against individual traders. Large trade volume guided by superior analytical expertise and larger resource base of institutional investors synchronize to render economies of scale and thus, reduce the marginal costs of information acquisition and processing. Superior information driven trade decisions of institutional investors impart momentum to the process of price discovery. In an inefficient market, stock returns reflect mispricing, slow price correction, and exploitable irregularities. The institutional investors, banking on their informational advantages, may exploit the opportunities to reap abnormal profits. With a rise in the number of competing institutional investors, the market may exhibit faster price correction to reflect new information and reduced mispricing, with gradual evaporation of exploitable irregularities.

In financial literature, there is a growing discussion about information asymmetry between domestic and foreign investors. Among institutional investors, foreign ownership is found to have strong association with R & D expenditures of the firm and firm performance. Stocks with high foreign ownership tend to outperform stocks with low foreign ownership as they enjoy a long term information advantage (Huang & Shiu, 2009). A study on fund managers of developed economies observed domestic and foreign fund managers' differential investment behavior (Covrig, Lau, & Ng, 2006), which may be attributed to difference in quality and quantity of information acquired and expertise in information processing. Higher credibility and reputation of foreign institutional investors may induce domestic investors, including mutual funds to follow actions of FIIs which may be more profound in emerging economies like India. Behavioural changes in FPI flows and mutual fund investments were witnessed after the crisis of 2007-08, such as, FPIs becoming more sensitive to interest rate differentials between source country and host country and risk aversion being placed by mutual funds ahead of

risk management. The change in the dynamic relationship between FPI and domestic mutual fund behaviour after the global financial crisis has become a subject of serious study.

Literature Review

Dennis and Weston (2001) documented strong evidence that U.S. equity markets institutions were better informed, which is consistent with the hypothesis that there exist economies of scale in acquisition and aggregation of information, which may put FIIs in more advantageous position than domestic mutual funds. They also found that firms with a higher percentage of institutional ownership portrayed higher incidence of informed trading. By analyzing the joint behaviour of returns, cash - flow news, and trading between individuals and institutions, Cohen, Gompers, and Vuolteenaho (2002) found that institutions responded to good cash flow news by buying shares from individuals. Thus, institutions as a group exploit the underreaction in price response to firm level cash-flow news and move prices to their fundamental values.

Institutions are momentum investors, tend to follow past price changes, and engage in herding (Grinblatt, Titman, & Wermers, 1995). Herding by institutional investors accelerates incorporation of new information into stock prices and thus, moves stock prices towards their fundamental values (Nofsinger & Sias, 1999; Wermers, 1999), showing evidence that institutional demand is weakly, but positively related to returns over the following year. Sias (2004) suggested that institutional herding reflected the manner in which information was incorporated into securities prices. However, working on Indian stock markets, De and Chakraborty (2018) observed that stocks with higher foreign institutional holdings did not lead to significantly better informative prices.

When there is uncertainty about the quality of traders' information, herd behaviour may cause significant short run mispricing (Avery & Zemsky, 1998). Puckett and Yan (2008) showed that short term institutional herding significantly affected efficiency of security prices. They found strong evidence of return reversals following short-term sell herds and weak evidence of return continuations following short-term buy herds. The short term sell herds were motivated by behavioural considerations and drove prices away from fundamental values. From the evidence of absence of return reversals following short-term buy-herds, the authors suggested that these herds were information based and helped incorporation of new information into security prices.

Relative superiority of information content of trade decisions by foreign and domestic institutional investors is a controversial question. Although familiarity of the local environment and absence of linguistic or cultural barriers are likely to give local investors a superior understanding about local firm fundamentals (Brennan & Cao, 1997 ; Dvořák, 2005; Hau, 2001), evidences were found by researchers that foreign investors were generally sophisticated institutional investors possessing superior analytical skills and investment experience which enabled them to analyze market conditions and firms' fundamentals better, leading to optimal investment and trading decisions and a superior performance than the local investors (Froot & Ramadorai, 2008; Grinblatt & Keloharju, 2000; Karolyi, 2002). In emerging markets, where the local investors are likely to be less sophisticated, the effect may be more intense.

Froot, O'Connell, and Seasholes (2001) analyzed daily net portfolio flows into 44 countries between 1994 and 1998. They provided evidence that portfolio flows in and out of an economy had positive and statistically significant forecasting power for future equity returns in emerging markets. Therefore, institutional cross-border flows were linked to fundamentals (Froot & Ramadorai, 2008). Working on the Taiwanese stock market, Huang and Shiu (2009) showed that foreign investors enjoyed an informational advantage over local investors in the long run. Ding, Guedhami, Ni, and Pittman (2012) found evidence that in state owned enterprises, local institutional ownership had strong forecasting power for future stock returns, but foreign institutional ownership had no such predictive ability ; whereas, in non-state owned enterprises, foreign institutional ownership was positively and significantly related with future stock returns, the relationship being weak for local institutional ownership, suggesting that trade decisions of FIIs in non-state owned firms were driven by superior information, but they did not enjoy this advantage in case of state owned firms.

Objective and Methodology

The study attempts to put some light on the inconclusiveness about the causal relationship between foreign institutional investors (FIIs) and mutual fund holdings in equity shares and their relative ability in leading stock returns in the Indian context.

(1) Sample Selection : Fifty (50) companies included in Standard & Poor (S&P) CNX Nifty constituted the universe of the study. The Nifty companies are the focus of this study for two reasons. First, they have widely dispersed shareholding in comparison to small cap companies and hence, are expected to disclose more information. Second, these companies' market capitalization constituted around 62.9% of the market capitalization of all NSE listed companies (as on March 31, 2017).

(2) Period of Study : The period from 2004-05 to 2017-18 were selected for the purpose of the entire study. Subjecting the retrieved time-series data of each firm to Chow breakpoint test found a structural break during 2003-04, which indicates the prudence of studying the period since then. This is further strengthened by the fact that in 2003, with the objective of streamlining the registration process of FIIs and reducing the time taken for registration, the dual approval process of Securities and Exchange Board of India (SEBI) and Reserve Bank of India (RBI) was changed into a single approval process of SEBI leading to a sudden surge in annual net addition to the number of FIIs and the net investment by them.

(3) Data Type and Source : The analysis is based on secondary data at firm level. The CMIE Prowess database was the source of information about the mutual fund activities, foreign institutional investors' activities, and firm level quarterly financial data.

(4) Statistical Tools : Vector auto regression (VAR) method is used to explain the interrelationship of the variables. VAR Granger causality or Wald tests are employed to find the existence of causality and the direction thereof. Statistical calculations are done making extensive use of Microsoft Excel and panel data analysis is done using EVIEWS software package.

(5) Hypotheses : To determine the relationship between FII holdings and mutual fund holdings in a firm's stock, the following null hypotheses are framed and tested :

+ **Hypothesis 1 (H_{01}) :** An increase (decrease) in FII holding in a firm does not result in an increase (decrease) in mutual fund holding.

+ **Hypothesis 2 (H_{02}) :** An increase (decrease) in mutual fund holding in a firm does not result in an increase (decrease) in FII holding.

+ **Hypothesis 3 (H_{03}) :** An increase (decrease) in FII holding in a firm does not precede an increase (decrease) in return on the firm's stock.

+ **Hypothesis 4 (H_{04}) :** An increase (decrease) in mutual fund holding in a firm does not precede an increase (decrease) in return on the firm's stock.

(6) Variables Used :-

+ **Foreign Institutional Holding ($FII_{i,t}$) :** Contemporaneous and lagged values of FII holdings are used for the purpose of vector autoregression. FII holdings for any firm include all shares held by non-residents irrespective of

their location. Firm level FII holding is measured by the percentage of outstanding common shares held by the FIIs in each company at the end of quarter *t*.

✦ **Mutual Fund Holding ($MF_{i,t}$) :** Firm level mutual fund holding is measured by the percentage of outstanding common shares held by the mutual funds (MF) in each company at the end of the quarter *t*.

✦ **Return ($RET_{i,t}$) :** Researchers have observed significant relation between institutional investments and stock returns (Bohn & Tesar, 1996 ; Clark & Berko, 1997; Dornbusch & Park, 1995). It is measured by quarterly percentage stock return as available in the CMIE Prowess database.

✦ **Liquidity ($TO_{i,t}$) :** Natural logarithm of quarterly turnover of the firms' equity shares are taken as the proxy for liquidity.

✦ **Volatility ($VOLAT_{i,t}$) :** High levels of return volatility induce portfolio rebalancing requirements and trading activity leading to increase in stock liquidity which is necessary for faster incorporation of new information into security prices. Also, FIIs and mutual funds may prefer more stable returns and hence, tend to avoid stocks with high return volatility. Volatility ($VOLAT_{i,t}$) is measured by variance of daily total returns for each stock '*i*' in each quarter '*t*' .

✦ **Size ($MCAP_{i,t}$) :** Small firms usually have undiversified portfolio of assets and projects are riskier than larger firms (Kothari, Li, & Short, 2009). Espinosa and Fructuoso (2003) argued that level of information flow was typically higher for larger firms making them less risky in terms of information asymmetry. Here, the variable $SIZE_{i,t}$ is measured as natural logarithm of each firm's total market capitalization at the end of the quarter *t*.

✦ **Price to Book Value Ratio ($PB_{i,t}$) :** The price to book value ratio is measured by the market value of equity divided by the book value of equity as at the end of each quarter '*t*' of the study period. It is generally considered as one of the factors for investment decision making by institutional investors.

✦ **Promoters' Holdings ($PROM_{i,t}$) :** Higher promoter's holdings in firms causes lower dispersion in ownership and inadequate information flow to the stock market investors, thereby impeding efficient price discovery. Hence, promoter's holding is included in the VAR analysis as another explanatory variable. Promoter's holding ($PROM_{i,t}$) is measured by percentage of outstanding common shares held by the promoters of each company '*i*' at the end of the quarter *t*.

$$MF = \alpha + \sum_{j=1}^{k} \beta_j FII_{i,t-j} + \sum_{j=1}^{k} \gamma_j MCAP_{i,t-j} + \sum_{j=1}^{k} \delta_j MF_{i,t-j} + \sum_{j=1}^{k} \theta_j D\,(PB)_{i,t-j} + \sum_{j=1}^{k} \mu_j PROM_{i,t-j} + \sum_{j=1}^{k}$$

$$\pi_j RET_{i,t-j} + \sum_{j=1}^{k} \rho_j TO_{i,t-j} + \sum_{j=1}^{k} s_j VOLAT + \varepsilon_{i,t} \qquad \text{..... (1)}$$

$$FII_{it} = \alpha' + \sum_{j=1}^{k} \beta'_j FII_{i,t-j} + \sum_{j=1}^{k} \gamma'_j MCAP_{i,t-j} + \sum_{j=1}^{k} \delta'_j MF_{i,t-j} + \sum_{j=1}^{k} \theta'_j D\,(PB)_{i,t-j} + \sum_{j=1}^{k} \mu'_j PROM_{i,t-j} + \sum_{j=1}^{k}$$

$$\pi'_j RET_{i,t-j} + \sum_{j=1}^{k} \rho'_j\, TO \quad + \sum_{j=1}^{k} s'_j VOLAT + \varepsilon'_{i,t} \qquad \text{..... (2)}$$

(7) The Model : The vector autoregressive (VAR) models contain *'j'* lag values of all the variables included (where $j = 1,\ldots, k$) of each company '*i* ' and for the quarter *'t'*. As price to book value ratio ($PB_{i,t}$) is found to be non-stationary at level, we have used first difference of the series, that is, $D(PB)_{i,t}$ in the equations.

Analysis and Results

On the basis of minimum Schwarz information criterion, lag 2 is chosen as the optimum lag (refer Table 1 for VAR analysis).

The Table 2 and Table 3 reveal that in the pre - crisis period, that is, till 2007, no significant effect of FII flows on mutual fund flows ($\chi^2 = 3.450345$, $p = 0.1781$) and vice versa ($\chi^2 = 2.185852$, $p = 0.3352$) is visible, that is, H_{01} and H_{02} are accepted for the pre-crisis period under study. FIIs are found to follow returns ($\chi^2 = 9.801855$,

Table 1. Schwarz Information Criterion for Various Lags

Lag	0	1	2	3	4	5	6	7	8
SC	40.806	26.035	25.873*	25.953	26.080	26.229	26.346	26.470	26.592

Note. * indicates lag order selected by the criterion.

Table 2. Vector Autoregression Estimates

	Pre Crisis (2004-05 to 2007-08)					Post Crisis (2008-09 to 2017-18)				
	FII	***MF***	***PROM***	***RET***	***VOLAT***	***FII***	***MF***	***PROM***	***RET***	***VOLAT***
FII (-1)	1.009	-0.012	-0.008	0.069	0.236	0.953	-0.044	-0.081	0.056	-0.004
	-0.041	-0.020	-0.042	-0.048	-0.095	-0.027	-0.012	-0.024	-0.025	-0.037
	[24.495]	[-0.599]	[-0.187]	[1.427]	[2.482]	[35.936]	[-3.722]	[-3.393]	[2.224]	[-0.105]
FII (-2)	-0.056	0.021	-0.010	-0.060	-0.244	0.030	0.043	0.069	-0.060	0.008
	-0.041	-0.020	-0.042	-0.048	-0.095	-0.027	-0.012	-0.024	-0.025	-0.037
	[-1.347]	[1.050]	[-0.249]	[-1.239]	[-2.569]	[1.115]	[3.689]	[2.879]	[-2.395]	[0.214]
MF (-1)	-0.059	1.026	-0.006	0.057	0.026	-0.131	1.015	-0.049	0.020	-0.151
	-0.081	-0.040	-0.083	-0.096	-0.188	-0.056	-0.025	-0.050	-0.053	-0.079
	[-0.724]	[25.826]	[-0.076]	[0.597]	[0.136]	[-2.330]	[40.784]	[-0.974]	[0.372]	[-1.907]
MF (-2)	0.086	-0.092	0.024	-0.103	-0.155	0.140	-0.058	0.075	-0.030	0.067
	-0.080	-0.039	-0.082	-0.094	-0.185	-0.056	-0.025	-0.050	-0.053	-0.079
	[1.077]	[-2.345]	[0.297]	[-1.093]	[-0.835]	[2.485]	[-2.335]	[1.485]	[-0.565]	[0.849]
PROM (-1)	-0.005	0.009	0.967	0.010	-0.145	-0.140	-0.020	0.913	0.009	0.033
	-0.046	-0.022	-0.046	-0.054	-0.105	-0.029	-0.013	-0.026	-0.027	-0.041
	[-0.114]	[0.383]	[20.85]	[0.195]	[-1.378]	[-4.859]	[-1.530]	[35.325]	[0.343]	[0.809]
PROM (-2)	0.001	-0.007	0.013	-0.023	0.170	0.135	0.011	0.071	-0.011	-0.029
	-0.045	-0.022	-0.046	-0.053	-0.104	-0.029	-0.013	-0.026	-0.027	-0.040
	[0.016]	[-0.331]	[0.292]	[-0.430]	[1.628]	[4.734]	[0.891]	[2.757]	[-0.427]	[-0.712]
RET (-1)	0.048	0.021	-0.006	-0.007	0.046	0.041	-0.003	0.033	-0.038	0.180
	-0.033	-0.016	-0.034	-0.039	-0.076	-0.027	-0.012	-0.024	-0.026	-0.038
	[1.458]	[1.292]	[-0.169]	[-0.171]	[0.598]	[1.523]	[-0.219]	[1.359]	[-1.466]	[4.708]
RET (-2)	-0.089	0.043	-0.048	0.014	-0.004	0.057	-0.007	-0.011	-0.050	0.082

	-0.031	-0.015	-0.032	-0.037	-0.073	-0.026	-0.012	-0.024	-0.025	-0.037
	[-2.841]	[2.768]	[-1.489]	[0.368]	[-0.060]	[2.141]	[-0.600]	[-0.451]	[-2.019]	[2.195]
VOLAT (-1)	-0.008	0.008	-0.007	-0.002	0.207	0.011	0.021	0.017	0.024	0.250
	-0.017	-0.008	-0.017	-0.020	-0.038	-0.017	-0.007	-0.015	-0.016	-0.024
	[-0.462]	[0.965]	[-0.426]	[-0.121]	[5.401]	[0.646]	[2.793]	[1.111]	[1.544]	[10.61]
VOLAT (-2)	-0.003	-0.007	0.018	0.001	0.065	0.012	-0.001	-0.007	-0.072	0.282
	-0.013	-0.006	-0.013	-0.015	-0.030	-0.012	-0.005	-0.011	-0.011	-0.017
	[-0.199]	[-1.021]	[1.346]	[0.096]	[2.170]	[1.010]	[-0.196]	[-0.617]	[-6.489]	[16.899]
TO (-1)	-0.011	-0.004	-0.050	0.089	0.449	0.094	-0.025	-0.092	0.008	0.183
	-0.081	-0.039	-0.082	-0.095	-0.186	-0.066	-0.029	-0.059	-0.062	-0.092
	[-0.136]	[-0.114]	[-0.608]	[0.935]	[2.412]	[1.439]	[-0.849]	[-1.558]	[0.129]	[1.988]
TO (-2)	0.271	-0.015	-0.047	-0.082	-0.222	0.051	-0.094	0.021	-0.077	0.031
	-0.076	-0.037	-0.078	-0.090	-0.176	-0.062	-0.027	-0.056	-0.058	-0.087
	[3.557]	[-0.396]	[-0.600]	[-0.909]	[-1.261]	[0.827]	[-3.416]	[0.385]	[-1.309]	[0.355]
MCAP (-1)	1.060	0.224	-0.547	1.053	1.215	0.717	-0.101	-0.529	0.575	-3.577
	-0.495	-0.242	-0.504	-0.582	-1.142	-0.308	-0.136	-0.277	-0.290	-0.434
	[2.143]	[0.926]	[-1.084]	[1.809]	[1.064]	[2.325]	[-0.741]	[-1.912]	[1.982]	[-8.239]
MCAP (-2)	-1.415	-0.284	0.810	-1.030	-2.327	-0.940	0.204	0.667	-0.591	2.868
	-0.492	-0.240	-0.501	-0.579	-1.136	-0.309	-0.137	-0.277	-0.291	-0.435
	[-2.874]	[-1.180]	[1.616]	[-1.778]	[-2.049]	[-3.047]	[1.492]	[2.408]	[-2.033]	[6.597]
D(*PB* (-1))	-0.031	-0.035	-0.044	0.118	0.112	-0.070	-0.021	0.148	0.000	0.011
	-0.074	-0.036	-0.076	-0.087	-0.171	-0.028	-0.012	-0.025	-0.026	-0.039
	[-0.420]	[-0.968]	[-0.575]	[1.351]	[0.655]	[-2.516]	[-1.671]	[5.890]	[-0.018]	[0.279]
D(*PB* (-2))	0.022	-0.033	-0.050	0.107	0.560	0.007	-0.005	0.040	0.013	-0.103
	-0.060	-0.029	-0.061	-0.070	-0.138	-0.026	-0.012	-0.024	-0.025	-0.037
	[0.366]	[-1.123]	[-0.829]	[1.525]	[4.061]	[0.261]	[-0.465]	[1.705]	[0.541]	[-2.775]
C	3.979	0.734	-1.510	0.863	15.209	2.630	0.052	-0.602	1.685	9.661
	-0.926	-0.452	-0.944	-1.089	-2.137	-0.886	-0.392	-0.796	-0.835	-1.248
	[4.296]	[1.621]	[-1.600]	[0.791]	[7.115]	[2.967]	[0.131]	[-0.756]	[2.019]	[7.738]
R - squared	0.956	0.921	0.988	0.046	0.279	0.979	0.941	0.992	0.042	0.486
Adj. *R* - squared	0.955	0.919	0.988	0.023	0.262	0.979	0.940	0.992	0.032	0.481

Table 3. Granger Causality Test Results in VAR Framework

Dependent Variable : *FII*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi-square**	***df***	***p***	**Chi-square**	***df***	***p***
MF	2.185852	2	0.3352	6.196009	2	0.0451
PROM	0.527328	2	0.7682	23.83123	2	0
RET	9.801855	2	0.0074	6.890956	2	0.0319
VOLAT	0.320323	2	0.852	2.774323	2	0.2498
TO	21.3593	2	0	4.938568	2	0.0846
MCAP	19.48885	2	0.0001	14.15148	2	0.0008

D(PB)	0.377777	2	0.8279	7.314212	2	0.0258
All	54.9546	14	0	82.71148	14	0

Dependent Variable : *MF*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi- square**	***df***	***p***	**Chi- square**	***df***	***P***
FII	3.450345	2	0.1781	13.92081	2	0.0009
PROM	0.277533	2	0.8704	19.75564	2	0.0001
RET	9.728961	2	0.0077	0.408588	2	0.8152
VOLAT	1.579946	2	0.4539	9.694972	2	0.0078
TO	0.408466	2	0.8153	19.28004	2	0.0001
MCAP	2.701799	2	0.259	8.630302	2	0.0134
D(PB)	1.870844	2	0.3924	2.793513	2	0.2474
All	26.18969	14	0.0245	73.20393	14	0

Dependent Variable : *PROM*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi- square**	***df***	***p***	**Chi- square**	***df***	***p***
FII	2.584845	2	0.2746	15.66033	2	0.0004
MF	0.568239	2	0.7527	4.418435	2	0.1098
RET	2.280794	2	0.3197	2.053932	2	0.3581
VOLAT	1.820379	2	0.4024	1.240555	2	0.5378
TO	2.152493	2	0.3409	2.575784	2	0.2759
MCAP	8.774314	2	0.0124	7.969685	2	0.0186
D(PB)	0.876427	2	0.6452	34.71144	2	0
All	19.65012	14	0.1416	64.74255	14	0

Dependent Variable: *RET*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi- square**	***df***	***p***	**Chi-square**	***df***	***p***
FII	2.289163	2	0.3184	6.026794	2	0.0491
MF	3.408153	2	0.1819	0.63367	2	0.7285
PROM	3.141507	2	0.2079	0.464136	2	0.7929
VOLAT	0.019509	2	0.9903	45.88506	2	0
TO	1.025551	2	0.5988	2.009601	2	0.3661
MCAP	3.274781	2	0.1945	4.145328	2	0.1259
D(PB)	3.527883	2	0.1714	0.323594	2	0.8506
All	31.22201	14	0.0052	65.08069	14	0

Dependent Variable : *VOLAT*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi-square**	***df***	***p***	**Chi-square**	***df***	***p***
FII	6.604616	2	0.0368	0.280227	2	0.8693
MF	5.561571	2	0.062	14.23426	2	0.0008
PROM	5.703689	2	0.0577	1.002401	2	0.6058
RET	0.358766	2	0.8358	26.93999	2	0

TO	6.017294	2	0.0494	6.049874	2	0.0486
MCAP	26.23293	2	0	91.26429	2	0
D(PB)	16.49941	2	0.0003	8.876344	2	0.0118
All	111.7387	14	0	162.1571	14	0

Dependent Variable : *TO*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi-square**	***df***	***p***	**Chi-square**	***df***	***p***
FII	1.094721	2	0.5785	10.57988	2	0.005
MF	0.459983	2	0.7945	5.917705	2	0.0519
PROM	8.653278	2	0.0132	16.92358	2	0.0002
RET	3.097002	2	0.2126	13.40714	2	0.0012
VOLAT	3.944482	2	0.1391	48.70954	2	0
MCAP	20.01063	2	0	149.0008	2	0
D(PB)	0.56727	2	0.753	0.051024	2	0.9748
All	42.46659	14	0.0001	189.4626	14	0

Dependent Variable : *MCAP*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi-square**	***df***	***p***	**Chi-square**	***df***	***p***
FII	1.822039	2	0.4021	3.119247	2	0.2102
MF	2.956429	2	0.228	1.579759	2	0.4539
PROM	1.344805	2	0.5105	1.935739	2	0.3799
RET	1.165596	2	0.5583	2.067454	2	0.3557
VOLAT	0.209711	2	0.9005	237.9637	2	0
TO	1.265854	2	0.531	54.19256	2	0
D(PB)	6.472395	2	0.0393	0.915199	2	0.6328
All	18.30567	14	0.1932	274.7192	14	0

Dependent Variable : *D(PB)*

	Pre Crisis (2004-2005 to 2007-2008)			Post Crisis (2008-2009 to 2017-2018)		
Excluded	**Chi-square**	***df***	***p***	**Chi-square**	***df***	***p***
FII	0.196458	2	0.9064	0.508769	2	0.7754
MF	2.203651	2	0.3323	0.705148	2	0.7029
PROM	1.003935	2	0.6053	0.104198	2	0.9492
RET	1.790664	2	0.4085	1.295248	2	0.5233
VOLAT	2.139197	2	0.3431	6.095739	2	0.0475
TO	0.350862	2	0.8391	13.82667	2	0.001
MCAP	5.131327	2	0.0769	6.579045	2	0.0373
All	22.94874	14	0.0611	42.78907	14	0.0001

p = 0.0074) and their strong preference for larger (high market capitalization) companies (χ^2 = 19.48885, $p = 0.0001$) with high share turnover ($\chi^2 = 21.3593, p = 0$) is observed, which together signify inadequate access to new value-relevant information and/or inefficient data processing. Larger firms obviously have relatively better

quality disclosure, greater number of analysts following, faster dissemination of new information, and thus less negative return surprises. FII flows are not found to have significant causal influence on stock returns ($\chi^2 = 2.289163$, $p = 0.3184$, that is, H_{03} is accepted for the pre-crisis period) and return volatility ($\chi^2 = 6.604616$, $p = 0.0368$), which is in solidarity with the earlier findings of De and Chakraborty (2015) in that FIIs do not have any significant effect on stock return volatility in the Indian equity markets. However, Bhattacharjee and De (2013) observed that increased FII holdings reduced stock return volatility of companies with good voluntary disclosure, which was not seen in case of companies with poor voluntary disclosure quality.

In the post crisis period, FIIs cease to be return chasers ($\chi^2 = 6.890956$, $p = 0.0319$) and neither share turnover is found to have significant effect on FII flows anymore ($\chi^2 = 4.938568$, $p = 0.0846$), although the preference for larger companies persists ($\chi^2 = 14.15148$, $p = 0.0008$). This may indicate increased understanding of Indian economy and firm fundamentals and improved access to quality information. This explanation is further supported by a feeble ($\chi^2 = 6.026794$, $p = 0.0491$) causal influence of FII flows on returns, which are absolutely not seen during the pre-crisis period, that is, H_{03} is accepted for the post-crisis period.

One of the two very significant changes observed is that FIIs start showing causal influence of promoter's holdings ($\chi^2 = 23.83123$, $p = 0$), whose effect is absolutely non - existent during the pre crisis period ($\chi^2 = 0.527328$, $p = 0.7682$). This may indicate a learning from the fallout of the Satyam Computers scam where a steady decline of promoters' holdings were clearly observable, but the underlying current was outside the radar of analysts and corporates in an unexplained and uncanny way.

The second one is that FII flows in the post-crisis period started to have very significant causal influence on mutual fund flows ($\chi^2 = 13.92081$, $p = 0.0009$) rejecting the H_{01}, which is not observed before the crisis ($\chi^2 = 3.450345$, $p = 0.1781$). Mutual funds also stopped chasing returns after the crisis ($\chi^2 = 0.408588$, $p = 0.8152$). Other than FII flows, promoters' holdings also are found to have causal influence on mutual fund flows ($\chi^2 = 19.75564$, $p = 0.0001$). Return volatility ($\chi^2 = 9.694972$, $p = 0.0078$) and share turnover ($\chi^2 = 19.28004$, $p = 0.0001$) have emerged as very significant determining factors of mutual fund flows. They are not found to have a very significant impact on returns ($\chi^2 = 0.63367$, $p = 0.7285$), and hence, H_{04} is accepted, and mutual funds seem to enhance return volatility ($\chi^2 = 14.23426$, $p = 0.0008$).

Conclusion and Limitations of the Study

The paper deals with the probable association between FII and mutual fund flows in and out of the Indian equity stocks in the pre and post subprime crisis period. Data on FII and mutual fund equity holdings in firms were extracted from quarterly financial statements. Also, the structural break during 2003 reduced the pre-crisis regressable time span. Availability of higher frequency data could provide a larger and more effective dataset to reveal even more dependable findings about the nature of the relationships studied. Notwithstanding this minor limitation in this study, the results of VAR analysis and the successive VAR Granger causality test show a positive and significant association between FII and mutual fund flows.

A very important finding is that both FIIs and MFs were return chasers in the pre crisis period which ceases in the post crisis period, which is a welcome change from MF investors' point of view, as the fund managements now put more emphasis on fundamentals and less on historical returns. Turnover has a significant positive impact on FII flows and the disappearance of this causal influence shows assigning less importance by FIIs on trade of domestic investors.

Scope for Further Research

The findings suggest superiority of FIIs over domestic mutual funds in gathering and processing value relevant

information in the post crisis period and recognition of the same in flow behaviour of mutual funds. Mutual funds are found to herd behind FIIs in the post crisis period ; whereas, no causal relationship is found in the other direction, signifying the acceptance of the superiority of FIIs by MFs in information acquisition and processing. Trust on informativeness of FII trades is reinforced by promoters' behaviour, whose richness in insider information is obvious and beyond doubt as FII flows have been found to precede changes in promoters' holdings. This further emphasizes analysis of information content of FII trades and their evolving role in price discovery during pre and post sub-prime crisis.

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