

# INVESTMENT STRATEGIES OF FIIs IN THE INDIAN EQUITY MARKET

Sanjay Sehgal and Neeta Tripathi

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*In this paper, we empirically evaluate if Foreign Institutional Investors (FIIs) adopt positive feedback and herding strategies in the Indian environment. We find that FIIs exhibit return chasing behaviour when we use monthly data. However, they do not seem to be working on the positive feedback strategy when we use daily files. This may be owing to the fact that they wait for the market information to crystallize and do not react to it in an instantaneous manner.*

*We also observe that the FIIs display strong herding behaviour based on quarterly shareholding pattern. The herding behaviour seems to be stronger at the aggregate level than at the individual stock level. This may be explained by the fact that FIIs are more cognizant of corporate fundamentals at the individual stock level. Further, the market cycle behaviour may vary from such cycles for individual stocks. Our findings have strong implications for domestic financial institutions, portfolio managers, wealth managers and other investors as well as market regulators who wish to have better understanding of FII's behaviour as the later are the dominant investors in the Indian equity market.*

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**Key Words:** *Foreign Institutional Investors, Positive Feedback Strategy, Herding Strategy*

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## INTRODUCTION

THE role of foreign investors in the financial markets is an important unsolved issue in international finance. In the context of Asian financial crisis, it has been alleged that the foreign portfolio investors and the major players therein i.e. foreign institutional investors (FIIs) may have been positive feedback traders (e.g. rushing to buy when the market is booming and rushing to sell when the market is declining) and eager to mimic each other's behaviour ignoring information about the fundamentals. It is often argued that the trades of foreign investors are highly correlated, so that that they buy and sell as a herd.

There is a growing body of research that studies the joint dynamics of capital flows and equity returns (see, for example, Choe *et al.*, 1999; Froot *et al.*, 2001; Clark and Berko, 1997; Richards, 2002; Griffin *et al.*, 2002). The first hypothesis of interest is whether foreign investors are 'return chasers'? Are FII flows caused by changes in

expected returns? A related hypothesis is that international investors are momentum investors, leading to a positive relation between the past returns and FII flows. A second set of hypotheses focuses on the effect of FII flows on returns. Both Froot *et al.*, (2001) (focusing on 28 emerging markets) and Clark and Berko (1997) (focusing on Mexico) find that increases in the capital flows raise stock market prices, but the studies disagree on whether the effect is temporary or permanent. If the increase in prices is temporary, it may be just a reflection of 'price pressure.' If the price increase is permanent, it may reflect a long-lasting decrease in the cost of equity capital associated with the risk-sharing benefits of capital market openings in emerging markets. Krugman (1997) describes money managers as an extremely dangerous flock of financial sheep. This herding could make trades by foreign investors destabilising because foreign investors end up trading as a group, thereby creating disarray and possible panic in the markets that they exit and overheating in the markets that they enter.

Bekaert, Harvey and Lumsdaine (2002a) investigate the joint dynamics of returns and net the U.S. equity flows acknowledging the important effects capital market liberalisation may have. The low level of the U.S. interest rates has often been cited as one of the major reasons for increased capital flows to emerging markets in 1993 (see Calvo *et al.*, 1993, 1994; Fernandez-Arias, 1996). However, Bekaert, Harvey and Lumsdaine (2002a) do not find a significant effect on the capital flows to emerging markets from an unexpected reduction in the world interest rates. In more recent work, the focus has shifted towards the detailed studies of trading behaviour of foreign investors in an effort to detect herding behaviour and other behavioural biases. Two such studies, which focused on South Korea before and during the currency crisis in 1997, are Choe *et al.*, (1999) and Kim and Wei (2002). Choe *et al.*, find evidence of positive feedback trading and herding by the foreign investors before the crisis, but not during the crisis period. They show that trades by foreign investors do not have a destabilising effect on South Korea's stock market. Kim and Wei (2002) find that foreign investors outside Korea are more likely to engage in positive feedback trading and herding strategies than the branches and subsidiaries of foreign institutions in Korea or foreign individuals living in Korea. This difference in trading behaviour is possibly related to the difference in possessed information by the two types of investors.

A general perception about the FIIs is that they are speculators and their investment is motivated by the short-term gains. The FIIs in pursuit of short-term gains adopt short-term trading strategies such as positive feedback trading and herding (i.e. buy or sell stocks together as a group). Such behavioural biases of FIIs, it is believed, may lead to price overreaction and contribute to the creation or exacerbation of a financial crisis.

Since the opening of the Indian equity markets to foreigners, FII investments have steadily grown from about \$4 million in 1993 to \$9332 million in 2005 - 06. Their share in total portfolio flows to India has grown from 47% in 1993 - 94 to around 85% in 2005 - 06. FIIs have also acquired a significant presence in the Indian stock market. In spite of the fact that FIIs have become integral part of the Indian capital market and that there are strongly held views on their trading behaviour biases, little empirical analysis on the subject in the Indian context has been undertaken. In this paper, an attempt has been made to develop an understanding of the trading behaviour of the FIIs in the Indian equity market. Understanding foreign investors' behaviour is also relevant for the discussion on

the desirability of capital controls. Most of the empirical studies concentrate on the aggregate trading by FIIs in India. We attempt to analyse the trading behaviour of FIIs both, at aggregate level and at firm/stock level so as to provide an in-depth analysis on the issue. Further, keeping in view the greater possibility of homogeneity of trading behaviour in one group, our analysis includes all the FIIs rather than one subset of FIIs as data relating to subsets of FIIs is not available in India.

This paper is organised as follows: In section 2, review of literature is presented. Section 3 describes our data and sources. Section 4 and 5 provide methodology and empirical evaluation of positive feedback and herding strategies respectively. Section 6 concludes this paper.

## REVIEW OF LITERATURE

In this section, we provide literature review of the studies dealing with positive feedback and herding behaviour of FIIs. Lakonishok, Shleifer and Vishny (LSV) (1992) use the investment behaviour of 769 the U.S. tax-exempt equity funds managed by 341 different money managers to empirically test for the herd behaviour. Most of the fund sponsors are corporate pension plans, with the rest consisting of endowments and state/municipal pension plans. Since some managers ran multiple funds the unit of analysis is the money manager. Their panel data set covering the period 1985 - 89 consists of the number of shares of each stock held by each fund at the end of every quarter. The funds considered managed a total of \$124 billion, which was 18 percent of the total actively managed holdings of pension plans.

LSV concludes that money managers in their sample do not exhibit significant herding. There is some evidence of such behaviour being relatively more prevalent in stocks of small companies compared to those of the large company stocks (where most institutional trades are concentrated). LSV's explanation is that there is less public information on the small stocks and hence money managers pay relatively greater attention to the actions of other players in making their own investment decisions regarding small stocks. LSV's examinations of herding conditional on past stock performance of herding within certain industry groups and between the industries, and of herding among the subsets of money managers differentiated by size of assets under management, reveal no evidence of herd behaviour. However, as LSV cautions, the impact of herding is difficult to evaluate without the precise knowledge of demand elasticity for stocks. It is possible that even mild herding behaviour could have large price effects.

Dornbusch and Park (1995) argue that foreign investors pursue positive feedback trading strategies that make stocks overreact to the changes in fundamentals. Bohn and Tesar (1996) show a positive contemporaneous relation between the equity flows and stock returns using monthly data for Mexico. Choe, Kho and Stulz (1998) have examined the impact of foreign investors on stock returns in Korea before and after the 1997 Asian crisis using daily trade data. They find evidence of positive feedback trading before the crisis. During the crisis period their study reveals a weakening of the herding effect and disappearance of positive feedback trading by the foreign investors. In addition they find no evidence of a destabilising effect of the trades by foreign investors on Korea's stock market. Using the measure for herding as developed by Lakonishok, Shleifer and Vishny [LSV (1992)], Kim and Wei (2002) also show strong tendencies for herding by the foreign investors and offshore investment funds in Korea in a similar time period. Bonser-Neal *et al.*, (2002) analyse the foreign trading behaviour on the Jakarta Stock Exchange (Indonesia) between 1995 and 2000. They detect herding and positive feedback trading by the foreign investors, but find no evidence to indicate that such trading behaviour by the foreign investors' destabilised the market prices during the Asian crisis. Griffin *et al.*, (2002) use a theoretical model and empirical analysis to show that global stock return performance is an important factor in understanding equity flows. Richards (2002) using data for daily net purchases by the foreigners in six Asian emerging equity markets over 1999 - 2001 gives strong evidence of the positive feedback trading with respect to domestic, the US and regional equity returns.

Grinblatt, Titman, and Wermers (hereafter referred to as GTW) (1995) use data on portfolio changes of 274 mutual funds between end-1974 and end-1984 to examine herd behaviour among fund managers and the relation of such behaviour to momentum investment strategies and performance. Using the LSV measure of herding,  $H(i,t)$ , GTW find little evidence of (economically significant) herding in their sample. The average value of  $H(i,t)$  for their sample is 2.5 is similar to that found by LSV for the pension funds at 2.7. That is, if 100 funds were trading the average stock-quarter pair, then 2.5 more funds traded on the same side of the market than would be expected if portfolio managers made their decisions independently of one another. Disaggregating by past performance of stocks, GTW find that the funds in their sample exhibit greater

herding in buying past winners than in selling past losers. Herding on the sell side is, though, positive and less pronounced and only weakly related to the past performance. This is consistent with some of their other findings, namely, that the average mutual fund is a momentum investor in that it buys past winners but does not systematically divest past losers. And such behaviour leads to some herding in the stocks which have performed well but there is no evidence of herding out of stocks that have earned poor returns in the immediate past.

Wermers (1999) uses the LSV measure and data on quarterly equity holdings of virtually all mutual funds that were in existence between 1975 and 1994 and finds that for the average stock there is some evidence of herding by mutual funds. For Wermers' sample the average level of herding (i.e., of  $H(i,t)$ ) computed over all stocks and quarters for the two decades covered is 3.4. While statistically significant, this value for  $H(i,t)$  is only slightly larger than that reported by LSV (1992) suggesting that there is somewhat greater herding among the mutual funds than among the pension funds. An analysis of trading behaviour, when a larger number of funds are active in a stock, shows that herding by mutual funds does not increase with trading activity and actually falls off as the number of active funds increases. This is due to the fact that stocks traded by a large number of funds tend to be large capitalisation stocks and herding in these is generally lower.

Following up on GTW (1995), who show that positive-feedback strategies are widely used by the mutual fund managers, Wermers (1999) finds that herding levels are somewhat higher among the stocks having large positive or negative returns in prior quarters. Herding on the buy-side is strongest in stocks having high prior quarter returns and sell-side herding is most evident for the stocks with low prior quarter returns. He also finds that positive-feedback investment strategies are more likely to involve the buying of past winners than the sale of past losers. Window-dressing explanations, while consistent with selling losers, does not seem to be an important determinant of herding behaviour since there is not much variation in the sell-side herding levels across the quarters.

To assess whether a sudden increase in buying and selling of stocks by the mutual funds could be driven by new cash inflows and widespread redemptions, Wermers correlates average buying and selling herding measures with various measures of present and lagged cash inflows. He concludes that such flows do not have

much effect on the tendency of the mutual funds to herd into stocks. He also shows that minor portfolio adjustments in the same direction by many funds does not underlie the observed results and that restricting the analysis to trades which exceed 0.1 percent of the total net assets for the trading fund reveals even higher levels of herding.

## DATA

We use two different sets of data for testing positive feedback and herding strategies of FIIs in the Indian equity market. One set comprising of daily and monthly data is used to investigate the presence of positive feedback trading strategy of FIIs in the Indian equity market. The daily file spans from September 2, 2000 to June 30, 2006 and monthly from January 2000 to July 2006. Two data files are being used because daily data gives microscopic view while the monthly data provides broader picture. For finding herding behaviour of FIIs, we use second data set comprising of quarterly shareholding pattern of 30 stocks of BSE Sensex from December 2001 to December 2006. However, shareholding pattern information of one stock viz. Reliance communication Ltd. was not available. Thus the other 29 stocks have been considered for the analyses. Further, herding behaviour of FIIs is analysed both at aggregate level and at firm/stock level. The data source is CMIE database.

We have chosen FII flows in terms of two variables viz. FII inflows (gross purchases) and FII outflows (gross sales) on the assumption that positive feedback trading strategy may change the expectation about the prices which calls for selling when the price falls and buying it when the price rises.

Data on FII equity purchases (inflows) and sales (outflows) on daily and monthly basis are taken from the website of SEBI. The source of daily and monthly closing values of BSE (Bombay Stock Exchange) Sensex is BSE website. The percentage returns are calculated for the BSE Sensex. BSE Sensex has been used as it is the most popular market index and widely used by the market participants for benchmarking.

Returns are defined as;

$$R_t = \ln(P_t/P_{t-1}) * 100$$

where,

$R_t$  = returns at time period  $t$ .

$P_t, P_{t-1}$  = closing value of the stock price index at time  $P_t, P_{t-1}$ .

## AN EMPIRICAL EVALUATION OF POSITIVE FEEDBACK STRATEGY

There are apprehensions that international portfolio investors may be positive feedback traders. Positive feedback trading pattern is one in which one buys securities when the price rises and sells when prices fall. This trading pattern can result from extrapolative expectations about prices, from stop loss orders i.e. automatic selling when the prices fall below a certain point, from forced liquidation when an investor is unable to meet his/her margin calls, or from a portfolio insurance investment strategy which calls for selling stocks when the prices fall and buying it when the prices rise. Hence it predicts a relation between the past performance of the market (as indicated by the value of the market index) and the current FII investment.

As a first step to estimate the positive feedback strategy we do unit root test for checking the presence of unit root in the variables. Augmented Dickey Fuller (ADF) test confirms that variables are stationary. One of the major limitations of regression equation is that it deals with the dependence of one variable on other variables but does not imply causation. In other words, the existence of relationship between the variables does not prove causality or direction of influence. To deal with this issue next we carried out Granger linear causality test. In case of monthly data Granger result shows that market returns cause foreign investment flows in India but in case of daily data cause and effect relationship between FII flows (inflows/outflows) and BSE return is absent (table-1 Panel-A and Panel-B).

There is no indication of positive feedback trading in daily data (table-1 Panel -A). This implies that FIIs do not seem to be reacting spontaneously in the short term rather; they wait for the market information to crystallise before they exhibit any reaction. It may also be possible that the FIIs investment is not led by returns, i.e. the FIIs are not indulging in return chasing but is led by their own trade on daily basis.

A significant and positive relation between lagged monthly returns and FII inflows is observed on the monthly basis (table-1 Panel -B). This positive relationship documents that FIIs are positive feedback traders at the aggregate level tending to buy following good news in the equity market in India.

## AN EMPIRICAL EVALUATION OF HERDING STRATEGY

In this section we explore whether FIIs tend to end up on the same side of the market in a given stock in a given quarter. Herding is the tendency that investors of particular group mimic each others trading behaviour. There is an alternative explanation for herding among the institutional investors. Unlike individual investors, fund manager face regular reviews (e.g. quarterly for the mutual fund and annually for the pension fund) on their performance relative to a benchmark and/or to each other. This may induce them to mimic each other's trading behaviour to a greater extent than they otherwise could be.

We assume that two groups of traders' viz. foreign investors and domestic investors trade in the market. We calculate herding from the foreign investor's perspective. We follow the measure proposed by Lakonishok, Shleifer and Vishny (LSV, 1992) to investigate the extent of herding by FIIs in the Indian equity market. They measure and define herding as the average tendency of a group of money managers to buy (sell) particular stocks at the same time, relative to what could be expected if money managers traded independently. It is called a herding measure because it assesses the correlation in the trading patterns for a particular group of traders and their tendency to buy and sell the same set of stocks. Herding clearly leads to correlated trading, but the reverse need not be true. The LSV measure is as follows;

$$HM = |f(t) - E[f(t)]| - E|f(t) - E[f(t)]| \quad \dots(1)$$

where,

$f(t)$  is the proportion of 'buy' trade by FIIs on day  $t$ .

$E|f(t) - E[f(t)]|$  is the adjustment factor to allow for random variation around the expected proportion of 'buys' under the null hypothesis of independent trading decisions by FIIs. The adjustment factor assumes that  $f(t)$  follows a binomial distribution with the probability  $E[f(t)]$  of success. For  $E[f(t)]$  a proxy that is the average 'buy' trade during the entire period of reference is used.

Implicitly equation (1) defines and measures herding as the tendency of a subgroup of investors to trade a given stock (in our case stock index) together and in the same direction, more often than would be expected by the investors trading randomly and independently. The average of HM over the entire sample period gives the extent to which FIIs herd in India. Values of herding measure significantly different from zero are interpreted as evidence of herd behaviour.

We compute herding using quarterly horizon and find that at an aggregate level herding measure is 9.03%. This implies an extent to which trade by FIIs accumulate on one side of the market is 9.03% higher than the expected had the FIIs trade been independent and random.

We have established so far, that on an average herding trading strategy is being followed by FIIs in the Indian equity market. This further strengthens the possibility of extensive herding in individual stock. We examine individual stock herding measure of FIIs for 30 BSE Sensex stock. To investigate this issue we calculate herding measure of each stock of BSE Sensex. Our measure of herding for a given stock in a given quarter  $H(i, t)$  is defined as follows;

$$H(i,t) = |p(i,t) - p(t)| - AF(i,t) \quad \dots(2)$$

where

$H(i,t)$  is measure of herding in stock  $i$  for quarter  $t$

$p(i,t)$  is the total number of shares held by FIIs in stock  $i$  at quarter  $t$ .

$p(t)$  is average of shares held by FIIs in stock  $i$  at quarter  $t$

The adjustment factor is  $AF(i,t) = E[|p(i,t) - p(t)|]$ , expectation is calculated under the null hypothesis  $p(i,t)$  follows a binomial distribution.

We find that FIIs also herd in the individual stocks but herding in individual stock is relatively less strong than that of the herding at an aggregate level. This is confirmed by the fact that most of the herding ratio of sample companies fall in the range of 2-4 unlike herding ratio of 9 for market as a whole (as shown in table 3). For this two reasons can be cited, firstly it seems that in the individual stock, FIIs do not mimic each others' behaviour but also consider information about the fundamentals. Secondly, it may be possible that a bullish and bearish expectation in an individual stock is different from the bullish and bearish trend of the market as a whole.

## SUMMARY AND CONCLUSIONS

FIIs play a dominant role in the emerging markets including India. Hence, it is important to analyse their investment behaviour as it has strong implications for security pricing as well as market characteristics such as volatility, liquidity and information efficiency. We specifically examined if FIIs adopt trading strategies such as positive feedback and herding strategies in the

Indian environment. We find that FIIs are positive feedback traders at aggregate level when we use monthly returns files. However, we do not get any such evidence when we use daily data. This may probably be due to the fact that FIIs do not react to the market information instantaneously and wait for the return pattern to crystallize. There is a common belief that FIIs investments drive the market and have implications for the policy makers to control their activities. Our results suggest that it is actually the market performance which propels FIIs activity. We find that FIIs exhibits intense herding behaviour at the aggregate level. They also show clustering effect at an individual level which is relatively less. This difference in herding behaviour owe to the fact that individually FIIs also consider stock fundamentals besides mimicking each other's behaviour. Additionally FIIs share expectations more at aggregate level than at the individual level.

Our study has strong implications for the domestic financial institutions, portfolio managers, wealth managers and other investors as well as the policy makers as they shall be interested in understanding the trading behaviour of dominant investor group in the market. For instance, domestic financial institutions may wish to analyse if they have any comparative home advantage vis a vis FIIs, while regulators may like to evaluate if their trading activities cause greater volatility. The herding effect may hasten the speed of adjustment of relevant information into the stock prices making market perhaps more efficient. An examination of FIIs investment behaviour provides us better understanding of the risk-return relationship that emerges in any given financial market.

**Table 1: Panel-A (Daily Data)**  
Evaluating Positive Feedback Strategy: Granger Linear Causality Test

Null Hypotheses	F-static's	Causality Interferences
BSE returns does not granger cause FII inflows	1.589	BSE returns does not cause FII inflows
FII inflows does not granger cause BSE returns	0.478	FII inflows does not cause BSE returns
BSE returns does not granger cause FII outflows	2.08	BSE returns does not cause FII outflows
FII outflows does not granger cause BSE returns	0.186	FII outflows does not cause BSE returns

**Panel –B (Monthly data)**  
Evaluating Positive Feedback Strategy: Granger Linear Causality Test

Null Hypotheses	F-static's	Causality Interferences
FII inflows does not granger cause returns	0.257	FII inflows does not cause BSE BSE returns
BSE returns does not granger cause FII outflows	7.567*	BSE returns cause FII outflows
FII outflows does not granger cause BSE returns	1.09	FII outflows does not cause BSE returns

Note: \*significant at 5% level of significance

**Table 2: Herding Measure of Individual Stocks: LSV (1992)**

Company Name	HM (%)
ACC Ltd.	2.36
Ambuja Cements Ltd.	2.96
Bajaj Auto Ltd.	2.86
Bharat Heavy Electricals Ltd.	1.29
Bharti Airtel Ltd.	1.34
Cipla Ltd.	1.51
Dr. Reddy's Laboratories Ltd.	4.77
Grasim Industries Ltd.	2.27
HDFC Bank Ltd.	3.57
Hindalco Industries Ltd.	1.62
Hindustan Unilever Ltd.	3.81
Housing Development Finance Corporation Ltd.	1.41
ICICI Bank Ltd.	5.06
ITC Ltd.	2.34
Infosys Technologies Ltd.	1.95
Larsen and Toubro Ltd.	1.01
Mahindra and Mahindra Ltd.	3.96
Maruti Udyog Ltd.	1.21
NTPC Ltd.	4.19
Oil and Natural Gas Corporation Ltd.	3.37
Ranbaxy Laboratories Ltd.	3.99
Reliance Communications Ltd.	0*
Reliance Energy Ltd.	6.69
Reliance Industries Ltd.	8.03
Satyam Computer Services Ltd.	2.64
State Bank of India	1.21
Tata Consultancy Services Ltd.	2.88
Tata Motors Ltd.	4.14
Tata Steel Ltd.	7.59
Wipro Ltd.	3.54
Aggregate Market (BSE Sensex)	9.03

Note: \* Data not available.

**Table 3: Frequency Distribution of Herding Measure of Individual Stocks**

Class Intervals (%)	Frequency	Cumulative Frequency
0-2	9	9
2-4	13	22
4-6	4	26
6-8	2	28
8-10	1	29

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**Sanjay Sehgal** (sanjayfin15@gmail.com) is PhD in Finance from *Delhi school of Economics, Delhi University* and has one post Doctorial research on 'Multi Factor Asset Pricing' from the Department of Accounting and Finance, *London School of Economics*, the U.K.. He has completed two major research projects on Mutual Fund Performance Evaluation and Asset Pricing. He has authored a book titled "Asset Pricing in Indian Stock Market" and has written about 30 research papers which have been published in the leading journals. He has acted as a research person for EDP programme organised by Stock Holding Corporation of India (SHCI), ICICI Prudential Mutual Fund, PEC Ltd, and NIFM etc. His areas of specialisation are investment analysis, portfolio management and financial econometrics.

**Neeta Tripathi** (neeta\_2612@yahoo.co.in) is PhD from *Delhi University*. Her areas of specialisation include finance and international business. Presently, a lecturer at *Dyal Singh College (M), Delhi University*, she has about eight years of teaching experience at undergraduate and post-graduate levels. She has authored a book titled "Foreign Trade and Investment in India- Policies and Performance" and has written several research papers and articles published in the reputed journals.



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