The Impact of FII Investment on Indian Stock Market Return

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Abstract

FIIs have been the backbone of the Indian stock market for the past few years and the sole reason for the buoyancy of the Indian equity market. Even a few additional hundred dollars invested by FIIs have lifted the market to greater heights, improving the market sentiment. With FIIs making a U-turn in June many feel the dream-run for India and the Indian market is over. The bleak GDP growth and industrial production growth make matters worse.

Until now, as the saying goes 'their pain was our gain.' The crisis in West Asia and Europe came as a breather for India earlier. Meanwhile both Bank of England (BOE) and European Central Bank (ECB) have kept rates unchanged. In fact both the BOE and the ECB have been assuring their economies that they are willing to keep rates low for a considerable period of time.

This research paper is mainly to analyze the cause and effect relationship between the FIIs investment and stock market for the period 2002 to 2012.

Keywords: FII, GDP, BSE Sensex

1. Introduction

Developing countries like India are generally capital scarce. This is because of low levels of income in comparison with other developed countries, which in turn means savings and investments are also lower. However, there is another way in which a country can attract foreign money. This is by way of Foreign Direct Investment (FDI). However there is a slight difference between them. FDI is defined as "long term investment/ acquisition and is associated with investment in capital assets that a parent company makes in a foreign country which eventually leads to creating employment in India. It manifests in various forms i.e. leading to change in management, transfer of technology, increase in production etc. Examples of FDI would include POSCO setting up a steel plant in Orissa (in-bound FDI), Tata buying Arcelor (out-bound FDI) and so on. It is perceived to be beneficial because it increases production, brings in more and better products and services besides increasing the employment opportunities and revenue for the government by way of taxes. Considering the investment is long term in nature, they cannot be immediately converted into cash and are often only liquidated in a worst-case scenario. These institutions are generally mutual funds, investment companies, pension funds and insurance houses.

Growing India needs abundant foreign capital in the form of FDI and FII for the development of basic infrastructure like roads, railways, sea ports, warehouses, banking services and insurance services etc. Moreover, rapid industrialization since 1991 has further strengthened the need of foreign capital across various industries. Many developing countries suffer from severe scarcity of funds in highly capital intensive areas such as infrastructure. This problem can be diverted to the foreign capitalists by allowing them to invest. In other words, foreign capital are the panacea for the scarcity of all resources.

The variations in the cost of capital are also one of the important factors resulting in attracting foreign capital in India. For example; interest rates are high in India compared to developed economies. In several countries the interest rates are as low as 1% to 3%, whereas in some countries like India the interest rates are very high as 8% to 10% per annum. Thus, for enterprises in India, foreign capital is an easy route to reduce the cost of capital. Thus investors tend to invest in countries like India where they can gain maximum return on their investments. Gradual integration of global financial markets ultimately results in explosive growth of FDI around the globe.

2. Review of Literature

Karimullah(2009) examined the statistical significance of the bi-directional relationship between equity investment behaviour of foreign institutional investors (FIIs) and the Indian stock market efficiency for the period of June 2002 - June 2008. However, it should be recognized that the stock market efficiency may not be the only factor (it may not have any impact at all) affecting investment behaviour of FIIs in India. Hence, he had included some other possible determinants such as exchange rate, regulatory reforms, stock return volatility in India, return in the emerging stock markets, the stock market return and interest rate in developed stock market (USA) in the analysis. Econometric analysis is conducted through multiple regression analysis. ARCH/GARCH model has been used in the analys is to examine the effect of the good and bad news in the stock market on foreign institutional investors.

Chakrabarti (2001) has undertaken to throw some light on the direction of causality between FII flows and Indian stock market returns using data on both the variables. The study has revealed that FII flows are caused by rather than causing the national stock market returns. The slight evidence of a reversion of causality running from flows to returns as well as policy implications because of the potential of FII flows to aggravate the crisis already set in the stock market.

Machhi Hetal and Singhvi Aabha have the opinion that FII has a direct relationship with the volatility in the market. When they turn into a buyer, the market response is positive i.e. market goes up and vice-a-versa. The paper focuses on FII, their activities, contribution and how they are co-related with the volatility in the stock market. Here stock market-BSE sensex data from January 2007 to December 2009 is covered for the analysis purpose.

Rai, K, and Bhanumurthy N R (2003) studied the determinants of foreign institutional investment in India during the period 1994-2002. They found, using monthly data, that the equity returns is the main driving force for FII investment and is significant at all levels. They further studied the impact of news on FII flows and found that the FIIs react more (sell heavily) to bad news than to good news.

Richards, A. (2004) has analyzed data of six Asian emerging equity markets and found two interesting findings. The trading behaviour of foreign investors was largely influenced by the return in global market that is positive feedback trading. The price impact associated with foreign investors trading was much large than estimated earlier.

Sivakumar S (2003) has analyzed the net flows of foreign institutional investment over the years. He also briefly analysed the nature of FII flows based on research, explored some determinants of FII flows and examined if the overall experience has been stabilizing or destabilizing for the Indian capital market.

Mukherjee, P, Bose, S and Coondoo, D (2002) suggest that FII flows to and from the Indian market tend to be caused by returns in the domestic equity market and not the other way round. In a subsequent study, Bose and Coondoo (2004) have found mild evidence of bi-directional causality between returns on the BSE stock index and FII net inflows and reasoned that it may have been due to heightened FII inflows caused by an upsurge in global equity markets.

Kumar, Sundaram (2009) have found FII data to be I (0) i.e. it doesn't have a unit root at conventional level. It also gives positive unidirectional granger causality results i.e. stock returns granger cause FII. No reverse causality is seen even after inserting a structural break in 2003, as some of the researchers suggest. The recent plummet and surge in inflows warrants a fresh investigation to shed light into the unsettled issue of causality relationship between FIIs and market returns in the Indian context, thus we will try finding that whether higher returns lead international portfolio flows or the other way round.

Takeshi (2008) reported unidirectional causality from stock returns to FII flows irrelevant of the sample period in India whereas the reverse causality works only post 2003. However, impulse response function shows that the FII investments in India are more stock returns driven. Perhaps the high rates of growth in recent times coupled with an increasing trend in corporate profitability has imparted buoyancy to the stock markets, triggering off return chasing behaviour by the FIIs.

Griffin, J.M., Nardari, F. and Stulz, R.M. (2004) found that foreign flows are significant predictors of returns for Korea, Taiwan, Thailand and India, indicating that foreign investors buy before market index increases. They also found that simultaneous flows are positive and highly significant in India. FII and Stock Index show positive correlation, but fail to predict the future value.

Lin, A. and Chen, C.Y. (2006) conclude that the investment performance of FIIs high holding stocks is significantly better than that of FIIs low holding stocks. They presented the evidence that FIIs trading behaviour has generated better returns and portfolio performance since the stock market's full liberalization. There was a surge in capital inflows into India too since 1992 as investors tend to study companies more thoroughly. The involvement of foreign investors disseminates information better hence leads to more efficient market.

Chang Su has generated a practical case to measure the variation of return volatility in high fluctuating stock markets that may exhibit different characteristics from the relatively stable stock market. Hence, the main purpose of this paper is to analyze whether the long term volatility is more extensive during the crisis period than before the crisis, and compare the movements of the return volatility of Chinese stock market to the other stock markets before and throughout the crisis period. They apply the daily data from January 2000 to April 2010 and split the time series into two parts: before the crisis and during the crisis period. The analysis is based on

employing both GARCH and EGARCH models. The empirical results suggest that EGARCH model fits the sample data better than GARCH model in modelling the volatility of Chinese stock returns. The result also shows that long term volatility is more volatile during the crisis period. Bad news produced stronger effect than good news for the Chinese stock market during the crisis.

3. Research Methodology

3.1 Objectives

1. To analyze the cause and effect relationship between the FIIs investment and stock market.
2. To analyze the relationship between FII equity investment pattern and BSE Sensex, mid cap and small cap indices.
3. To analyze the volatility of BSE Sensex due to FIIs.
4. To study the behavioral pattern (market trend) of FII in India during 2002 to 2012.
5. To study the impact of market opening to FIIs (introduction of FII), on Indian stock market behavior.

3.2 Scope of study

Table 1

Index	Time period
BSE sensex, BSE 100, BSE 200, BSE 500	September 2002 to September 2012
BSE MID cap	April 2005 to September 2012
BSE SMALL cap	April 2005 to September 2012
BSE sensex	360 days before and 360 days after event day*

*Event day is the day on which FII is allowed to invest in Indian stock market i.e 14th September, 1992

Universe Indices of BSE

Sampling Unit:- BSE sensex, BSE 100, BSE 200, BSE 500,mid cap and small cap indices.

Sampling period:-

BSE index: September 2002 to September 2012.

mid cap, small cap: April 2005 to September 2012.

3.3 Sources of data

To collect the data websites of SEBI, RBI and Money Control were visited for collecting monthly data of FII purchase, sales and net investment for the above mentioned period. Also websites of BSE and NSE were visited for collecting monthly data of BSE sensex, mid cap, small cap as well as data of monthly market capitalization. Besides we have referred from journals, books and research papers.

3.4 Research Analysis Tools

3.4.1 Regression Analysis

The basic regression equation takes the following form for the present study.

Regression function

$$R_{it} = \beta_0 + \beta_1 \left[\frac{FLOW_t}{MARKETCAP_{t-1}} \right]$$

Where,

R_{it} = Return from market i at time t.*

$FLOW_t$ = FII flow at time t.

MARKET CAP_{t-1} = Market capitalization of market i at time t-1.

$$*R_t = \log_e \left[\frac{P_t}{P_{t-1}} \right]$$

3.4.2 Correlation

Correlation tool is used to determine whether two variables of data (FII net investment and market return) move together or not.

3.4.3 Paired T- test

The Paired Samples T Test compares the means of two variables. It computes the difference between the two variables for each case, and tests to see if the average difference is significantly different from zero.

A paired t-test is used to compare two population means where you have two samples in which observations in one sample can be paired with observations in the other sample.

3.5 Hypotheses

H_1: There is significant relationship between Sensex return and FII equity investment.

H_2: There is significant relationship between FII equity investment and volatility of sensex.

H_3: There is no significant difference between average return before the event day and after the event day

H_4: There is no significant difference between volatility before the event day and after the event day

Data Analysis and Interpretation
Table 2

BSE sensex and FII equity investment

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.644[a]	.414	.409	5.86508627	.414	84.139	1	119	.000	1.947

Return as per Model = -1.844+ 24.629 (net flow$_{t/}$ marketcap$_{t-1}$)

Table 2

BSE small cap and FII net equity investment

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.664[a]	.441	.435	8.61845231	.441	68.704	1	87	.000	1.979

Return as per Model = -3.477+ 42.204 (net flow$_{t/}$ marketcap$_{t-1}$)

Table 3

BSE mid cap and FII net equity investment

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.704[a]	.495	.490	7.24985935	.495	85.413	1	87	.000	1.931

Return as per Model = -3.028+ 39.584 (net flow$_{t/}$ marketcap$_{t-1}$)

Table 4

BSE 200 and FII net equity investment

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.644[a]	.415	.410	6.30961961	.415	84.256	1	119	.000	1.945

Return as per Model = -2.068+ 26.514 (net flow$_{t/}$ marketcap$_{t-1}$)

Table 5

					Change Statistics					
BSE 500 and FII net equity investment										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.645[a]	.417	.412	6.40460333	.417	84.964	1	119	.000	1.933
Return as per Model = -2.099+ 27.026(net flow$_{t/}$ marketcap$_{t-1)}$										

Figure 1

Correlation analysis
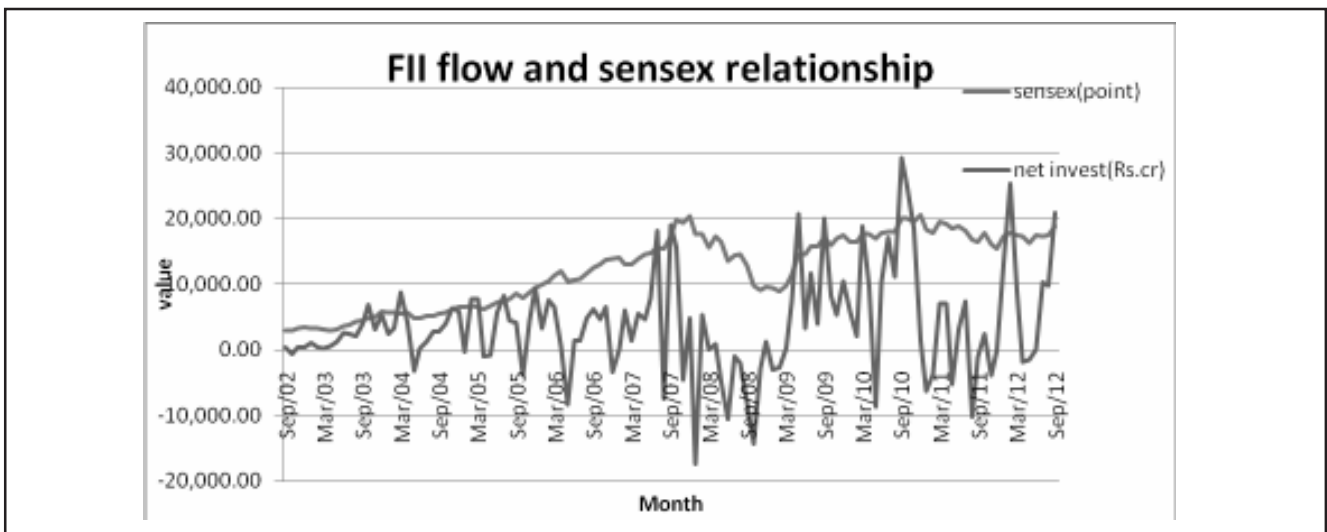
In Figure 1 it is seen that for the sample period the fluctuations in FII net flow are larger than that of sensex value. It is also seen that up to Jan 2008 there is increasing trend in sensex while FII net flow has no specific trend; there are many ups and downs.

Table 6

Index	Correlation	Relationship	Variation
BSE sensex	.261	Positive	Not significant
BSE 100	.265	Positive	Not significant
BSE 200	.271	Positive	Not significant
BSE 500	.267	Positive	Not significant
BSE mid cap	.292	Positive	Not significant
BSE small cap	.271	Positive	Not significant

The direction of the dependent variables change depends on the sign of the coefficient. Here, the coefficient is a positive number, so the dependent variable BSE index will move in the same direction as the independent variable FII net equity flow. But if the coefficient is negative, then the dependent variable will move in the opposite direction of the independent variable. If the correlation coefficient varies from 0 to 0.5 than there is no significant relationship between two variables. And if the correlation coefficient varies between 0.5 to 1 than there is significant relationship between two variables.

But here it is between 0 to 0.5 for all cases so there is no significant relationship between BSE index and FII net equity flow.

Correlation matrix

The cross - correlations between net FII flows / BSE market capitalization and BSE sensex return and lagged one month value of both the variables is found out and shown in the following table.

Table 7

Variables	Monthly returns on BSE National Index	Monthly returns on BSE National Index lagged one month	Monthly net FII flows as a proportion of previous month's BSE market capitalization lagged one
Monthly net FII flows as a proportion of previous month's BSE market capitalization	.446	.309	.386
Monthly net FII flows as a proportion of previous month's BSE market capitalization lagged one	.104	.416	1
Monthly returns on BSE National Index lagged one month	.119	1	.416

The correlation coefficients of Table 7 suggest that there is a positive relationship between the variables, though not quite significant in nature. The estimated variables also appear to be positively correlated with its own lagged terms thereby indicating that past FII flows or BSE index returns respectively affect simultaneous flows or returns.

Paired T- test

Here, we have taken BSE sensex return of 360 trading days before the entry of FII(14th September, 1992) and 360 trading days after the entry of FII. There after we have made windows of 330 days before and after, then 300 days before and after and so on. We have found out average return and standard deviation for each of the windows.

H_0: There is no significant difference in Indian stock prices return before the event day and after the event day.

Ha: There is significant difference in Indian stock prices return before the event day and after the event day.

Table 8

Testing the average return change

Windows	Return before	Return after	P value
+30	.429595	-.796571	.018
+60	.070601	-.552884	.149
+90	-.038435	-.237625	.678
+120	.388475	-.328320	.088
+150	.356401	-.276244	.052
+180	.305341	-.261171	.047
+210	.323333	-.141516	.065
+240	.376209	-.097014	.055
+270	.348847	.004804	.084
+300	.329991	.045724	.155
+330	.349028	.030884	.105
+360	.232843	.030569	.257

Significance level: 95%

If P-value is less than á (0.05), null hypothesis will be rejected and if P-value is more than á (0.05), null hypothesis will not be rejected.In Table 8, +30 days and +180 days p-value is less than á so null hypothesis will be rejected that means there is significant difference in Indian stock prices return before the event day and after the event day.

But in all other remaining windows p-value is more than á so null hypothesis will not be rejected that means there is no significant difference in Indian stock prices return before the event day and after the event day.

Figure 2

Market return change

Table 9
Testing the market volatility change

Windows	S.D. before	S.D.after	P-value
+30	2.0363975	1.9627353	.018
+60	2.7674859	2.1817686	. 149
+90	4.0421591	2.0400126	.678
+120	3.8834317	2.2038435	.088
+150	3.5100998	2.1465801	.052
+180	3.2831944	2.0484592	.047
+210	3.1144360	2.0467983	.065
+240	2.9932695	1.9740240	.055
+270	2.8643420	1.9493602	.084
+300	2.7564346	2.0061292	.155
+330	2.7739581	2.0054448	.105
+360	2.8298774	1.9396459	.257

If P-value is less than á (0.05), null hypothesis will be rejected and if P-value is more than á (0.05), null hypothesis will not be rejected. Here, in +30 days and +180 days p-value is less than á so null hypothesis will be rejected that means there is a significant difference in Indian stock prices volatility before the event day and after the event day.

But in all other remaining windows p-value is more than á so null hypothesis will not be rejected that means there is no significant difference in Indian stock prices volatility before the event day and after the event day.

From the above table it is seen that there is difference between the stock price volatility before and after the event day but the degree of difference is not significant.

Figure 3

Market volatility change
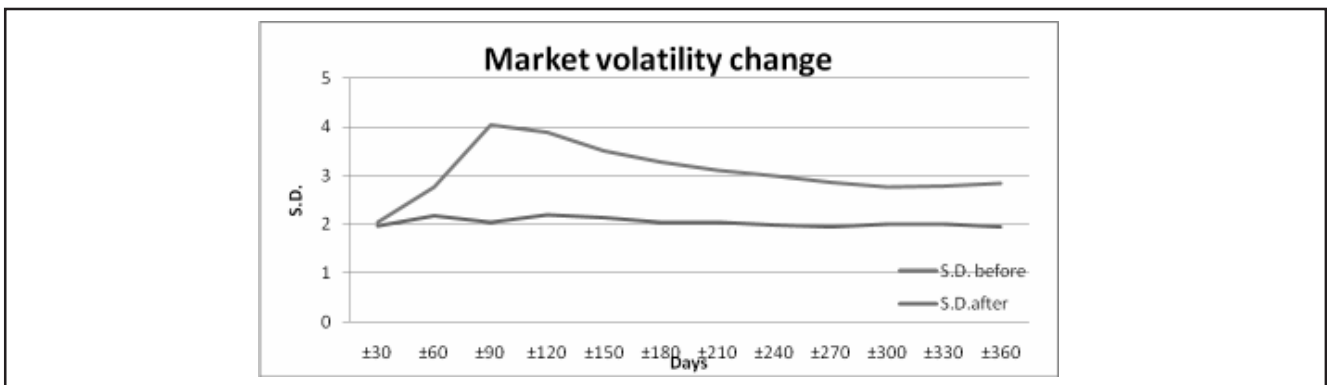
Descriptive statistics

The histogram and summary descriptive statistics of monthly net FII flows, monthly net FII flows as a proportion of previous month's BSE market capitalization and monthly returns on BSE National Index over a 121 month window (September 2002 to September 2012) are presented in figures and tables below in order to depict the trend in the two estimated variables over the sample period.

Figure 4
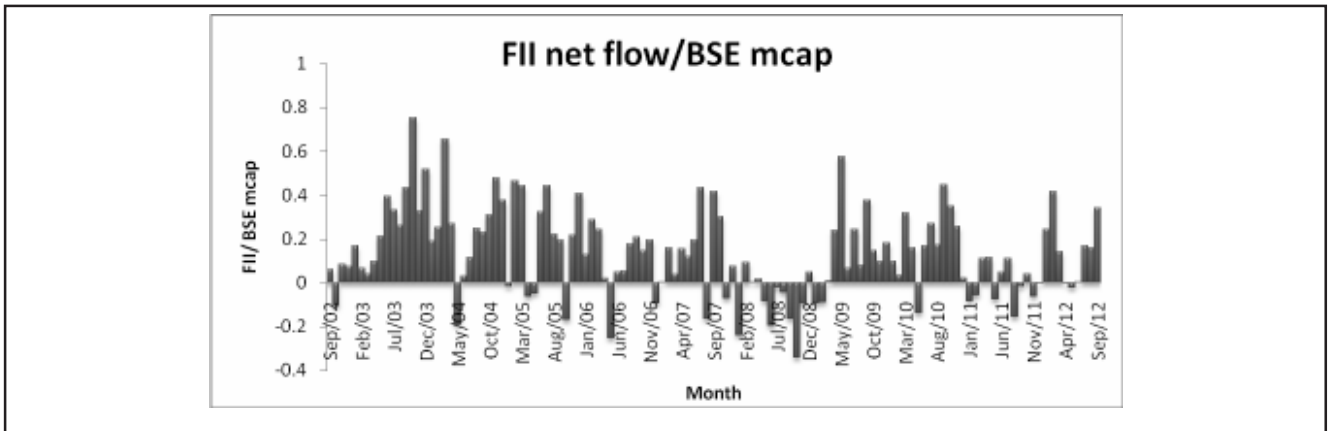
Table 10

Skewness is a measure of symmetry, or the lack of symmetry. A distribution, or data set, is symmetric if it looks the same to the left and right of the centre point. Kurtosis is a measure of whether the data are peaked or flat relative to a normal distribution. Here, we have shown the histogram that is an effective graphical technique for showing both the skewness and kurtosis of data set. In table 10 it is seen that the value of skewness is .362 that is between -0.5 and +0.5 so the data are approximately symmetric. Here, from the table it is seen that kurtosis has the value of 0.149 which is lower than 3. So compared to a normal distribution, its central peak is lower and broader, and its tails are shorter and thinner.

Figure 5
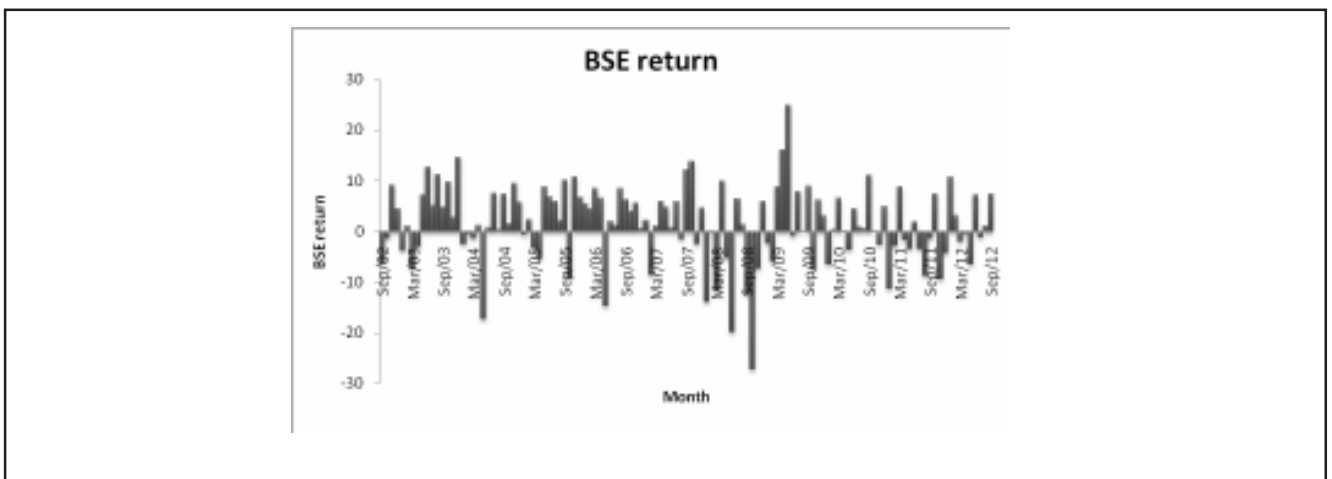
Table 11

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
bse return	121	52.1843	-27.2992	24.8851	1.466616E0	7.6309877	58.232	-.593	.220	1.666	.437
Valid N (listwise)	121										

In table 11 it is seen that the value of skewness is -0.593 that is between -1 and +1 so the data are highly skewed. While the kurtosis value is less than 3. So compared to a normal distribution, its central peak is lower and broader, and its tails are shorter and thinner.

4. Findings

4.1 Regression analysis

1. The determinant of correlation coefficient (R^2) is around 0.4. It means that fluctuations in the BSE indices return are due to FII flows only to the extent of 40% while remaining 60% fluctuation is due to other extraneous variables like exchange rate, interest rate, government policy, political factors, and speculative trading.

2. The return of BSE indices calculated as per the regression model and actual market return are found to be different but not significantly different. For any change in FII net flow, BSE return is changed by 25 to 30% of FII net flow intercept.

4.2 Correlation

1. The performance of the BSE indices is positively related with FII net flow. It means both the variables are moving in the same direction, but the degree of relationship is not significant as correlation is far from +1.

2. According to cross correlation matrix it is found that the estimated variables i.e. BSE return and proportion of FII flow to market cap also appear to be positively correlated with its own lagged terms.

4.3 Paired T- test

1. Upto the 90 days prior to FII entry and post to FII entry there is significant variation in the return of BSE sensex. As the time moves far from the FII entry date the variation in the return is reduced.

2. It is found that prior period returns were positive while the return post to FII entry was negative up to 270 days. From 270 days onward after entry, return has again become positive but still found significantly less than the return before the FIIs entry for the same periods.

3. It can be clearly witnessed here that volatility after the passage of 30 days started declining in comparison to the same period before the entry of FIIs.

4. It is also found that before the introduction of FII market volatility is high compare to that of after the entry of FII. Volatility after entry of FII is remaining more or less stable than that of prior period that shows the market efficiency.

5. Conclusion

1. It can be said that while return declined reasonably after the entry of FIIs, the volatility has been reduced significantly after their entry. It means volatility in Indian market is not the function of FIIs investment flows. There may be some other reasons which induced the volatility in Indian market over the time.

2. It is evident from the analysis that there is no cause and effect relationship between sensex return and FII net flow as a proportion of previous month's market cap.

3. The relationship between BSE indices and FII net flow is positive but the degree of relationship is not significant.

4. FII flow is not the only determinant that affects the behavior of stock market.

5. Information availability spread of information and investor's expectations also affect the daily stock market movement.

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