

## Do FIIs Truly Influence Emerging Stock Market of India?

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### **Abstract**

*The emerging markets have more potential to grow but less capacity to make capital formation therefore these markets also look at developed markets in order to attract capital for its business activities. The FIIs have appeared as remarkable players in the Indian stock market and their rising contribution appends development of stock market in India. Indian stock market has reached novel heights and became more volatile. Continuous evidences are obtained by researchers indicating the volatility shifts on the stock market due to the behavior of FIIs. Therefore the main objective of present study is to examine the impact of FPIs/FIIs flow on Indian stock market. The present study has taken daily observations of FPIs/FIIs (Net Purchase/Sale = Gross Purchase-Gross Sales) in Indian stock market and S&P BSE Sensex index from April 2004 to March 2015. The volatility in the movement of foreign institutional investors' funds is too high. The Results obtained through other econometrics tools are reasonably fascinating and may have a striking effect on the strategies of domestic and international investors before investing in Indian stock market.*

**Keywords:** FIIs/FPIs, Indian Stock Market, Correlation, Johansen Test of Co-integration, Granger Causality, VECM

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### **Introduction and Background of Study**

The capital markets are a platform to provide funds to fulfill the demand of corporate houses by supply of funds provided by investors looking for more reward as a risk premium on stock market avenues. It also serves another purpose for international investors. The capital markets also help in channelizing the funds from less productive capital markets to more productive capital market. In other words as the developed markets of the world have already reached to their maximum potential therefore the returns on these markets are lesser than the returns provided by emerging markets as these markets have more potential to grow in future at a faster rate. The emerging markets have more potential to grow but less capacity to make capital formation therefore these markets also look at developed markets in order to attract capital for its business activities. The historical evidences have shown that prior to 1990s the emerging markets were obtaining foreign capital in the form of bilateral or multilateral financial assistance. Cho (1986) talked about financial liberalization in equity capital also for an efficient market place. Even an emerging country like India opened its doors for private foreign capital after 1990s. It was the result of policies initiated by international organization like IMF and World Bank that pushed the emerging markets to open their doors for investors in developed markets. Till 1980s Indian economy was a closed economy for foreign investors but during 1990s the Government of India realized the role of foreign investment in the economic growth of country.

Therefore a wave of economic reforms was pioneered in the Indian capital market with the objective to fasten the pulse of development in all economic activities. Initially, through New industrial Policy, 1991 the Government of India gave importance to the FDI for technological upgradation and afterwards in September 1992 the Government of India permitted the portfolio investment by FIIs. The initial guidelines were given by Narsimham Committee for the flow of capital in the country by FIIs. The foreign institutional investors were consisted of various mutual funds, overseas pension funds, AMCs, investment trusts, banks, endowments, institutional portfolio managers, and charitable societies etc. The FIIs have generally invested for short term duration in Indian stock market. Some relevant research in this field was conducted in mid of 90s. These studies include Tesar and Werner (1994, 1995), Bohn and Tesar (1996), Brennan and Cao (1997). The evidences obtained through these studies have indicated that a positive and contemporaneous correlation exists between the performance of a stock market and flow of funds by FIIs. In a research study by Calvo, et al., (1999) it was documented that many times the foreign investors pursue irrational trading strategies such as herding and quick changes in their sentiments results in more volatility in the emerging markets and they argued that because of information disadvantage and diversified international portfolio investment incentivize the rational herd behavior which cause more volatility in financial markets of the emerging economies. Further the large and sudden reversals by foreign equity investor make the financial markets extremely volatile (Fitz Gerals, 2003). But Errunza (2001) has documented that flow of FIIs does not increase the stock return volatility in a significant manner. Therefore mixed opinions are found in academic literature regarding the significance of FIIs in affecting the volatility of stock market.

Stanley Morgan (2002) has examined that FIIs have played a very important role in building up India's forex reserves and significantly contributes in the economic growth. The report has further documented that in case of bear market the movement of the FIIs affect the short term fluctuations. In India, the RBI is administering the flow of FIIs in both primary and secondary market through its Portfolio Investment Scheme (PIS). There was a significant rise in FIIs inflow in Indian markets after 2002. The following figure has given the facts and figures related to trend in FIIs investment in India. Except for the year 2008 (the time period of financial crisis) it has remained positive and in general has shown an increasing trend.

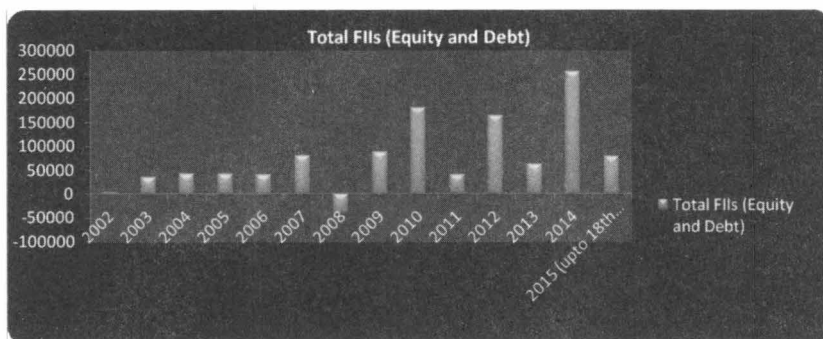


Figure 1

The FIIs have appeared as remarkable players in the Indian stock market and their rising contribution appends development of stock market in India. Indian stock market has reached novel heights and became more volatile. Continuous evidences are obtained by researchers

indicating the volatility shifts on the stock market due to the behavior of FIIs. The portfolio investment made by foreign institutional investors affects both the efficiency and volatility of stock market. Many research studies (Agarwal, 1997; Chakrabarti, 2001; Batra, 2003; Badhani, 2006) have indicated that due to huge size of portfolio investment by FIIs the stock markets behave very sensitive to such investments. Volatility or movements in the stock prices is triggered by the flow of market information at domestic level as well as international level i.e. stock markets of other countries. There can be information spillover from one stock market to another stock market due to advanced trading mechanism and investment patterns. Therefore return pattern of two stock markets might influence each other. The literature has indicated that both stock market performance and FIIs affect each other. In one of such studies conducted by Chakrabarti (2001) has indicated that the Asian crisis has been a striking point explaining the role of FIIs. In this study, it was identified that before Asian crisis the FIIs have positively affected the equity returns but an opposite relationship was noticed in case of post-Asian crisis when it was noticed that the equity returns were causing change in the flow of FIIs. So it is of vital importance for portfolio managers to understand the impact of global investment on stock market performance to develop better hedging and diversification strategies for their clients. In addition to long run association between stock market performance and FIIs flows, certain studies like Mukharjee et al, 2002 and Gordan and Gupta 2003 have indicated short run relationship between stock return series and flow of FIIs. Such evidences of causal relationship between stock market performance and flow of FIIs are also an indication of relevance of the subject matter of present study. In a study by Kumar (2006) it is evidenced that the Indian stock market behavior can be explained with the direction of FIIs funds. The sensitivity of Indian stock market towards FIIs movement can be noticed through a research study conducted by Kumar and Vashisht (2009) in which they mentioned that equity market in India lost 60% of its value due to withdrawal of funds by foreign institutional investors.

Due to more digitized stock market with advance softwares for trading of stock market products and access of investors across the world stock market may cause information spillover from one bourse to another. Consequently it is important to identify if some co-integration exists between the global investment and stock market performance or not. In a more recent study by Verma and Prakash (2011) some interesting evidences were obtained. In their study it was documented that it is movement of BSE Sensex and not the interest rate which plays major role in attracting the FIIs. It indicates the relevance of mutual relationship of stock market performance and flow of FIIs. In one more study, Srikanth and Kishore (2012) examined the cause and effect relationship between FII and Indian capital market for the period April 2003 to March 2011 and concluded that there was bi-directional causality between net FII inflows and the BSE Sensex which mutually reinforce each other. In nutshell they concluded that net FIIs flow had a positive impact on the Indian Stock Market and Foreign Exchange Reserve.

Therefore the present paper is focused to examine the impact of FIIs on Indian Stock markets. The main objective of present study is to examine the impact of FPIs/FIIs flow on Indian stock market. In order to achieve this objective, the following questions have been focused in the present study.

1. Is there any correlation in the flow of FPIs/FIIs and equity stock prices in India?
2. Is there any co-integration between the movement of FPIs/FIIs in India and movement in equity stock prices?
3. Does FPIs/FIIs flow cause change in equity stock returns in India?

## Data Inputs and Research Methodology

The present study has taken daily observations of FPIs/FIIs (Net Purchase/Sale = Gross Purchase-Gross Sales) in Indian stock market and S&P BSE Sensex index from April 2004 to March 2015. The S&P BSE Sensex has been considered as a proxy of Indian stock market. The data of net investment by FPIs/FIIs have been obtained from the official website of Security Exchange Board of India ([www.sebi.gov.in](http://www.sebi.gov.in)) which a regulator of Indian Stock Market. And data for S&P BSE Sensex has been obtained from official website of Bombay Stock Exchange ([www.bseindia.com](http://www.bseindia.com)).

In the beginning, simple descriptive statistics has been used to capture the basic features of both variables of the study. Thereafter Karl Pearson's test of correlation has been used to study the correlation between the variables of the study.

Before applying econometrics tools to study the mutual behavior of two variables of the study it is important these two time series are stationary. There cannot be any reliable forecasting from time series variables if they are non-stationary. And moreover the results of a regression equation can also be spurious on if time series data is not stationary in nature. Therefore unit root test has been used to test the stationarity of time series data. And for this Augmented Dickey Fuller (ADF) has been used. It is based on first-order auto regression coefficients of the time series. A time series having a unit root coefficient  $\pm 1$  indicates that the series is non-stationary. Further the present study has taken Johansen co-integration test to examine the significance of association between the movement of FPIs/FIIs in Indian stock and performance of return series of market benchmark. The Johansen test of co-integration of vector autoregressive framework of order  $p$  is as under.

$$X_t = A_0 + \sum_{j=1}^p B_j X_{t-j} + e_t$$

Where  $X_t$  is an  $n \times 1$  vector of non stationary I(1) variables,  $A_0$  is an  $n \times 1$  vector of constants,  $p$  is the maximum lag length,  $B_j$  is an  $n \times m$  matrix of coefficient and  $e_t$  is a  $n \times 1$  vector of white noise terms. The co-integration test shows the existence of co-integrated equation and hence it requires further diagnosis is done by using unrestricted VAR, i.e., Vector Error Correction Model (VECM). The following equation of vector error correction model is used to run VECM.

$$\Delta X_t = A_0 + \sum_{j=1}^{p-1} r_j \Delta X_{t-j} + \Pi X_{t-p} + e_t$$

Where,  $\Delta$  is the first difference operator,  $X_t = A_0 + \sum_{j=1}^p B_j$  and  $\Pi = -1 + \sum_{j=1}^p B_j$ , and  $I$  is an  $n \times n$  identity matrix. Further the various tests for diagnosis of coefficients, residuals and model fit are used to examine the association and causality between S&P BSE Sensex and various macro economic variables. And at the end in order to identify pair-wise causality, Granger test of causality has been used. The Granger approach to the question of whether  $x$  causes  $y$  is to see how much of the current  $y$  can be explained by past values of  $y$  and then to see whether adding lagged values of  $x$  can improve the explanation.

## Empirical Evidences and Findings of the Study

Table I has shown the results of descriptive statistics. The volatility in the movement of foreign institutional investors' funds is too high. The coefficient of standard deviation has indicated this. Further the distribution pattern in the daily return series of BSE Sensex and FPIs/FIIs has

been identified as asymmetrical and non-normal with the help of skewness kurtosis coefficients and probability of Jarque-Bera statistics.

**Table I Result of Descriptive Statistics**

	<i>BSE Sensex</i>	<i>FPIs/FIIS</i>
Mean	0.015999	-0.5114
Median	0.013837	-0.275207
Std. Dev.	0.069507	11.69378
Skewness	-0.168158	-3.350609
Kurtosis	4.700776	65.48947
Jarque-Bera	19.78784	26003.11
Probability	0.000050	0.000000

Before applying any test to examine the co-integration between Indian stock market and FIIs/ FPIs movement it is essential to see that both time series shall not be suffering from the problem of multi co-linearity. For this basic correlation analysis was done and it was identified that both the variables of the study have lesser degree (0.192) of correlation. Hence we can assume that further study of co-integration between these two variables will not give any spurious results.

After examining the basic correlation between Indian stock market benchmark and FIIs, the next step has made an attempt to find out whether these two time series variables having unit root or not. Table III has shown the results of Augmented Dickey Fuller Test regarding stationarity of both the variables. The findings of the study have suggest that the two variables of present study follow an I(1) process which means that the time series variables are co-integrated at order one and both these become stationary at first order difference.

**Table II Results of ADF Unit Root Test**

<i>ADF</i>	<i>At Level</i>		<i>At First Difference (?)</i>	
	<i>t-statistic</i>	<i>probability</i>	<i>t-statistic</i>	<i>probability</i>
BSE Sensex	-0.253907	0.9276	-12.3648	0.0000
FPIs/FIIS	-1.054723	0.4731	-13.0943	0.0000

Now to study the linkage between Indian stock market and FIIs during the study period, Johansen test of co-integration was run at lag order 1(The lag order was decided after running lag length criteria). Table III has shown the results of Johansen test of co-integration. The results of Trace statistic and Max-Eigen statistic have shown similar evidences. These two tests are used to test the null hypothesis that that there is no co-integrating vector equation between the variables of the study.

**Table III Johansen Test of Co-integration**

<i>Unrestricted Co integration Rank Test (Trace)</i>				
<i>Hypothesized</i>	<i>Trace</i>	<i>0.05</i>		
<i>No. of CE(s)</i>	<i>Eigen value</i>	<i>Statistic</i>	<i>Critical Value</i>	<i>Prob.**</i>
None *	0.389981	130.1646	15.49471	0.0001
At most 1 *	0.288317	53.05923	3.841466	0.0000

*Unrestricted Co integration Rank Test (Maximum Eigen value)*

<i>Hypothesized</i>		<i>Max-Eigen</i>	<i>0.05</i>	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.389981	77.10534	14.26460	0.0000
At most 1 *	0.288317	53.05923	3.841466	0.0000

Trace test indicates 2 co integrating eqn(s) at the 0.05 level

Max-eigenvalue test indicates 2 co integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Both Trace and Max-Eigen statistics have rejected the null hypothesis and indicates that both BSE Sensex and FPIs/FIIs have long run association and despite current drift in the movement of these two time series, both the time series will move in the same direction in future. Hence the trend of stock market is identifiable and can be traced with the movement of net flow of capital by FPIs/FIIs.

The Johansen test of co-integration has given the evidences of long run linkage or association between Indian stock market performance and net flow of FPIs/FIIs. In order to obtain advance results on this association the present study has applied restricted VAR or Vector Error Correction Model (VECM). Table IV has shown the normalized coefficients of VECM. The significance of t-coefficient indicates that the independent variable has significant impact on the dependent variables therefore there are strong evidences of long run causality running from FPIs/FIIs (which is independent variable in the present study) towards BSE Sensex return series (which is dependent variable in the present study). Table IV has shown the results of VECM. The notes given at the end of Table IV are also important to be observed.

**Table IV Results of Vector Error Correction Model Normalized Co-integrating Coefficients**

<i>BSE Sensex (-1)</i>	<i>FPIs/FIIs (-1)</i>	<i>C</i>
1.00	-0.008167 (0.00087) [-9.42335]	-0.020339

The values given in parenthesis ( ) are the standard errors and t-coefficients are given in [ ].

Coefficient of Error Correction terms = (-0.480385, p-value 0.0000)

R<sup>2</sup> = 0.3625, F = 38.81, DW = 2.063

A VECM model to be good fit must have a negative and significant coefficient of error correction or coefficient of co-integrating equation. It should have a negative sign and significant p-value. The error correction coefficient obtained in the present Vector Error Correction Model has also been identified having negative sign (-0.480385) with zero as its p-value indicating that there is long run association between two variables in the study and there is significant long run impact of independent variable on dependent variable. After obtaining the evidences in favor of long run linkage between Indian stock market performances through VECM it is important to test the power of model. First of all the coefficient of R-square was examined and it was found that 36.25% variation in dependent variable, i.e., BSE Sensex, is explained by independent variable, i.e., net inflows of FPIs/FIIs. The co-efficient of R-square is quite less than an acceptable level of 60%. But F-statistic is found significant which is good for the model. After this it was important to diagnose the trend of residuals of VECM. The residuals of above mentioned equation were also diagnosed to examine the goodness of fit of the model. The evidences obtained through

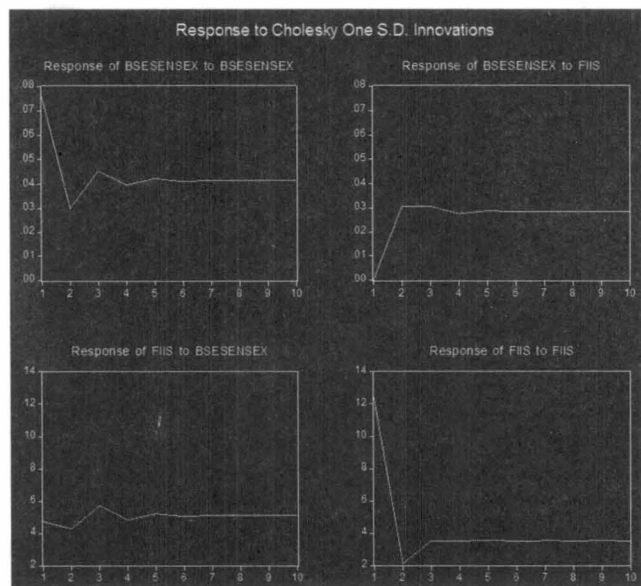
various residual diagnostic tests have showed that the the OLS regression equation obtained through system equation of VECM fits in the criteria of a good model.

A VECM also help to examine short run linkage between the variables of the study. The results discussed above have given evidences in favor of long run causality running from FPIs/FIIS towards Indian stock market performance. Through Wald Test, the significant F-statistic (16.8912) and Chi-square coefficient (33.78384) with zero probability have given evidences in favor of short run linkage too. In addition to this, Granger test of causality have further evidenced in favor of significant impact of FPIs/FIIS on Indian stock market although the reverse of this is not identified. It shows that the stock market performance does not cause movement in FPIs/FIIS flows in Indian stock market.

Table V Results of Granger Test for Causality

Null Hypothesis:	F-Statistic	Probability
FPIs/FIIS does not Granger Cause BSE Sensex	8.49217	0.00410
BSE Sensex does not Granger Cause FPIs/FIIS	0.18587	0.66698

In order to get more robust results regarding movement of Indian stock market as a result of movement in the flow of FPIs/FIIS, the present study has obtained evidences through Impulse Response Function (IRF). The Cholesky's criterion has been used to identify the impact of one standard deviation shock on stock index return series in India. The results of the same are given in the picture below. As shown in the following picture, it takes approximately two days to BSE Sensex index to reach to a stable position and with small instability in next two days it reaches to a state of equilibrium (after four days). And when a shock of one standard deviation in return series of BSE Sensex index is given then it takes around three days for FPIs/FIIS to reach to an equilibrium level.



## Conclusion

The results of Johansen test of co-integration indicates that the FPIs/FIIS and BSE Sensex index share long run information and have shown co-movements. The VECM also indicates that there

is positive association between Indian Stock market performance and FPIs/FIIs movement meaning thereby that with the inflows of capital by FPIs/FIIs in Indian stock market the performance of market benchmark also improves in terms of returns and with the withdrawal of capital by foreign institutional investors results in downfall in the return series of market benchmark. The results justify the theoretical explanation of relationship between Stock Market Performance and FPIs/FIIs movement. The findings of impulse response function supports that the Indian stock market is very sensitive towards the flow of FPIs/FIIs in stock market. In such a market condition, the regulators must ensure that there is less volatility in the market with the movement of FIIs cash flows. Further research can be done to examine the volatility pattern in Indian stock market due to movement of FIIs and a model with dummy variable can also be introduced to examine the difference in level of co-integration due to financial crisis 2008.

## References

- Agarwal, R. N. (1997), "Foreign Portfolio Investment in Some Developing Countries: A study of Determinants and Macroeconomic Impact, *Indian Economic Review*, Vol. XXXII, No. 2, pp.217-229.
- Badhani, K N (2006), "Dynamic Relationship among Stock Prices, Exchange Rate and Net FII Investment Flow in India", *Prajnan*, 35(3), 231-248.
- Batra, Amita (2003), "The Dynamics of Foreign Portfolio Inflows and Equity Returns in India", Seventh Annual Capital market Conference, UTI Institute of Capital Markets, Mumbai, December 18-19, 2003.
- Bohn, H., Tesar, L.L., 1996. US equity investment in foreign markets: Portfolio rebalancing or return chasing? *American Economic Review* 86 (2), 77–81.
- Brennan, Michael J. and H. Henry Cao. (1997). "International Portfolio Investment Flows", *Journal of Finance*, Vol. LII, No. 5, December
- Calvo, Guillermo and Enrique G Mendoza, (2000), "Rational Contagion and the Globalisation of Securities Markets", *Journal of International economics*, Vol # 51.
- Chakrabarti, R (2001), "FII Flows to India: Nature and Causes", *Money and Finance*, Oct-Dec, Vol.2, Issue 7
- Cho, Y.J. (1986). Inefficiencies from Financial Liberalization in the Absence of Well-Functioning Equity Markets. *Journal of Money, Credit and Banking*, 18(2):191-99. <http://EconPapers.repec.org/RePEc:mcb:jmoncb:v:18:y:1986:i:2:p:191-99>
- Errunza, Vihang. (2001). "Foreign Portfolio Equity Investments, Financial Liberalization and Economic Development", *Review of International Economics*, Vol. 9, Issue 4, Special Issue: International Financial Liberalization, Capital Flows and Exchange Rate Regimes.
- Fitz Gerald, (2003), "Policy Issues in Market Based and Non Market Based Measures to Control the Volatility of Portfolio Investment", *Finance and Development Research Programme, Working Paper Series Paper No. 8*, Oxford University
- Gordon, J. and P. Gupta. (2003). "Portfolio Flows into India: Do Domestic Fundamentals Matter?" *IMF Working Paper No. 03/20*, January, International Monetary Fund, Washington DC.
- Kumar .R and Pankaj Vashisht P. (2009). The global economic crisis: impact on India and policy responses, Online] Available: <http://www.adbi.org/files/2009.11.12.wp164.global.economic.crisis.india.pdf>.
- Kumar, SSS (2006), "Role of Institutional Investors in Indian Stock Market", *Impact*, July-December, pp.76-80.
- Markets", *Journal of Finance*, *American Finance Association* 55 (2): 565–613.
- Mukherjee, Parmita and Bose, Suchismita and Coondoo, Dipankar (2002), "Foreign Institutional Investment in the Indian Equity Market: An Analysis of Daily Flows during January 1999 to May 2002", *Money and Finance ICRA Bulletin*, April –September, pp. 54-83.
- Srikanth Maram and Kishore Braj (2012), "Net FII Flows into India: A Cause and Effect Study", *ASCI Journal of Management*, 41(2), pp.107-120.
- Stanley Morgan (2002): "FII's influence on Stock Market", *Journal of impact of Institutional Investors on ism*. Vol 17. Emerald Group Publishing Limited.
- Tesar, L.L. & Werner, I.M. (1995). "Home Bias and High Turnover", *Journal of International Money & Finance*. Vol.14, No.4, pp. 467-492.
- Verma, Radheshyam, and Anand Prakash. 2011. "Sensitivity of Capital Flows to Interest Rate Differentials: An Empirical Assessment for India." *RBI Working Paper Series: 7/2011*, Dept. of Economic and Policy Research (DEPR), May.