RELATIONSHIP BETWEEN INDIAN CAPITAL MARKET AND FOREIGN INSTITUTIONAL INVESTMENT

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ABSTRACT

This paper examines the relationship between Indian capital markets and foreign institutional investment. The information on this relationship is quite useful and caters to the interest of policy makers and investors especially focusing on the behavioral study during phases of change in the market. The study is based on secondary data covering sample of 12 years spanning from January 2001 to October 2012. VAR approach and Granger Causality tests have been utilized for processing the given data set. The study found a positive correlation between FII's and Sensex in all the phases of market and strong relationship between the Sensex and FIIs during the technology crisis in Indian economy.

Keywords: *FIIs, Stock return, BSE Sensex, Foreign Investment, and Granger Causality.*

1. Introduction

Emerging economies like India are focusing on investment from external financing agencies or say inflow of foreign capital to create foreign exchange reserve in the nation, to meet their trade deficit and for the development of the economy via international trade. As every coin always has the two sides likewise foreign capital inflow brings economical threats as well as opportunities in the country. On one hand, due to the entry of foreign capital, domestic industries may face stiff competition from MNC's. On the other hand, an inflow of foreign capital will lead to enhancement of the skills, knowledge and technology of Indian industries. FDI and FIIs are main source of attracting the foreign investment in a nation. FII's includes overseas pension funds, mutual funds, investment trusts, asset Management Companies, Nominee Companies, banks, institutional portfolio managers, university funds, endowments, foundations, charitable trusts, charitable societies etc. The term FII is used most commonly in India to refer outside companies investing in the financial markets of India. After 1991 Economic reforms, which leads to liberalization of Indian economy in world market, In September, 1992 FIIs were allowed to invest in Indian stock market. Since then, India has witnessed a significant rise in capital Inflows. The variation in the cost of capital is also one of the important factors resulting in attracting foreign capital in India.

During the year FY2002-2003, Net FIIs investment in Indian stock market had been decreased from 82.73 to 26.69 billion rupees. This was the time when world market was facing IT crisis. After an impressive performance for nearly five years, foreign capital inflows lost their momentum in the second half of 2008. The most significant change was observed in the

case of FIIs, which saw a strong reversal of flows. Against a net inflow of 625.84 rupees billion in FY2007–2008, there was a net outflow of -433.38 rupees billion from Indian markets during FY2008–2009 as foreign portfolio investors sought safety and mobilized resources to strengthen the balance sheet of their parent companies. This massive outflow of FII's created panic in the Indian stock markets. Consequently, equity markets lost more than 60% of their index value.

Therefore the flow of foreign institutional investment and its relationship with stock returns has been of immense interest to investors and policy makers alike. Generally the flow of foreign institutional investment has been highly correlated with the market returns and the study of markets behavior becomes utmost important especially at the time of phases of upward and downward movement of the returns. The present study has been done with focus on phases of change in Indian stock market.

2. Review of Literature

A large number of studies have been conducted to explore the cause and effect relationship between FIIs and market indices of Indian stock market. These studies present the mixed findings. Rao, Murthy and Rangnathan (1999), conducted a study of developed market by taking the data for a period of 8 years (1990 to 1998). They suggest that FIIs investments would help the stock markets directly through widening investor base and indirectly compelling local authorities to improve the trading system. In their study they analyzed the investment exposure of the five US-based India specific funds that suggested a close resemblance between FII investment and trading pattern at the BSE. On behalf of that they interpreted that net FII investment influences stock prices in India as it traces the relationship to the sectoral level. They found that heavy emphasis of FIIs was on computer software and consumer goods industry. The other finding was that the FIIs are having a strong presence in the Indian Mutual Funds segment. Chakrabarti (2002) examined the nature and causes of FII flows to India. The study has found FII inflows were highly correlated with equity returns in India and argued that FII flows are effects of returns rather than the cause of it. The study also argued that, FIIs do not seem to have informational disadvantage compared to local investors. It was found that Asian crisis resulted in a regime shift and since then domestic equity returns became the single most important determinant of FII flows to India.

Panda (2005) tried to examine the impact of FIIs Investments on the Indian stock market by applying VAR analysis on the daily data from October 2003 to March 2004 and found Mutual Fund investments having better explanatory power than FIIs investments in explaining returns on both of the main Indian markets BSE and NSE Nifty. The investigation found that FIIs investments did not affect BSE Sensex rather it was affected by the later.

Babu and Prabheesh (2008) examined the causal relationship between foreign institutional investment and stock returns. The study has found bi directional causality between FIIs investment and stock returns. FIIs investment flows were more stock return driven.

Bansal and Pasricha (2009) studied the impact of market opening to FIIs, on Indian stock market behavior. India announced its policy regarding the opening of stock market to FIIs for investment in equity and related instruments on 14th September 1992. Using stock market data related to Bombay Stock Exchange, for both before and after the FIIs policy announcement day, they conducted an empirical examination to assess the impact of the market opening on the returns and volatility of stock return. they found that while there is no significant changes in the Indian stock market average returns, volatility is significantly reduced after India unlocked its stock market to foreign investors. Goudarzi and Ramanarayanan (2011) investigated the cointegration and causality between the Indian stock market and foreign institutional investment (FII) In India during world financial turmoil of 2008. Found that BSE500 stock index and FII series are cointegrated and causality between them is bilateral.

Gupta (2011) examined the relationship between Indian stock market and FIIs investment in India and found that both, Indian stock market and FIIs influence each other; however, their timing of influence is different. Mamta, Priyanka and Mathur(2012) made an attempt to understand the behavioral pattern of FII during the period of 2001 to 2010 and Also examined correlation between FII and BSE sensex by the Karl Pearson' Coefficient of correlation test. They found that sensex has increased when there are positive inflows of FIIs and there were decrease in sensex when there were negative FII inflows. The Pearson correlation values indicated positive correlation between the foreign institutional investments and the movement of sensex. Sultana and Pardhasaradhi (2012) made an attempt to study the relationship and impact of FDI & FII on Indian stock market using statistical measures correlation coefficient and multi regression. Based on 11 years data starting from 2001 to 2011, they found that Flow of FDIs and FIIs in India determines the trend of Indian stock market.

3. Data and Research Methodology

3.1 Data:

Time span of the study is from January 2001 to October 2012.The study period has been divided into three phases as per the global event and market trends. The first phase covers period from January 2001 to December 2003 during which global economy faced the IT crisis and result into explosion of the bubble of the internet and technology value. During this phase share price of the IT companies came to their lowest level. The second phase from January 2004 to December 2007 characterize by the revival of stock market and positive flow of foreign capital in emerging economies, commonly known as the bull run period. In the third phase from January 2008 to October 2012 economies went through financial crisis. Recession raised the eyebrows of all the eminent economists and finance professionals of world economy.

The present study is based on secondary data. FIIs net investment in Equity and closing price of sensex of Bombay Stock Exchange has been taken in this study. BSE is the oldest stock exchange of India and barometer of Indian economy. FIIs data and stock prices data has been taken from the websites of SEBI and BSE stock exchange respectively.

3.2 Method of Analysis:

First of all, the following formula is used to calculate the daily stock returns for the above mentioned stock index.

$$R_t = [\log(P_t) - \log(P_{t-1})]*100$$

Where P_t is the price of stock index on date t, P_{t-1} is the price of the stock index on day t-1 and R_t is the daily return on day t.

To analyze the relationship between foreign institutional investments (FIIs) and stock returns the study applied VAR approach and Granger Causality test.

3.2.1 Unit Root Tests

Studies which are based on time series data assume that time series is stationary that implies mean and variance are constant over the time. Stationary condition has been tested using Augmented Dicky Fuller (ADF) and Phillips- Perron tests.

Augmented Dickey–Fuller (ADF) Test: Augmented Dickey-Fuller (ADF) test has been carried out which is the modified version of Dickey-Fuller (DF) test. ADF makes a parametric correction in the original DF test for higher-order correlation by assuming that the series follows an AR (p) process. The ADF approach controls for higher-order correlation by adding lagged difference terms of the dependent variable to the right-hand side of the regression. The Augmented Dickey-Fuller test specification used here is as follows:

$$\Delta Y_t = b_0 + \beta Y_{t-1} + \mu_t \Delta Y_{t-2} + \ldots\ldots + \mu_p \Delta Y_{t-p} + e_t$$

Yt represents time series to be tested, b_0 is the intercept term, β is the coefficient of interest in the unit root test, μ_i is the parameter of the augmented lagged first difference of Y_t to represent the p^{th} order autoregressive process, and e_t is the white noise error term.

Phillips-Perron (PP) Test: Phillips and Perron(1988) use non-parametric statistical methods to take care of the serial correlation in the error terms without adding lagged difference terms. The test regression for the Phillips-Perron (PP) test is the AR (1) process:

$$\Delta Y_t = b_0 + \beta Y_{t-1} + e_t$$

3.2.2 Granger Causality Test

According to the concept of Granger's causality test (1969, 1988), a time series x_t Granger-causes another time series y_t if series y_t can be predicted with better accuracy by using past values of x_t rather than by not doing so, other information is being identical. If it can be shown, usually through a series of F-tests and considering AIC on lagged values of x_t (and with lagged values of y_t also known), that those x_t values provide statistically significant information about future values of y_t time series then x_t is said to Granger-cause y_t i.e. x_t can be used to forecast y_t. The pre-condition for applying Granger Causality test is to ascertain the stationarity of the variables in the pair. Engle and Granger (1987) show that if two non-stationary variables are co-integrated, a vector auto-regression in the first differences is unspecified. If the variables are co-integrated, an error-correcting model must be constructed. In the present case, the variables are not co-integrated; therefore, Bivariate Granger causality test is applied at the first difference of the variables. The second requirement for the Granger Causality test is to find out the appropriate lag length for each pair of variables. For this purpose, we used the vector auto regression (VAR) lag order selection method available in Eviews. This technique uses six criteria namely log likelihood value (log L), sequential modified likelihood ratio (LR) test statistic, final prediction error (F & E), AKaike information criterion (AIC), Schwarz information criterion (SC) and Hannan–Quin information criterion (HQ) for choosing the optimal lag length. Among these six criteria, all except the LR statistics are monotonically minimizing functions of lag length and the choice of optimum lag length is at the minimum of the respective function.

Since the time series of FII is stationary or I(0) from the ADF and PP tests, the Granger

Causality test is performed as follows:

$$\Delta S_t = \alpha_1 + \beta_{11}\Delta S_{t-1} + \beta_1 n \Delta S_{t-n} + \gamma_{11} F_{t-2} + \ldots. + \gamma_1 n F_{t-n} + \varepsilon_{1,t}$$

$$Ft = \alpha_2 + \beta_{21} F_{t-1} + \beta_{22} F_{t-2} + \ldots \beta_2 n F_{t-n} + \gamma_{21}\Delta S_{t-2} + \ldots + \gamma_2 n \Delta S_{t-n} + \varepsilon_{2,t}$$

Where n is a suitably chosen positive integer; $\beta_j\ \gamma_j, j = 0,1\ldots$ are parameters and $\alpha' s$ are

constant; and u_t's are disturbance terms with zero means and finite variances.

(ΔS_t is the first difference at time t of Sensex where the series is non-stationary.)

3.2.3 Variance Decomposition

The vector auto-regression (VAR) of Sims (1980) has been estimated to capture short run causality between Sensex and FII investment. VAR is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. In VAR modeling the value of a variable is expressed as a linear function of the past, or lagged, values of that variable and all other variables included in the model. Thus all variables are regarded as endogenous. Variance decomposition offers a method for examining VAR system dynamics. It gives the proportion of the movements in the dependent variables that are due to their 'own' shocks, versus shocks to the other variables. A

shock to the ith variable will of course directly affect that variable, but it will also be transmitted to all of the other variables in the system through the dynamic structure of the VAR [Chris Brooks (2002)]. Variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR and provides information about the relative importance of each random innovation in affecting the variables in the VAR.

3.2.4 Impulse Response Function

Since the individual coefficients in the estimated VAR models are often difficult to interpret, the practitioners of this technique often estimate the so-called impulse response function (IRF). The IRF traces out the response of the dependent variable in the VAR system to shocks in the error terms. So, for each variable from each equation separately, a unit shock is applied to the error, and the effects upon the VAR system over time are noted. Thus, if there are m variables in a system, total of m2 impulse responses could be generated. In our study there are four impulse responses possible for each phase, In econometric literature, both impulse response functions and variance decomposition together are known as innovation accounting (Enders, 1995).

4. Empirical Findings

4.1 Testing of Normality

The normality test has been conducted by using Jarque–Bera statistics for FIIs and Sensex. The results are shown in Table 1 & 2 along with the descriptive statistics. Table shows that value of skewness and kurtosis is different from 1 and 3 in all the phases of FIIs and Sensex which indicate frequency distribution is either leptokurtic or platykurtic. Result is further supported by Jarque–Bera statistics where Null hypothesis of normality is rejected as the value of probability is less than .05 in all cases except in the phase two of Sensex.

4.2 Testing of Stationarity

Simple way to check for the stationary is plot the time series graph and observe the trend in mean, variance and autocorrelation. If these are constant over time then time series is said to be stationary. Sensex has a clear upward slope(Figure 1) and vertical fluctuation is not same at different time indicating that Sensex time series is non stationary whereas in case of FIIs mean and variance are seems to be constant(Figure 2) which indicate the presence of stationary in the time series of FIIs. Econometrics tests have also been used to check actual nature of time series. On the basis of the ADF and PP test statistics (Table 3&4) it can be said that Sensex is stationary at first difference but non stationary at level in all the phases. In case of FIIs, it is stationary at the level itself in all the cases except first phase at 5% level of significance.

4.3 Testing of Correlation

Correlation test has been conducted between FIIs and Sensex for each phase because this test is considered as the first indication of interdependency among the time series. The correlation coefficient are shown in table 5 which presents that correlation coefficient between FIIs and Sensex is highest in bear phase of stock market (third phase) and lowest in the bull phase(second phase). This might be due to increased participation of others players in the bull phase when equity price shows the increasing trends.

4.4 Testing of Bilateral Causal Relationship

The correlation need to be further verified for the direction of influence by the Granger causality test. Results are shown in table 6. From table it can be inferred that null hypothesis Sensex does not granger cause FIIs, is rejected only in case of first phase otherwise accepted in second and third phase. It means during the IT crisis Sensex shows the frequent downward trend which cause the FIIs activity increase in the Indian stock market that support the outcome sensex cause FIIs. The null hypothesis of FIIs does not granger cause Sensex is accepted in all the phases which shows that activities of FIIs not have any influence on Indian stock market during upward and downward market.

4.5 Results of VAR

Variance decomposition determines how much of the n step ahead forecast error variance of a given variable is explained by innovations to each explanatory variable. Generally it is observed that own series shocks explain most of the forecast error variance of the series in a VAR. Table 7 shows the result of Variance decomposition of FII and Sensex at 2, 5 and 10 variance periods. In case of Bivariate modeling of Sensex and FII for Phase 1, FII explains nearly 86% of its own forecast error variance while Sensex explains only 27% of FII variance; but Sensex explains approx 72% of its own forecast error variance while FII explains only 14% of Sensex variance, this indicates that Sensex defines FII more than FII defines Sensex which conclude to the result that Sensex causes FII in short run. This result is same in each phase. It indicates that FII don't hesitate to pull out their money from Indian market whenever market faces downward trend.

Impulse response graphs shows that in the first phase response of FIIs to one standard deviation shock to sensex is severe and significant as compare to response of sensex to FIIs. The picture is different in the second phase where the response of FIIs to one standard deviation shock to sensex is weak and short lived. Response of sensex to FIIs presents the same picture. It means there is a weak correlation between Sensex and FIIs during the bull phase of market. In the third phase Response of Sensex to one standard deviation shock to FIIs is very sharp and significant whereas FIIs response to Sensex is not significant and dies before the ten lags.

5. Conclusion and Policy Recommendations

This paper empirically investigates the relationship between stock market and FIIs in Indian economy. First the normality test was applied and found that both Sensex and FIIs time

series are not normally distributed. Unit root test shows that Sensex time series is not stationary at level but the FII series is stationary at level itself. The present study found that sensex is positively correlated to FIIs. During the bear phase (IT Crises and Financial crisis) correlation between the FIIs and Sensex was high but it was low during the bull phase might be due to the participation of other players in the market. Bi-variate Granger Causality Test shows that sensex caused the FIIs during the first phase, means Sensex had a great bearing on the activity of the FIIs whereas the reverse causality doesn't hold true but second and third phase indicated that there is no causal relationship between FIIs and Sensex. It was found that Sensex explained more variance of FIIs than by the FIIs in all the phases. FIIs respond to Sensex severely during the first phase and Sensex respond FIIs significantly during the third phase. .Therefore it can be concluded that Sensex and FIIs shows strong relationship whenever Indian economy faces crisis but the situation is opposite in bull phase of market.

Policy measure must be taken by Regulator and Policymaker of Government of India to strengthen our economy from the bad news, fluctuations and crisis of foreign countries. Indian economy should provide sound infrastructure, stable economic environment and effective regulatory mechanism to attract FIIs. Deficit risk, which affects the countries Global rating, may be reduced by FIIs

References

Bansal. A., & Pasricha, J.S. (2009). Foreign institutional investor's impact on stock prices in India. *Journal of Academic Research in Economics, 1*(2).

Chakrabarti, R. (2002). FII flows to India: Nature and Causes. *Money and Finance, 2*(7).

Goudarzi, H., & Ramanarayanan, C.S. (2011). Empirical Analysis of the Impact of Foreign Institutional Investment on the Indian Stock Market Volatility during World Financial Crisis 2008-09. *International Journal of Economics and Finance, 3*(3), 214-226.

Gupta (2011). Does the Stock Market Rise or Fall Due to FIIs in India. *Journal of Arts, Science & Commerce, 2*(2), 99-107.

Kumar, S. (2001). Does the Indian Stock Market Play to the tune of FII Investments? An Empirical Investigation. *ICFAI Journal of Applied Finance, 7*(3), 36-44.

Mamta, Priyanka & Mathur (2012). Impact of Foreign Institutional Investment On Stock Market With Special Reference to BSE: A Study of Last One Decade. *Asian Journal of Research in Banking and Finance, 2*(4), 31-47.

Panda, C. (2005). An Empirical Analysis of the Impact of FIIs Investment on Indian Stock Market. *Applied Finance*, 53-61.

Rao, K.S., Murthy, M.R. & Ranaganathan, K.V.K. (1999), Foreign Institutional Investment and the Indian Stock Market. *Journal of Indian School of Political Economy, 11*(4), 623-647.

Sultana, S.T., & Pardhasaradhi, S. (2012). Impact of Flow of FDI & FII on Indian Stock Market. *Finance Research, 1*(3), 4-10.

Babu, S.M., & Prabheesh, K.P. (2008). Causal relationships between Foreign Institutional Investments and stock returns in India. *International Journal of Trade and Global Markets, 1*(3), 259–265.

Table 1: FII Descriptive Statistics

Time Period	Phase 1 (Jan 2000 to Dec 2003)	Phase (Jan 2004 to 2 Dec 2007)	Phase 3 (Jan 2008 to Oct 2012)
Mean	1092.28	4045.3	4391.11
Median	476.35	3999.2	1899.85
Maximum	6797.5	23872.4	28562.9
Minimum	-1417.8	-7770.5	-15347.3
Std. Dev.	1656.24	6041.6	9834.67
Skewness	1.58	0.85	0.4
Kurtosis	5.79	5.1	2.77
Jarque-Bera	35.52*	14.67*	1.65*
Probability	0.00	0.00	0.04
Results	Not Normal	Not Normal	Not Normal

Table 2: Sensex Descriptive Statistics

Time Period	Phase 1 (Jan 2000 to Dec 2003)	Phase (Jan 2004 to 2 Dec 2007)	Phase 3 (Jan 2008 to Oct 2012)
Mean	3794	10153.75	16242.72
Median	3540.74	9658.91	17214.86
Maximum	5838.96	20286.99	20509.09
Minimum	2811.6	4759.62	8891.61
Std. Dev.	752.23	4311.62	2894.96
Skewness	0.88	0.63	-1.25
Kurtosis	2.85	2.47	3.86
Jarque-Bera	6.22*	3.7	16.87*
Probability	0.04	0.16	0.00
Results	Not Normal	Normal	Not Normal

Table 3: Unit root test of Sensex

Sensex	ADF Test Statistics		PP Test Statistics	
Time period	Level	First Difference	Level	First Difference
Phase 1 (Jan2000 to Dec 2003)	-0.60617	-5.491877	-0.96956	-5.713947
Phase 2 (Jan2004 to Dec 2007)	1.648207	-6.451823	2.22032	-6.451823
Phase 3 (Jan2008 to Oct 2012)	-1.5279	-7.356843	-1.70424	-7.35587

Note: * indicates significant at 5% level

Table 4 : Unit root test of FII

FII	ADF Test Statistics		PP Test Statistics	
Time period	Level	First Difference	Level	First Difference
Phase 1 (Jan. 2000 to Dec. 2003)	-1.075292	-11.75843	-2.96459	-12.76008
Phase 2 (Jan. 2004 to Dec. 2007)	-8.10836	-11.03589	-8.13288	-12.01574
Phase 3 (Jan. 2008 to Oct. 2012)	-4.571946	-8.485612	-4.62879	-15.05266

Note: * indicates significant at 5% level

Table 5: Correlation Matrix between FII and Sensex

Phase 1		Phase 2		Phase3	
FII	SENSEX	FII	SENSEX	FII	SENSEX
1	0.56702	1	0.55828	1	0.60846
0.56702	1	0.55828	1	0.60846	1

Table 6: Summary of Granger Causality Test

	Phase 1		Phase 2		Phase 3	
Null Hypothesis	**F Statistics**	**Probability**	**F Statistics**	**Probability**	**F Statistics**	**Probability**
Sensex does not Granger Cause FII	4.05818*	0.02466	1.1883	0.31501	0.87769	0.35301
FII does not Granger Cause DAILY	0.23386	0.79252	0.75166	0.47797	0.01191	0.91352
Lags	2		2		1	

Note: 1. *indicates significant at 5% level
2. Number of lags is determined by AIC criteria. Lag values differ because of the different number of observations in each phase.

Table 7 : Summary of Variance Decomposition

		Phase 1		Phase 2		Phase 3	
Variance Decomposition	**Variance Period**	**FII**	**SENSEX**	**FII**	**SENSEX**	**FII**	**SENSEX**
FII	2	99.15	0.85	95.63	4.37	98.8	1.2
	5	86.39	13.61	95.41	4.59	98.51	1.49
	10	85.08	14.92	95.41	4.59	98.51	1.49
SENSEX	2	26.02	73.98	30.89	69.11	38.91	61.09
	5	27.38	72.62	30.89	69.11	38.92	61.08
	10	27.84	72.16	30.89	69.11	38.92	61.08

Figure 1: Sensex time series

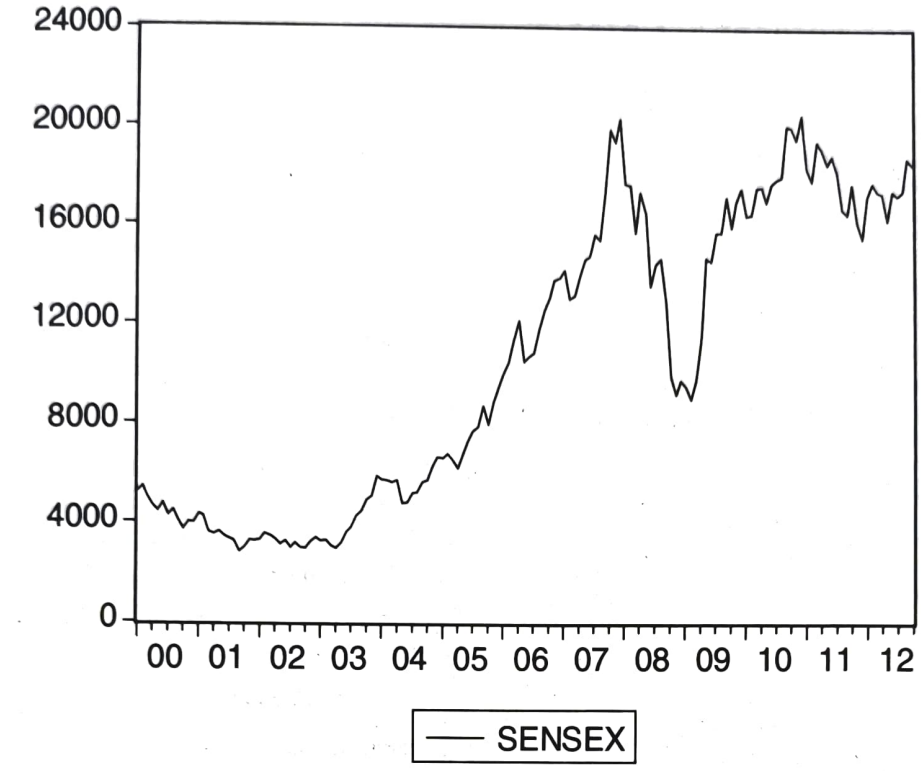

Figure 2: FII time series