"Impact of Foreign Investments on Indian Equity Market"

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***Abstract*: - This research paper studied the impact of foreign investments on Indian equity market. For achieving such objective, the monthly data have been collected for BSE Sensex, NSE nifty and Foreign Equity Investments during year 2005 to 2016. For data analysis and interpretation, various statistical tools have been used such as Augmented Dickey Fuller (ADF) Test, Granger Causality Test, Johansen Co-integration Test and Vector Error Correction Model. To conclude, foreign investments do not cause the movement of Indian equity market but the reverse present. Further, there is no long run causality from Indian equity market to foreign investments.**

***Keywords*: BSE Sensex, Foreign Institutional Investments, NSE Nifty, Granger Causality test, Vector Error Correction Model**

I. INTRODUCTION

Stock Market (also called Stock Exchange or Share Market) is one important constituent of capital market. Stock Market is an organized market for the purchase and sale of industrial and financial security. It is convenient place where trading in securities is conducted in systematic manner i.e. as per certain rules and regulations.

A. Stock Market - India

There are two leading stock exchanges in India as below:

- Bombay Stock Exchange (BSE)
- National Stock Exchange (NSE)

Bombay Stock Exchange: Established in 1875, BSE Ltd. (formerly known as Bombay Stock Exchange Ltd.), is Asia's first Stock Exchange and one of India's leading exchange groups. Over the past 137 years, BSE has facilitated the growth of the Indian corporate sector by providing it an efficient capital-raising platform. Popularly known as BSE, the bourse was established as "The Native Share & Stock Brokers' Association" in 1875. BSE's popular equity index - the S&P BSE SENSEX - is India's most widely tracked stock market benchmark index. It is traded internationally on the EUREX as well as leading exchanges of the BRCS nations (Brazil, Russia, China and South Africa).

National Stock Exchange: The National Stock Exchange (NSE) is India's leading stock exchange covering various cities and towns across the country. NSE was set up by leading institutions to provide a modern, fully automated screen-based trading system with national reach. The Exchange has brought about unparalleled transparency, speed & efficiency, safety and market integrity. It has set up facilities that serve as a model for the securities industry in terms of systems, practices and procedures. NSE has played a catalytic role in reforming the Indian securities market in terms of microstructure, market practices and trading volumes. The market today uses state-of-art information technology to provide an efficient and transparent trading, clearing and settlement mechanism.

Foreign Institutional Investments: Foreign Institutional Investor (FII) means an institution established or incorporated outside India which proposes to make investment in securities in India. They are registered as FIIs in accordance with Section 2 (f) of the SEBI (FII) Regulations 1995. FIIs are allowed to subscribe to new securities or trade in already issued securities. This is just one form of foreign investments in India.

A SEBI registered FII (as per Schedules 2 of Foreign Exchange Management (Transfer or Issue of Security by a Person Resident Outside India) Regulations 2000) can invest/trade through a registered broker in the capital of Indian Companies on recognised Indian Stock Exchanges. FIIs can purchase shares / convertible debentures either through private placement or through offer for sale. An FII can also invest in India on behalf of a sub-account (means any person outside India on whose behalf investments are proposed to be made in India by a FII) which is registered as a sub-account under Section 2 (k) of the SEBI (FII) Regulations, 1995. Also, an FII can issue off-shore derivative instruments (ODIs) to persons who are regulated by an appropriate foreign regulatory authority and after compliance with Know Your Client (KYC) norms.

B. Literature Review

- Badhani (2005) applied Granger Causality Test on the monthly data from April 1993 to March 2004 and observed in the contemporary Indian scenario (i) bi-directional long-term causality between FII investment flows and stock prices, but no short-term causality could be traced between the variables; (ii) no long-term relationship between exchange rate and stock prices, but short-term causality runs from change in exchange rate to stock returns, and (iii)

exchange rate long term Granger causes FII investment flow, not vice versa.

- Bhattacharya and Mukherjee (2006) investigate the nature of the causal relationship of FIIs with stock return and exchange rate in India by applying co integration and long term Granger Causality test and find a bi-directional causality between stock return and FIIs investments. But no causal relationship between exchange rates and net investments by FIIs investments is found.
- Tripathy (2007) examines the inter linkage among stock market, market capitalization and net FII investments by applying both Ganger Causality and Vector Auto Regression test (VAR). The results indicate that there is no significantly causality between FII investment and market capitalization but there is an unidirectional casual relationship between market capitalization and stock market and net FII investment and stock market.
- Kumar (2007) also found a causal relationship between foreign institutional investors and stock market returns by applying granger causality test and found that the movements in Indian stock market can be explained with the help of foreign institutional investors' direction as they have positive correlation with stock returns in India.
- Mishra (2009) has made an attempt to study the impact of FII on Indian capital market performance by using the monthly data on sensex based stock returns and net FII over a period of 17 years spanning from Jan 1993 to May 2009 and found that the movements in FII and Indian capital market are both positively correlated and explained fairly.
- 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.
- Dr. Mamta Jain, Ms. Priyanka Laxmi Meena, Dr. T. N. Mathur (2012) examined the contribution of foreign institutional investment in sensitivity index (Sensex) and examine the volatility of BSE Sensex due to FII. Foreign institutional investors have gained a significant role in Indian stock markets. The dawn of 21st century has shown the real dynamism of stock market and the various benchmarking of sensitivity index (Sensex) in terms of its highest peaks and sudden falls.

C. Research Methodology

Research Statement: "Impact of Foreign Investments on Indian Equity Market"

Research Questions: For a given research statement, there are likely to be several research questions as below:

- Is there any significant impact of Foreign Institutional Investments on BSE Sensex?
- Is there any significant impact of Foreign Institutional Investments on NSE Nifty?
- Is there any significant impact of BSE Sensex on Foreign Institutional Investments?
- Is there any significant impact of NSE Nifty on Foreign Institutional Investments?

Research Objectives:

- To study the impact of foreign investments on Indian equity market.
- To study the long run causality between the variables.
- To study whether foreign investments cause BSE Sensex and NSE Nifty or BSE Sensex and NSE Nifty cause foreign investments.

Constructs Defined: The important constructs for this study are BSE Sensex, NSE Nifty and Foreign Investments.

Research Design: To study the cause and effect relationship between foreign institutional investments and NSE Nifty, the Causal Research Design is used. The descriptive research design is also used.

Data Collection Method: Secondary Data have been collected from official websites of Bombay stock exchange, National Stock Exchange, journals, magazines, books etc.

Sample: In order to fulfil the objectives of this study BSE Sensex, Foreign Institutional Investments and NSE Nifty have been considered.

Sample Period: Monthly data of BSE Sensex, Foreign Institutional Investments and NSE Nifty have been collected during January- 2005 to June-2016.

Statistical Tools: Statistical tools used in this study are Augmented Dickey Fuller (ADF) Test, VAR Lag Order Selection Criteria, Granger Causality Test, Johansen Co-integration Test and Vector Error Correction Model by using Eviews7 and Microsoft Excel.

Limitations of the Study:

- This study is purely based on the secondary data collection method. So the limitations of secondary data cannot be neglected in this case.

- This study is limited to selected time period from year 2005 to year 2016.
- In this study, only FII equity investments and sales are considered.

D. Data Analysis & Interpretation

Unit Root Test: A test of stationarity (or non stationarity) that has become widely popular over the past several years is the unit root test. The most popular method of stationarity is ADF test. The result of ADF test for this study is shown below:

Table I ADF Test for BSE Sensex, NSE Nifty and FIIs

H0: δ=0 (unit root)	**p value**		
	BSE Sensex	NSE Nifty	FIIs
At Level – I(0)	0.3361	0.2495	0.0000
At First Difference – I(1)	0.0000	0.0000	-

Interpretation: The above table I depicts that at level I(0), the ADF test for BSE Sensex and NSE Nifty is statistically not significant at 5% level of significance as the p value is 0.3361 and 0.2495 respectively which is more than 0.05. So the null hypothesis cannot be rejected at level I(0). This means that BSE Sensex and NSE Nifty series have unit root problem and they are considered as non stationary series. Therefore, it is checked at first difference level I(1). At first difference level, the ADF test is statistically significant at 5% level of significance as the p value for both series is 0.0000 which is less than 0.05. So the null hypothesis can be rejected at level I(1). This mean that BSE Sensex and NSE Nifty series are considered as stationary series at first difference level i.e. at I(1).

Similarly, at level I(0), the ADF test for FIIs is statistically significant at 5% level of significance as the p value is 0.0000 which is less than 0.05. So the null hypothesis can be rejected at level I(0). This mean that FIIs series is considered as stationary series at level zero i.e. at I(0). So, there is no need to check it at first difference level.

VAR Lag Order Selection Criteria: Before applying Granger causality test, it is necessary to find appropriate lag length for each pair of variables. For that, VAR lag order selection method is used as below:

Table II VAR Lag Order Selection Criteria

Lag	**AIC**	**SC**
0	54.36346	54.43169
1	49.56339	49.83632
2	49.51414*	49.99177*
* indicates lag order selected by the criterion		

Interpretation: This technique uses criteria like Akaike information criterion (AIC) and Schwarz information Criterion (SC) for choosing optimal lag length. From the above table the optimum lag length is 2 according to AIC and SC methods.

Granger Causality Test: The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. The result of Granger Causality Test is as below:

Table III Pair Wise Granger Causality Test for FIIs, BSE Sensex and NSE Nifty

Null Hypothesis	**F-Statistic**	**p-value**
DBSE Sensex does not Granger Cause DFIIS	5.63318	0.0191
DFIIS does not Granger Cause DBSE Sensex	0.63574	0.4267
DNSE Nifty does not Granger Cause DFIIS	5.63318	0.0005
DFIIS does not Granger Cause DNSE Nifty	0.63574	0.0862

Interpretation: From the above Tale III it can be said that the null hypothesis i.e. DBSE Sensex does not granger cause FIIS and DNSE Nifty does not granger cause FIIS are significant at 5% level of significance since the p value of both null hypothesis is 0.0191 and 0.0005 which is less than 0.05. It means that the first null hypothesis can be rejected. Thus it can be said that there is statistical evidence that the movement of Indian equity market causes foreign investors to invest in Indian equity market.

Further, the null hypothesis i.e. FIIS does not granger cause DBSE Sensex and DNSE Nifty is not significant at 5% level of significance since the p value of both null hypothesis is 0.4267 and 0.0862 which is more than 0.05. Thus it can be said that there is no statistical evidence that the movement of foreign investors do not cause the movement of Indian equity market.

Johansen Co-integration Test: If two or more series are individually integrated (in the time series sense) then the series are said to be co-integrated. The Unrestricted Co-integration Rank Test (Trace) and the Unrestricted Co-integration Rank Test (Maximum Eigen Value) are used to check the co-integration between all variables. The result of this test is as below:

Table IV Unrestricted Co-integration Rank Test

Hypothesized No. Of CE(s)	Trace p value	Max-Eigen p value
None*	0.0000	0.0009

At most 1*	0.0025	0.0035
At most 2	0.1238	0.1238

Interpretation: The above table IV provides the Unrestricted Co-integration Rank Test. Trace and Max-Eigen test statistics are used to interpret whether null hypothesis can be rejected at 5% level or cannot be rejected. As per both test statistics, null hypothesis can be rejected for all co-integrating variables since their p values are 0.0000 and 0.0009 which are less than 5% and hence it is significant. It implies that there is one co-integrating variable exists which confirm co-integration between the variables.

Vector Error Correction Model (VECM): The Vector Error Correction Model is used only when if the variables are co-integrated with each other. According to Johansen Co-integration test used in this study, it has been confirmed that all variables of this study are co-integrated with each other.

As per Granger causality test, it is found that the movement of BSE Sensex and NSE Nifty causes FIIs for the investments whereas the investments by FIIs do not causes the movement of BSE Sensex and NSE Nifty. Therefore, in this case BSE Sensex and NSE Nifty are taken as independent variables and FIIs as dependent variable.

Table V Vector Error Correction Model for BSE Sensex, NSE Nifty and FIIs

Vector Error Correction Estimates Dependent Variable: FIIS Included Observations: 135 after adjustments Lag Intervals: 1 2 Standard errors in ( ) & t-statistics in [ ]				
Co-integrating Eq:	**CointEq1**			
FIIS(-1)	1.000000		R-squared	0.346013
BSE Sensex(-1)	-0.178662		Adjusted R-squared	0.320683
	(0.17067)		F-statistics	13.65137
	[-1.04682]		Prob (F-statistics)	0.000000
C	-1847.170			
	Co-efficient	**Std. Error**	**t-Statistics**	**Probability**
C(1)	-0.473335	0.136711	-3.462304	0.056
Co-integrating Eq:	**CointEq1**			
FIIS(-1)	1.000000		R-squared	0.359541
NSE Nifty(-1)	-0.496074		Adjusted R-squared	0.334717
	(0.56571)		F-statistics	14.48361
	[-0.87690]		Prob (F-statistics)	0.000000
C	-2387.402			
	Co-efficient	**Std. Error**	**t-Statistics**	**Probability**
C(1)	-0.401986	0.142723	-2.816747	0.052

Interpretation: The above table V exhibits the outcome of vector error correction model. In this case the coefficients are negative (-0.47 and -0.40) but their corresponding p values are 0.056 and 0.052 respectively which are higher than 0.05. Therefore, the coefficients are not significant at 5% level of significance. It means the null hypothesis i.e. there is no long run causality from BSE Sensex and NSE Nifty to FIIs cannot be rejected. Therefore, it can be said that there is no long run causality running from BSE Sensex and NSE Nifty to FIIs. F value and R squared value are calculated to check whether this model is fitted well or not. F values are 13.65 and 14.48 and their corresponding p values are 0 which is less than 0.05. Therefore, F statistics is significant at 5% level of significance. R squared values are 0.35 and 0.36 which are comparatively less but they are positive. Thus, it can be said that this model is overall significance as F statistics is significant at 5% level of significance.

II. CONCLUSIONS

It can be concluded from the data analysis that there is causality from BSE Sensex and NSE Nifty to Foreign Institutional Investments and there is no reverse causation present on it. There is no direct relationship that foreign investments cause the movement of BSE Sensex and NSE Nifty, but a direct relationship could be established that the movement in BSE Sensex and NSE Nifty cause foreign investors to invest or disinvest in or from Indian equity market. It can be concluded from the VECM model that there is no long run causality running from BSE Sensex and NSE Nifty to FIIs. It can also be concluded from the R squared value that only 36% variation in foreign investments is explained by Indian equity market, it means that there can be other factors also which play their roles to affect foreign investments in Indian stock market.

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