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RELATIONSHIP BETWEEN FII & SENSEX (JANUARY 2007-DECEMBER 2009)**DR. JIMMY KAPADIA**

ASST. PROFESSOR

S. R LUTHRA INSTITUTE OF MANAGEMENT

SURAT – 395 007

MS. POOJA PATEL

LECTURER

S. R LUTHRA INSTITUTE OF MANAGEMENT

SURAT – 395 007

MR. BHAVIK PANCHOLI

STUDENT

S. R LUTHRA INSTITUTE OF MANAGEMENT

SURAT – 395 007

ABSTRACT

Globalization had led to widespread liberalization and implementation of financial market reforms in many countries, mainly focusing on integrating the financial markets with the global markets. Capital Market has also undergone metamorphic reforms in the past few years, which has led to an increase in the foreign portfolio investments flowing to the Indian markets. A significant part of these portfolio flows to India comes in the form of Foreign Institutional Investors' (FIIs') investments, mostly in equities.

In this paper, an attempt has been made to determine the relationship between FII flows and the SENSEX returns in India with a closer look at the issue of causality. The coefficient correlation is used to establish the relationship between FII and SENSEX from January 2007 to December 2009. Then Correllogram and Unit root test are applied to find out, whether the given time series is stationery or not. Lastly a cause and effect relationship is established between FII and SENSEX returns by using granger causality test.

Thus the study ends with a conclusion which allows the readers to understand the cause and effect relationship between FII and BSE. It will be beneficial for the foreign and Indian investors in decision making with regards to investment in India. It can also help the policy makers to understand the importance of FII and to improve the policy and procedures for FII Coming to India.

KEYWORDS

Foreign Institutional Investors, SENSEX, Granger Causality test.

INTRODUCTION

Globalization had led to widespread liberalization and implementation of financial market reforms in many countries, mainly focusing on integrating the financial markets with the global markets. Indian Capital Market has also undergone metamorphic reforms in the past few years. Every segment of Indian Capital Market viz primary and secondary markets, derivatives, institutional investment and market intermediation has experienced impact of these changes which has significantly improved the transparency, efficiency and integration of Indian market with the global markets.

This is one of the prime reasons why the foreign portfolio investments have been increasingly flowing into the Indian markets. A significant part of these portfolio flows to India comes in the form of Foreign Institutional Investors' (FIIs') investments, mostly in equities. Ever since the opening of the Indian equity markets to foreigners, FII net investments have steadily grown.

The growth of the equity market in India has been phenomenal in the present decade. Right from early nineties, the stock market witnessed heightened activity in terms of various bull and bear runs. SENSEX has captured all these happenings in the most judicious manner. One can identify the booms and busts of the Indian equity market through SENSEX. As the oldest index in the country, it provides the time series data over a fairly long period of time (from 1979 onwards). Small wonder, the SENSEX has become one of the most prominent brands in the country. Rise and fall of the markets is part of normal economic activity in any market. But 'crash' of the markets is quite different from routine 'fall'. Recession and capital markets have some cause and effect relationship and it may be extremely difficult to establish as to which one of the two is responsible for the other. In fact, both the economic phenomena supplement each other.

But more than that is the factor of human psychology that is responsible for the crash. As per economic theory, the economic systems grow with cyclical fluctuations when every recession is followed by recovery and up-swing of the economy, to be again backed by the recessionary tendencies. The only thing not known is the time of the switch. All investors love the ideal situation and pray for the bullish trends in the markets. But the collective attitude of the society undergoes change during the bullish times and people wishfully hope that the markets would continue growing for all times to come.

The investments are made with this attitude and hope. But the bearish trends are inevitable at such a stage, as the economic cycle has to take full turn. Several economic factors play a major role in determining the timing of the downward trend to begin.

➤ **Liquidity position in the economy**

- Effective demand
- Interest rates
- Money supply
- Inflation rate and
- Overall global economic situation

The rest of the paper is organized as follows: Section 2 presents the snapshot on FII and its trend in India, Section 3 discusses the data and methodology being employed. Section 4 summarizes the findings and interprets the results. Section 5 concludes.

INCREASING TREND OF FII IN INDIA

FII is used to denote an investor - mostly of the form of an institution or entity, which invests money in the financial markets of a country different from the one where in the institution or entity was originally incorporated. FII investment is frequently referred to as hot money for the reason that it can leave the country at the same speed at which it comes in. SEBI have prescribed norms to register FIIs and also to regulate such investments flowing in through FIIs.

FIIs are more than just money. These investments are non-debt creating flows, also a reason why Indian policy makers sought to liberalize such flows in the wake of the BOP crisis. Theoretically, FII investments bring in global liquidity into the equity markets and raise the price-earning ratio and thereby reduce the cost of capital domestically. FII inflows help supplement domestic savings and smoothen inter-temporal consumption.

Studies indicate a positive relationship between portfolio flows and the growth performance of an economy, though such specific studies for India were not found. India, in the recent past few years seems to have received a disproportionately large part of its foreign investment flows via the FII investments in the equity markets.

The large build-up of foreign exchange reserves through FII inflows poses a potential threat of destabilization of the economy. Portfolio flows are most often referred to as "hot money" that can be notoriously volatile when compared to other forms of capital flows. The Mexican crisis and the East Asian crisis are classic examples of the damage that sudden outflows of portfolio money can do to an economy.

Without immediately implicating any significant withdrawal of funds out of India of crisis precipitating proportions, it needs to be noted that outflows of FII capital from the market could adversely impact the value of the Indian currency, as FII inflows form the most significant part of foreign inflows into the economy.

There is likely to be a break in the growth momentum of the Indian economy if FII inflows significantly slow down. This is because a large extent of buoyancy in consumption was possible due to the positive wealth effects of a booming stock market and a decline in the interest rates due to a large overhang of rupee liquidity in the system (also a by-product of large FII inflows over the last few years).

Therefore, if FII inflows were to slow down, it will reduce the wealth generated by the stock market, the Indian currency will depreciate and RBI will have to draw down on the foreign exchange reserves or hike interest rates to prevent wild swings in the exchange rate. But, certainly foreign institutional investors have gained a significant role in Indian capital markets. Availability of foreign capital depends on many firm specific factors other than economic development of the country.

Foreign portfolio inflows through FIIs, in India, are important from the policy perspective, especially when the country has emerged as one of the most attractive investment destinations in Asia.

With the emerging market crises of the late 1990s, the role of Foreign Portfolio Investment (FPI) and the major players therein i.e. the foreign institutional investors (FIIs) has come under intense scrutiny by academics as well as policymakers.

OBJECTIVE OF STUDY

To determine the relationship between FII returns and Sensex returns from the year 2007 to 2009.

To find out, whether the given time series of FII and Sensex returns is stationary or not

To establish a Cause and effect relationship between FII and Sensex returns and conclude whether FII causes Sensex returns or viceversa.

METHODOLOGY

To find out the relationship between FII and Sensex returns, Coefficient correlation is used.

In order to determine whether the time series is stationary or not, Correlogram and Unit root test is applied.

Granger causality test is used to prove cause and effect relationship between FII returns and Sensex..

BENEFIT OF THE STUDY

This study will be beneficial to the foreign and Indian investors in decision making with regards to investment in India.

DATA COLLECTION TOOLS

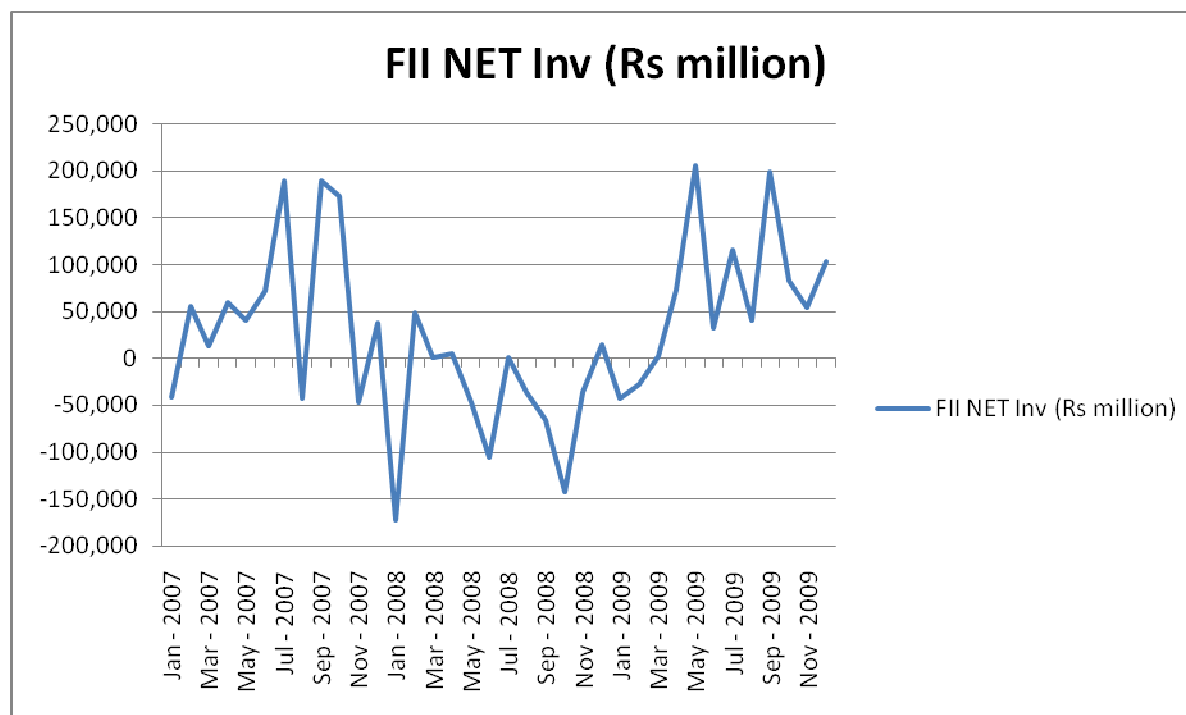
Secondary data collection methods have been used in the research through sources such as internet, journals, and newspapers have been referred. Various Statistical tools have been used for analysis like MINITAB 15, GRETL, E VIEW, and Microsoft EXCEL 2007 for the study.

In order to achieve all the above mentioned objectives, month end data of FII and SENSEX have been used from 01/01/2007 to 31/12/2009, which are further converted into % returns for better analyses, so the total number of observations are 36, The above time period was considered because Indian stock markets witnessed an unprecedented rise in trading volumes during this time span because of very high volatility which resulted into stock market crash all around the world.

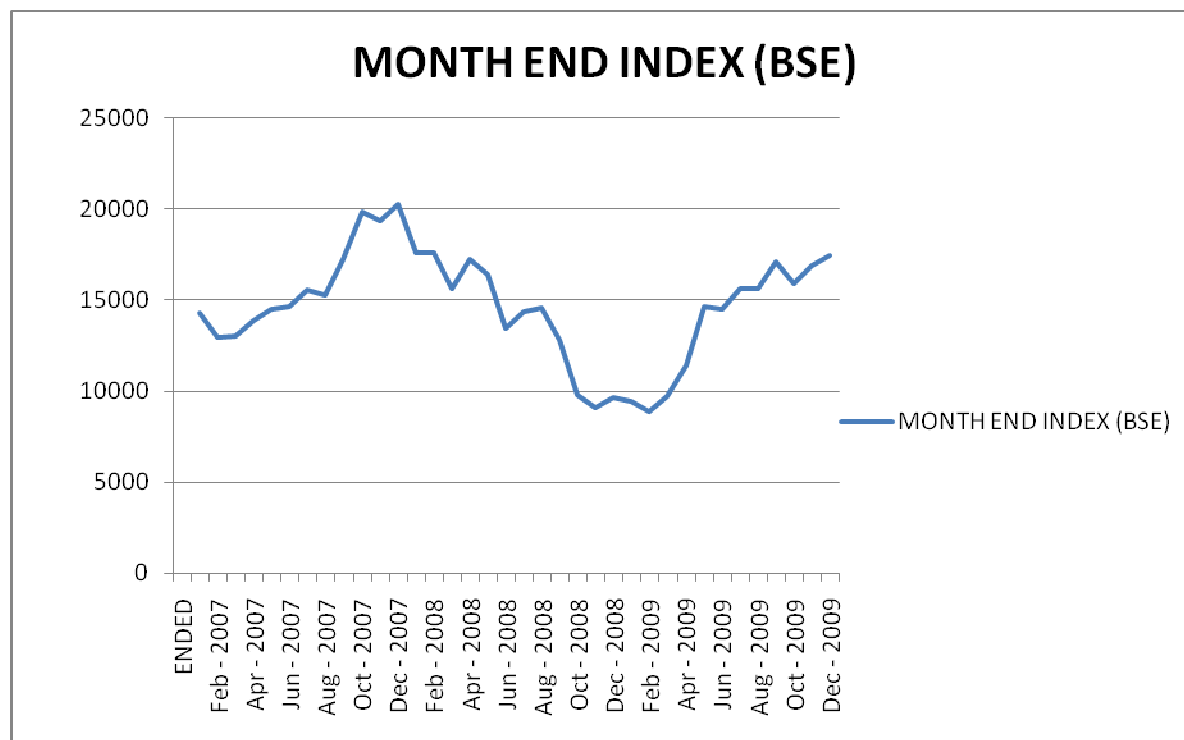
FII flows, measured in terms of the net investment by foreign institutional investors in Rupees million, available from the monthly bulletin of Securities and Exchange Board of India (SEBI) and BSE closing index returns from the Bombay Stock Exchange of India (BSE) have been used for the analysis.

ANALYSIS & FINDINGS

Month	FII (RS in Mn)	% change	Month end BSE Index	% Change
Jan - 2007	-41,761		14,283	
Feb - 2007	55,954	1.746	12,938	-0.104
Mar - 2007	14,033	-2.987	13,072	0.010
Apr - 2007	59,987	0.766	13,872	0.058
May - 2007	40,968	-0.464	14,544	0.046
Jun - 2007	71,694	0.429	14,651	0.007
Jul - 2007	189,953	0.623	15,551	0.058
Aug - 2007	-41,913	5.532	15,319	-0.015
Sep - 2007	189,485	1.221	17,291	0.114
Oct - 2007	173,631	-0.091	19,838	0.128
Nov - 2007	-45,974	4.777	19,363	-0.025
Dec - 2007	37,558	2.224	20,287	0.046
Jan - 2008	-172,269	1.218	17,649	-0.149
Feb - 2008	48,827	4.528	17,579	-0.004
Mar - 2008	1,244	-38.250	15,644	-0.124
Apr - 2008	5,080	0.755	17,287	0.095
May - 2008	-46,722	1.109	16,416	-0.053
Jun - 2008	-105,777	0.558	13,462	-0.219
Jul - 2008	1,758	61.169	14,356	0.062
Aug - 2008	-35,979	1.049	14,565	0.014
Sep - 2008	-65,996	0.455	12,860	-0.133
Oct - 2008	-142,486	0.537	9,788	-0.314
Nov - 2008	-35,037	-3.067	9,093	-0.076
Dec - 2008	14,260	3.457	9,647	0.057
Jan - 2009	-42,502	1.336	9,424	-0.024
Feb - 2009	-26,905	-0.580	8,892	-0.060
Mar - 2009	2,690	11.002	9,709	0.084
Apr - 2009	73,842	0.964	11,403	0.149
May - 2009	206,069	0.642	14,625	0.220
Jun - 2009	32,249	-5.390	14,494	-0.009
Jul - 2009	116,253	0.723	15,670	0.075
Aug - 2009	40,287	-1.886	15,667	0.000
Sep - 2009	199,395	0.798	17,127	0.085
Oct - 2009	83,042	-1.401	15,896	-0.077
Nov - 2009	54,692	-0.518	16,926	0.061
Dec - 2009	103,514	0.472	17,465	0.031



(Chart 1)



(Chart 2)

From the above 2 charts, it can be analysed that Net inv of FII was highest in the month July 07 i.e. Rs 189953 (million), the effect of same is also seen in BSE returns and as a result, BSE for that month has almost increase to above 900 basis point compared to June 07. BSE closing for December 07 was around 20287 basis point compare to 15319 in August 2007, therefore an increase of 5000 basis point in just 5 months was a result of positive FII net investment for the period.

In 2008, global recession poses crash to the market by 10000 basis point till the end of the year. As a result the year was also marked with outflows of more FII in 7 out of 12 months and resulted in the adverse condition in the stock market

Recovery was seen in the market in 2009 and as a result market was stabilized and gain almost above 8000 basis point due to positive inflow of investment by FII in the market.

Major corrections were found in the month of May 2009, where markets almost gained above 3000 basis points as the net investment by FII was up to Rs 206069 million for that month. 10 out of 12 months had the positive inflows of FII which overall resulted into bullish sentiments in the stock market.

COEFFICIENT CORRELATION

Here the Coefficient of correlation between % change IN NET FII INVESTMENT and % change in BSE RETURN measures the degree of relationship between the two. The reliability of estimates depends upon the closeness of the relationship.

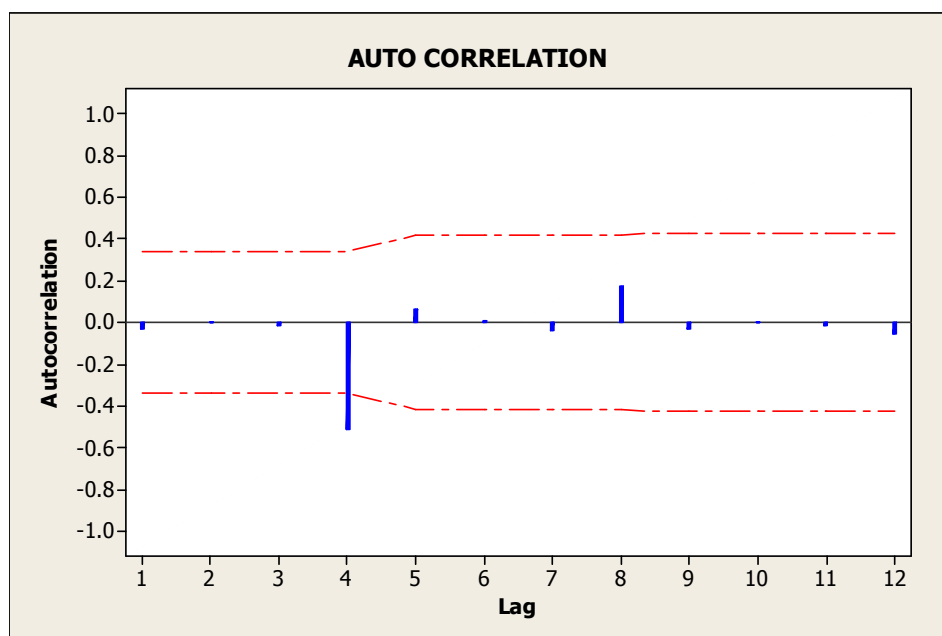
- ✓ **Null hypothesis H_0 is that % CHANGE in NET FII INVESTMENT has no effect on % change in BSE RETURN**
- ✓ **Alternative hypothesis H_1 is that % change in NET FII INVESTMENT has effect on % change in BSE RETURN**

Here Pearson correlation of % change IN NET FII INVESTMENT and % change in BSE RETURN (r) = **0.213**, so it can be concluded that there is a very low level of positive correlation between the two variables.

Also the calculated p-value is **0.212** which is more than tabulated (α value 0.05), therefore, the null hypothesis is accepted and it can be concluded that **% CHANGE IN NET FII INVESTMENT has no in BSE RETURN effect on % change**

AUTO CORRELATION: FII % CHANGE IN NET INVESTMENT FOR THE YEAR 2007 TO 2009

LAGS	ACF1
1	-0.032586
2	-0.003740
3	-0.016129
4	-0.514941
5	0.063674
6	0.005071
7	-0.038144
8	0.175672
9	-0.032378
10	0.003403
11	-0.012613
12	-0.054524



(Chart 3 from Minitab 15)

Table 1 from Minitab 15)

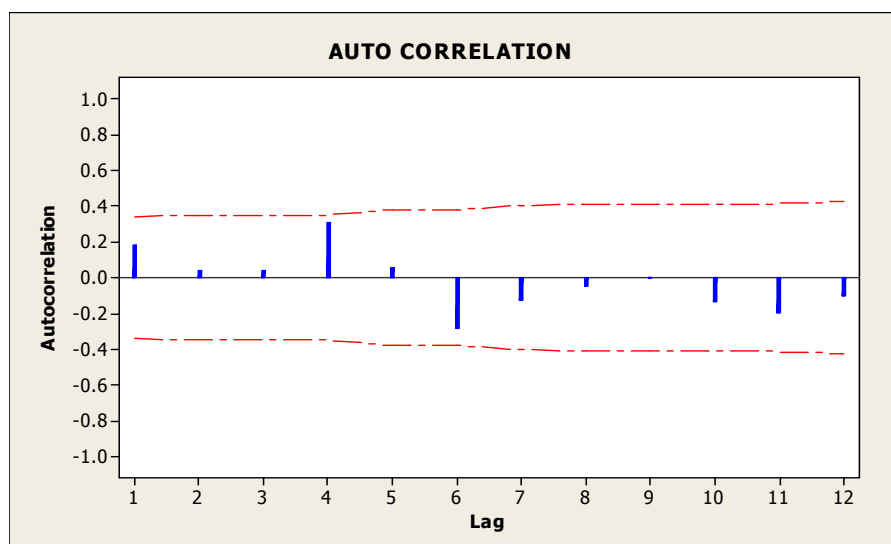
From the above diagram, it is observed that the autocorrelation values at various lags hover around zero, which shows, that the FII time series from the year 2007 to 2009 is stationery time series.

However the ACF value at 4th lag is quite high compared to the others which suggests a significant impact at that lag interval.

AUTOCORRELATION: BSE CLOSING INDEX % RETURN FOR THE YEAR 2007 TO 2009

LAGS	ACF2
1	0.183829
2	0.041783
3	0.037692
4	0.307551
5	0.054654
6	-0.283563
7	-0.122692
8	-0.049581
9	-0.000200
10	-0.135215

11	-0.198565
12	-0.099647



(Chart 4 from Minitab 15)

(Table 2 from Minitab 15)

From the above diagram, it is seen that the autocorrelation values of BSE % returns at various lags hover around zero, therefore it can be concluded that the given time series of BSE returns is Stationery.

AUGMENTED DICKEY-FULLER

Augmented Dickey-Fuller test for % CHANGE IN NET FII INVESTMENT including 3 lags of (1-L)

Sample size 32

Unit-root null hypothesis: $a = 1$

1) Test with constant

Model: $(1-L)y = b_0 + (a-1)y(-1) + \dots + e$

1st-order autocorrelation coefficient for e: -0.015

Lagged differences: $F(3, 27) = 3.323 [0.0346]$

Estimated value of $(a - 1)$: -1.60631

Test statistic: $\tau_c(1) = -4.72904^1$

Since the t value of 4.72904 in absolute terms is more than even the 5% critical t value of -2.93, suggesting that after taking care of possible autocorrelation in the error term, the FII series is stationary.

2) With constant and trend

Augmented Dickey-Fuller test for FII net invest including 3 lags of (1-L) FII net invest

Sample size 32

Unit-root null hypothesis: $a = 1$

¹ > 5% table value of 2.93 as per dickey fuller table: series is stationery

Model: $(1-L)y = b_0 + b_1t + (a-1)y(-1) + \dots + e$

1st-order autocorrelation coefficient for e: 0.015

Lagged differences: $F(3, 26) = 3.197 [0.0399]$

Estimated value of $(a-1)$: -1.60691

Test statistic: $\tau_{ct}(1) = -4.63766^2$

Since the t value of FII -4.63766, in absolute terms is more than the 5% critical r value of -3.50, suggesting that after taking care of possible autocorrelation in the error term, the FII series is stationary.

Augmented Dickey-Fuller test for % CHANGE IN BSE RETURN including 3 lags of (1-L) Sample size 32

Unit-root null hypothesis: $a = 1$

1) Test with constant

Model: $(1-L)y = b_0 + (a-1)y(-1) + \dots + e$

1st-order autocorrelation coefficient for e: 0.026

Lagged differences: $F(3, 27) = 1.004 [0.4061]$

Estimated value of $(a-1)$: -0.507616

Test statistic: $\tau_{ct}(1) = -1.68371^3$

The t value of FII is -1.68371, but this value in absolute terms is much less than even the 5% critical r value of -2.93, again suggesting that even after taking care of possible autocorrelation in the error term, the BSE series is non stationary.

2) With constant and trend

Augmented Dickey-Fuller test for % CHANGE IN BSE RETURN including 3 lags of (1-L)

Sample size 32

Unit-root null hypothesis: $a = 1$

Model: $(1-L)y = b_0 + b_1t + (a-1)y(-1) + \dots + e$

1st-order autocorrelation coefficient for e: -0.023

Lagged differences: $F(3, 26) = 0.962 [0.4254]$

Estimated value of $(a-1)$: -0.516373

Test statistic: $\tau_{ct}(1) = -1.68026^4$

5% value with trend and constant is -3.50 as per table

The t value of FII is -1.26906, but this value in absolute terms is much less than even the 5% critical r value of -3.50, again suggesting that even after taking care of possible autocorrelation in the error term, the BSE series is non stationary.

GRANGER CAUSALITY TEST

Causal relationships between Foreign Institutional Investments and stock returns in India

Here the causal relationship between FII flows (X) i.e. % change in month end net investment and BSE closing index (Y) i.e. % change in month end returns influenced by the rise of stock market, whether the rise in BSE index is attracting FII flows via higher returns or are they driven by the FII flows.

RESULTS OF GRANGER CAUSALITY TEST

Lags: 1			
Null Hypothesis:	Observations	F-Statistic	Probability
% CHANGE IN NET FII INVESTMENT does not Granger Cause % CHANGE IN BSE RETURN	35	0.35585 ⁵	0.55502
% CHANGE IN BSE RETURN does not Granger Cause % CHANGE IN NET FII INVESTMENT		3.21738 ⁶	0.08232

The results suggest that the direction of causality is from BSE to FII since the calculated value of F is 3.21738 which is quite high than the estimated value of F at the 5% level, the critical value is 1.36. On the other hand there is no reverse causation from FII to BSE since the F value is statistically insignificant.

Therefore it can be concluded that % change in BSE returns Granger causes % change in FII returns, as there is a unidirectional causality between them.

² > 5% table value of 3.5 as per dickey fuller table: series is stationery

³ < 5% table value of 2.93 as per dickey fuller table: series is non stationery

⁴ < 5% table value of 3.50 as per dickey fuller table: series is non stationery

⁵ < 5% critical F value of 1.36: accept the hypothesis

⁶ > 5% critical F value of 1.36: reject the hypothesis

Lags: 2			
Null Hypothesis:	Observations	F-Statistic	Probability
% CHANGE IN NET FII INVESTMENT does not Granger Cause % CHANGE IN BSE RETURN	34	0.28337⁷	0.7553
% CHANGE IN BSE RETURN does not Granger Cause % CHANGE IN NET FII INVESTMENT		1.72944⁸	0.19518

The result suggests that the direction of causality is from BSE returns to FII net investment since the estimated F is significant at 0.25 percent level because the critical F value is 1.44 which is less than calculated value of 1.72944.

On the other hand there is no reverse causation from FII net investment to BSE returns, since the F value is statistically insignificant. So again it can be concluded that % change in BSE returns Granger causes % change in FII returns, as there is a unidirectional causality between them.

Lags: 3			
Null Hypothesis:	Observations	F-Statistic	Probability
% CHANGE IN NET FII INVESTMENT does not Granger Cause % CHANGE IN BSE RETURN	33	0.7896⁹	0.51068
% change in BSE return does not Granger Cause % change in FII returns		1.24406¹⁰	0.31399

The result suggests that there is independence in direction of causality from BSE returns to FII net investment since the estimated F is significant at 0.05 percent level because the critical F value is 1.42 which is more than 1.24406.

On the other hand there is no causation from FII net investment to BSE returns, since the F value is statistically insignificant.

Thus the direction of causality may depend critically on the number of lagged terms used in finding the results.

Lags: 4			
Null Hypothesis:	Observations	F-Statistic	Probability
% CHANGE IN NET FII INVESTMENT does not Granger Cause % CHANGE IN BSE RETURN	32	0.58825¹¹	0.67443
% CHANGE IN BSE RETURN does not Granger Cause % CHANGE IN NET FII INVESTMENT		2.83161¹²	0.04796

The result suggests that the direction of causality is from BSE returns to FII net investment since the estimated F is significant at 0.25 percent level because the critical F value is 1.40 which is less than 2.83161.

On the other hand there is no reverse causation from FII net investment to BSE returns, since the F value is statistically insignificant.

FINDINGS

The key findings of this study can be summarized as:

The coefficient correlation between % CHANGE IN NET FII INVESTMENT and % CHANGE IN SENSEX RETURN in India shows a very low level positive correlation of 0.213

The Correlogram of FII and BSE both shows a stationery time series, since their AUTO CORRELATION starts at very low value and hover around zero. This means that the given time series hovers around zero which suggests that the time series is stationery.

The ADF test of FII is found to be stationery according to 'test with constant' and 'test with constant and trend', since their T value is lower than the significant value and the trend of FII series is nearly common in last 36 months. The reason for FII being stationery is growth in FII over the years which have resulted into many booming sectors in India in which there's a lot of scope for FII.

The ADF test of BSE is found to be non stationery according to 'test with constant' and 'test with constant and trend' which explains that the mean and variance of BSE series in last 36 months is not same,

The pair wise Granger Causality test results proves that, % CHANGE IN BSE RETURN Granger cause % CHANGE IN NET FII INVESTMENT, as its F value AT different lags is quite high than its critical table value, therefore the hypothesis, % CHANGE IN BSE RETURN does not cause % CHANGE IN NET FII INVESTMENT is rejected.

⁷ < 0.25% critical F value of 1.44: accept the hypothesis

⁸ > 0.25% critical F value of 1.44: reject the hypothesis

⁹ < 5% critical F value of 1.42: accept the hypothesis

¹⁰ < 5% critical F value of 1.42: accept the hypothesis

¹¹ < 0.25% critical F value of 1.40: accept the hypothesis

¹² > 0.25% critical F value of 1.40: reject the hypothesis

FII will always be beneficial for the ultimate growth of India which eventually depends upon the sectoral growth, therefore more liberal policies should be made to encourage FII in the uncover sectors of country.

CONCLUSIONS

Institutional investors are a permanent feature of the financial landscape, and their growth will continue at a similar and perhaps faster pace. The factors that underpin their development are far from transitory and in many cases have only just started having an impact. The behavioural characteristics of institutional investors, therefore, will be an increasingly important determinant of domestic and international financial market conditions, and the implications for financial market stability warrant serious consideration"

In conclusion, the results reveal that the BSE % returns may be a leading indicator to predict the future FII flows. Although it may not be surprising to find that fluctuations in economic activity may be preceded by changes in stock prices, the finding that changes in BSE returns "Granger-caused" changes in FII net investment is important because it provides additional support for the leading economic role of the stock market.

The Study ends with a conclusion which allows the reader to understand the cause and effect relationship between FII and BSE which are considered being a barometer of growth in Indian stock market.

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