Institutional Investments and Indian Stock Market – A Causality Study

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Abstract:

Institutional investors are often said to destabilize stock markets, as their large size trades can move prices away from fundamental values, it is herding by institutions that are usually seen as destabilizing the market. There are several reasons why institutions might herd more than individuals. Institutions might try to gauge the quality of investments from each other's' trades, which leads to herding. And since institutions know more about each other's trades than do individuals, they tend to herd more.

The fund flows from both Domestic Institutional Investments (DIIs) and Foreign Institutional Investments (FIIs) have direct implications for the overall fund flows to the Indian stock market. Thus, activities of these two categories of investors are expected to play a significant role in broadening and deepening the Indian stock market.

Introduction:

The importance of institutional investors' particularly foreign investors is very much evident as one of the routine reasons offered by market analysts' whenever the market rises, it is attributed to foreign investors' money and no wonder we see headlines like "FIIs Fuel Rally" etc., in the business press. This is not unusual with India alone as today's most developed economies might have seen a similar trend in the past. Domestic institutional investors on the other hand being another important section of institutional investors are playing a vital role in the Indian stock market. These investors have emerged as important players in the Indian stock market and their activities are influencing the market. There are many instances where this section of investors has stabilized the market conditions on one hand whereas their moves took the market to destabilized position on the other hand.

Therefore, both FIIs and DIIs have become the most important determinants in the functioning of the Indian stock market. The present study aims at exploring the dynamic

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relationship between investment flows to the stock market from these two categories of institutional investors in the Indian economy and the stock market returns.

Objectives of the Study:

Main objective of the study is to explore the role of institutional investors' in the dynamism of Indian Stock market.

Further the objectives are divided as

1. To analyze the causality (both long run and short run) between foreign institutional investors' investments (FIIs) and Indian stock market,
2. To analyze the causality (both long run and short run) between domestic institutional investors' investments (DIIs) and Indian stock market, and
3. To analyze the relationship (both long run and short run) between investments of FIIs and DIIs.

Empirical Analysis:

The study is based on the monthly data of Advances to Decline Ratio (ADR) of two broad stock market indices of Indian stock market namely BSE and NSE and monthly Purchase to Sales Ratio (PSR) of FIIs' and DIIs' investments. The dataset covers the period from April 2007 to December 2013, a period of about 7 years comprising 81 observations.

Foreign Institutional Investors and Indian Stock Market:

This section of the study analyzed the co-integration and consequently disclosed both long run and short run causal relationship i.e., unilateral or bilateral between foreign institutional investors' investments and the Indian stock market.

The Normality is conducted for BSEADR, NSEADR and FIIPSR. The Jarque-Bera Statistics are used for this purpose. From the results obtained it is concluded that all the three variables understudy are normally distributed. The standard deviation indicates that the FIIPSR is relatively less volatile as compared to that of other two variables. The BSEADR and NSEADR are more or less having experienced similarity in volatility.

Stationarity test is conducted for BSEADR, NSEADR and FIIPSR. In case of all the variables, the time series mean and variance seems to be constant, which indicates the presence of stationarity in time series. Since in addition to visual inspection, econometric tests are also needed to decide the actual nature of time series, ADF, PP and KPSS tests are performed to check the stationarity of the time series.

The results of ADF and PP unit root tests performed to confirm the stationary properties of the time series data showed that the absolute value of calculated ADF test statistic and PP test statistic is greater than its critical value at both 1% and 5% level of significance in the time series of all the three variables understudy. It indicates that the integration of all the series is of order I (0) and there is no unit root.

Further in order to verify the results obtained by the ADF and PP unit root test Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test is applied. The results of KPSS test statistics for all the three variables understudy are less than the critical values at 1% and 5%. Therefore, the null hypothesis of stationary is not rejected. So, all three series in the study viz. BSEADR, NSEADR and FIIPSR are stationary and fulfilled the requirements for further research process.

Johansen co-integration test is applied to examine the bond between the three variables. The results of multivariate co-integrating vectors disclosed the rejection of null hypothesis of no co-integrating vectors under both the trace statistics and maximum Eigen value forms of test. The probabilities for different levels of number of co-integrated equations also confirmed the rejection of null hypothesis. Therefore it is concluded that there is a presence of even more than two co-integrated equations among the three variables understudy and which confirmed a long run equilibrium correlation between the variables.

As the Johansen Co-integration test revealed that there is co-integration among the variables understudy, Vector Error Correction Model (VECM) is applied in order to evaluate the short run properties of the co-integrated series. The structure lag is chosen on the basis of Vector Auto Regression (VAR) model using maximum criterion rule. To maintain consistency, the same lag length has been chosen as used for co-integration test.

In order to find out the long run and short run causality between the three variables viz. FIIPSR, BSEADR and NSEADR three models of VECM are applied.

- **Model I:** BSEADR as dependent variable and NSEADR and FIIPSR as independent variables.
- **Model II:** NSEADR as dependent variable and FIIPSR and BSEADR as independent variables.
- **Model III:** FIIPSR as dependent variable and BSEADR and NSEADR as independent variables.

The Vector Error Correction Model (VECM) revealed that there is a uni-directional causality running from foreign institutional investors' investment to Indian stock market in both long-run as well as in the short-run, which implies that the FII's are influencing the price changes in the Indian stock market, but they are not influenced by the later. Whereas, there is bi-directional causality running between BSE and NSE in long- run, but there is no short run causality between them.

Variance Decomposition Analysis is performed to gauge the comparative shock that one variable has upon another variable within the Vector Error Correction Model thereby, signifying the percentage of forecast error of a variable which is explained by another variable within short run dynamics and interactions. The results confirmed that both the variables under consideration, namely FII (85 per cent) and BSE (94 per cent) are said to be fairly exogenous variables. NSE is able to explain 56 to 47 percent of its own forecast error variance whereas, the remaining 44 to 53 percent is explained almost equally by both FII's investments and BSE, but FII's forecast increased significantly during the time horizon whereas, BSE has explained major percent of variance in the initial period, but its role declined as the time horizon increased.

Domestic Institutional Investors and Indian Stock Market:

This section of the study analyzed the co-integration and consequently disclosed both long run and short run causal relationship i.e., unilateral or bilateral between domestic institutional investors' investments and the Indian stock market.

Jarque-Bera Statistics are used to test the Normality of the variables i.e., DIIPSR, BSEADR and NSEADR. The null hypothesis of normality assumption could not be rejected and concluded that all the variables understudy are normally distributed. The standard deviation indicates that the DIIPSR is relatively less volatile as compared to that of other two variables and BSEADR is highly volatile among the three variables.

Stationary test is conducted for DIIPSR, BSEADR and NSEADR. The results of ADF and PP unit root tests performed indicated that the integration of all the series is of order I (0) and there is no unit root. Further results of KPSS test statistics for all the three variables understudy are less than the critical values at 1% and 5%. Therefore, the null hypothesis of stationary is not rejected. So, all three series in the study viz. DIIPSR, BSEADR and NSEADR are stationary and fulfilled the requirements for further research process.

Johansen co-integration test is conducted to verify the existence of co-integration between the variables understudy. The appropriate lag length of the model is determined by using Vector Auto Regression (VAR) model. Lag 1 is used as the appropriate lag for the conduct of the co-integration test and for running VECM.

The results of multivariate co-integrating vectors disclosed the rejection of null hypothesis of no co-integrating vectors under both the trace statistics and maximum Eigen value forms of test. The probabilities for different levels of number of co-integrated equations also confirmed the rejection of null hypothesis. Therefore it is inferred that there is a presence of even more than two co-integrated equations among the three variables understudy and which confirms a long run equilibrium correlation between the variables.

In order to find out the long run and short run causality between the three variables viz. DIIPSR, BSEADR and NSEADR three models of VECM are applied.

- **Model I:** DIIPSR as dependent variable and NSEADR and BSEADR as independent variables.
- **Model II:** BSEADR as dependent variable and NSEADR and DIIPSR as independent variables.
- **Model III:** NSEADR as dependent variable and BSEADR and DIIPSR as independent variables.

The empirical results of VECM confirmed that there is a unidirectional long run causality running from Domestic Institutional Investors' Investments to Indian stock market. Also, it is evident from the test results that there is no short-run bidirectional relationship running between DII's and Indian stock market. The empirical results also reveal a long-run bilateral relationship between BSE and NSE, but there is no short run causality between them. Therefore, it is concluded that the DIIs investments influence the price changes in the Indian stock market in the long run, whereas the Indian stock market does not influence DII's investments in both long run as well as in short run.

Variance Decomposition Analysis (VDA) is conducted to assess to what extent shocks to variable are explained by other variables in the system. The results confirmed that both the variables under consideration, namely DII (90.85 per cent) and BSE (89.39 per cent) are said to be fairly exogenous variables. NSE is almost equally influenced by DII and BSE in the short run.

Foreign Institutional Investors and Domestic Institutional Investors:

This Section of the study analyzed the co-integration between the investments made by FIIs and DIIs and consequently studied both long run and short run causal relationship i.e., unilateral or bilateral between foreign institutional investors' investments and domestic institutional investors' investments.

With regard to the BSE Sensex holding pattern, the share of FIIs significantly increased over the period and maintained the momentum in the holding pattern. FIIs share in the overall BSE Sensex value at the end of March 2009 was 19.5 per cent where this share increased to 25.9 per cent at the end of March 2013, and the share increased throughout the period during 2009-13. On the other hand DIIs share in the overall value of BSE Sensex when compared to that of FIIs is very low and recorded at 13.1 per cent at the end of March 2013.

Jarque-Bera Statistics are used to test the Normality of the variables i.e., FIIPSR and DIIPSR. As per the test statistics it is found that both the variables understudy are normally distributed. The standard deviation indicates that the FIIPSR is relatively less volatile as compared to that of DIIPSR.

Stationarity test is conducted for both the variables using graphical method by plotting the time series on graph and observing the trends in mean, variance and autocorrelation. A time series is said to be stationary if its mean and variance are constant over time. In case of both the variables the time series mean and variance are found to be constant, which indicates the presence of stationarity in time series. Further the results of the graphical method are supported by the results disclosed by the unit root tests Augmented Dickey Fuller (ADF), Phillips – Perron (PP) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) Tests. Thus, the variables are stationary and are integrated of order I (0).

Existence of co-integration between the variables is tested by using Johansen co-integration test. By using Vector Auto Regression (VAR) model the appropriate lag length 2 is determined for the model. The results of co-integrating vectors disclosed the rejection of null hypothesis of no co-integrating vectors under both the trace statistics and maximum Eigen value forms of test. The probabilities for different levels of number of co-integrated equations also confirmed the rejection of null hypothesis. Therefore it is inferred that there is a presence of even more than one co-integrated equations among the variables understudy and which confirmed a long run equilibrium correlation between the variables.

The Vector Error Correction Model (VECM) is applied to evaluate the short run properties of the co-integrated series. To maintain consistency, the same lag length (2) is used for running VECM, which was used for the conduct of co-integration test. The long run and short run causality between FIIPSR and DIIPSR are studied with the help of two models of VECM, they are:

- **Model I:** FIIPSR as dependent variable and DIIPSR as independent variables.
- **Model II:** DIIPSR as dependent variable and FIIPSR as independent variables.

The results disclosed by the VECM for Model-A confirmed that there is long run causality running from DIIPSR to FIIPSR. The short run causality from the DIIPSR to FIIPSR is analyzed by using Wald test. The null hypothesis of no short run causality from DIIPSR to FIIPSR can be rejected when the Wald test statistic is significant (<5%). As per results disclosed the test statistic is more than 5%, and the null hypothesis cannot be rejected. Therefore, it is confirmed that DIIPSR does not cause FIIPSR in the short run.

As per the results disclosed by the VECM for Model-B, the null hypothesis of no long run causality cannot be rejected and confirmed that FIIPSR does not cause DIIPSR in the long run. The short run causality from the independent variable (FIIPSR) to dependent variable (DIIPSR) is tested by using Wald test. The null hypothesis of no short run causality from FIIPSR to DIIPSR is rejected and lead to acceptance of alternate hypothesis of causality from independent variable to the dependent variable. Hence it concluded that FIIPSR does cause DIIPSR in the short run.

Finally, Variance Decomposition Analysis (VDA) is conducted to supplement the results as disclosed by the VECM. The results of VDA based on VECM for FIIPSR and DIIPSR over a 10-month horizon showed that Foreign Institutional Investors (FII's) Investments was 100 per cent explained by its own shock on the first trading day, but it continued to reduce to 73.32 per cent on the 10th month. DIIs were able to explain only 26.67 per cent of FIIs shocks at the end of 10^{th} month. On the other hand DIIs were able to explain only 21 per cent of its own shock on the first trading day, wherein this percentage went up to 44.71 per cent at the end of the 10^{th} month. The innovations in FIIs investments have explained 55 – 79 per cent, which is the major portion of the DIIs shocks.

As FIIs investments have explained most of its own shock and it does not allowed DIIs variances to contribute to it is said to be relatively exogenous. Whereas, DIIs investments are able to explain only to the extent of 45 per cent of its own shock and the rest

is explained by the variance of FIIs investments it is said to be endogenous. Moreover the results disclosed by VDA supports that of results obtained by VECM, wherein it concluded that there is unidirectional causality running from FIIs to DIIs in the short run.

The empirical results of VECM confirm a unidirectional long run causality running from Domestic Institutional Investors' (DIIs) investments to Foreign Institutional Investors' (FIIs) investments. Also, it is evident from the test results that there is short-run unidirectional relationship running from FII's to DIIs. Therefore, it is concluded that the DIIs investments are influencing the FIIs investments in the long run, whereas the FIIs investments are influencing DIIs investments in the short run.

Conclusions:

The study revealed that there is a unidirectional causality running from foreign institutional investors' investment to Indian stock market in both long-run as well as in the short-run. And also found that there is a unidirectional long run causality running from Domestic Institutional Investors' Investments to Indian stock market and there is no short-run bidirectional relationship between DII's investments and Indian stock market. The study also concluded that there is a unidirectional long run causality running from Domestic Institutional Investors' (DIIs) investments to Foreign Institutional Investors' (FIIs) investments and there is short-run unidirectional relationship running from FII's to DIIs. Finally the study revealed that there is bi-directional causality running between BSE and NSE in long- run, but there is no short run causality between them.

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