RAY: International Journal of Multidisciplinary Studies, E-ISSN: 2456-3064
Volume VIII, No. 2 / October, 2023, pp. 78-95.

An Empirical Study of Co integration and Causality among NIFTY, FII, DII and MF

Sujit Kumar Ray
State Aided College Teacher (Category-II),
Department of Commerce,
Chakdaha College,
Chakdaha, Nadia, India.
sujitray11@gmail.com

Structured Abstract:

Purpose:

After globalisation, most of the foreign International Investor (FII) destination show into the Indian stock market and make a sizeable investment. In the same way our Domestic Institutional Investor (DII) and our domestic Mutual Fund (MF) also join in the investment rally in to the stock market. Therefore, this study paper investigates whether any causal and long run equilibrium relationship among FII, DII, MF and NIFTY during the study period April 2007 to March 2019.

Design/Methodology:

For this investigation ARDL – Bound test and error correction term, pair wise Granger causality test, Impulse response function and Variance decomposition test are incorporate in this study paper to understand long run and short run relationship among the variables.

Conclusion:

An empirical result shows that when DII and MF are depended there is a co integration relationship and ECT shows a significant percentage which enable previous month disequilibrium into equilibrium in the long run. Granger causality shows a unidirectional causality among NIFTY, DII, and MF and also MF with FII. Impulse response function and variance decomposition test substantiate the previous results.

Originality/Value:

In the process of literature review, it has been found that on the very topic stock market, the impact of only MF and DII were discussed but, in this paper, another very influential factor FII has also been studied under the same light as that of MF and DII. Due to this, the paper bears its originality and value.

Key words:

FII, DII, MF, NIFTY, ARDL, ECT, GRANGER CAUSALITY, IRF, VDC.

Introduction

After restructuring of Indian stock market participants are classified into four categories namely foreign Institutional investor (FII), domestic institutional investor (DII), mutual fund (MF), and retail investor.

FII are entities like bank, insurance companies, mutual fund incorporated outside India but pool of fund proposed to invest in Indian stock market. Similarly, bank, insurance companies, and other financial institution incorporated in India and make investment in stock market they are called domestic institutional investor. On the other hand, large part of investors is not yet confident to invest directly in the stock market, they handed over their investable fund to the financial institution who invest in the stock market by their expertise, they are called mutual fund investor.

FII invest their fund in Indian stock market with the main object of better return, as India is a fast-growing emerging country and other confidence parameter are also good their choice on the Indian stock market therefore, top of the destination list. In market language FII investment are called hot money because they are easily push-up market index as a result other investor are also show their willingness and participate in the rally. Money brought in by the FIIs can be added to the foreign reserve exchequer of the RBI which can be used to discharge the import bill. So, FII investment can stimulate indirectly GDP growth. But the question is whether the growth came from their investment is sustainable. FII investment broadly influences three important fiscal parameter that is stock market, exchange rate and foreign exchange reserve. Their investment may increase inflation and create bubbles in the stock market thereby bringing volatility and financial instability due to sudden outflow of their fund. This situation also negatively impacts the foreign exchange market and as a result foreign exchange reserve tends to decrease. In an established financial market mutual fund play an important role to channelize the domestic savings into industrialisation because most of investor first choice of investment in physical assets such as real estate, gold, bank fixed deposit, etc. Due to slash of banking interest rate mutual fund industry shows a tremendous growth over the past two decade and contribute a significant a significant contribution in GDP. The most important advantage of mutual fund is the professional management of money. By applying their professional expertise make a diversified portfolio and reduce the risk of the investor. Today mutual fund organisation invests a part of fund into stock market.

Our domestic bank, domestic insurance company and other non- banking financial institution diversified their traditional financial services and as a result a large part of their investable fund invest into the stock market by their professional expertise, they are called in market language domestic institutional investor. Their investment object is mainly to optimise their ROCE but as a joint product and by product concept they push-up the index of stock market and fill the gap when needed when FII suddenly withdraw their sizeable investment amount from the market. In 2008 when liquidity crises arise FII withdrew their investment and DII fill the gap. Therefore, there is a relationship among FII, DII, MF and NIFTY. So, the object of the study paper is there any behavioural relationship among FII, DII, and MF and the impact of their investment variation upon the stock market index NIFTY. For this purpose, ARDL-bound testing approach apply to understand co-integration relationship, the ECT (error correction term) incorporated in the model to show the speed of adjustment in disequilibrium to equilibrium situation. To measure the direction of causality Granger procedure is used. Impulse response function and variance decomposition analysis are also employed to measure the variation in one variable how much explain by another variable.

Literature review

Dr Rekha and Prof Anirban Dutta (2009) analysed their paper impact of FII and DII in Indian capital market. They show that foreign institutional investor invests into two segments, that is debt and equity.

Until 2008 FII were net purchaser but in 2008 they became net seller due to global shock in capital market. But their statistical analysis show that FII investment in equity market constitute a minor portion though their confidence level and market strategies became important to the Indian capital market. It also Show that DII provide a support when crisis in the market arises.

Gordon and Gupta (2003) observed that foreign institutional investor invest their fund into Indian capital market when prices are low and sell when the prices are high thus, they become market maker. So, it isVery contradictory to say what is the causal relationship between FII investment and Indian stock market Index. They conclude that more investigation will be required to find out whether Indian stock market fluctuations are due to FII.

Jatinder Loomba (2012) in his paper investigate what is the trading behaviour of FII and their effect on the Indian equity market. The study paper analysed over ten-year period on daily basis. The empirical result Shows that there is a significant correlation between FII and Indian market, result also show that variation in the Indian capital market are due to FII net inflows.

Pooja Joshi et.al. (2015) study the co integration and causality between macro-economic factor and stock prices. Foreign institutional investor is considered one of the macroeconomic factors. Their investigation shows that there is statistically insignificant correlation in long run between FII and National stock market index nifty. Impulse response function and variance decomposition results also confirm that there is very insignificant explanation for movement of nifty due to FII both in short run and in long run.

Suchismita Sen (2012) in her study paper it is established that there is a causal relationship between FII net investment and Indian stock market return. She also fails to identify any causal relationship Between domestic mutual funds net investment and stock market return.

G. V.Satya Shekar (2014) in his book "The Indian Mutual Fund Industry" has told under the heading significance of resource mobilization that mutual fund gross resource mobilization depend upon various Factors. Out of them one of the important factors is foreign institutional investors. His empirical study also shows that FII can greatly influence the mutual fund resource mobilization.

From the above literature review it is found that results are scattered in relation to the relationship among NIFTY, FII, DII, and MF in Indian capital market specially in equity market. It is also found during literature study, there is a few research works among the relationship of the four variables taken together. This study paper attempt to fill the gap through the study of co integration and causal relationship among the variables by using ARDL approach.

Methodology and Empirical Analysis

Time series monthly data have been collected from different sources like RBI hand book of statistics, National Stock Exchange, Money Control.Com, SEBI, etc. After collection of data, I analyse their descriptive statistics. Table no. 1 shows their descriptive statistics.

Table no. 1 Descriptive Statistics of variables

	DII	FII	MF	NIFTY
Mean	2334.379	859.9559	2304.928	6779.426
Median	1952.75	83.03	824.45	5974.5
Maximum	40008.34	32371.43	24047.32	11680.5
Minimum	-16891.9	-29447.5	-10198.5	2763.65
Std.dev	8196.536	10726.14	5278.811	2247.534
Skewness	0.707689	0.01929	1.093369	0.446186
Kurtosis	5.526996	3.482096	4.84332	2.204658
J-B Stat	50.33403	1.403432	49.18894	8.573385
Prob	0	0.495734	0	0.01375

The summary statistics shows that all the mean are different there is no relation among them. Standard deviation indicates the volatility of the series which shows FII are higher volatile followed by DII, MF and NIFTY are comparatively lower volatile. Skewness measures the degree of asymmetry of distribution around its mean. Since mean value is greater than median value all the distribution are right skewed.

The mass of the distribution is concentrated on the left side. Kurtosis measure the degree to which a distribution is more or less peaked than a normal distribution. Generally, a normal distribution has a Kurtosis of 3. Kurtosis of all the variables except NIFTY are more than 3 which means the distribution has Heavier tails and sharper peak than the normal distribution, thus they are leptokurtic. The Jarque- Bera Statistics for all the variables are greater than zero and their probability shows that variables are not normally distributed.

Unit root test

Time series variable included in regression model are assumed to be stationary to avoid spurious regression. Therefore, a pre-test should be conducted to confirm that stationarity existed among the variables. This study paper uses augmented Dickey- Fuller (ADF), Philips-Perron (PP) test to check the stationarity of the variables.

Augmented Dickey-Fuller Test (ADF)

It is the most popular unit root test for time series data. In a more complicated time series, when error Term are correlated ADF test solve the unit root problem. Test statistics shows negative number, more negative result rejection of null hypothesis that there is unit root is stronger. Following ADF test is applied to test stationarity.

$$\Delta y_t = \mu + \beta_t + Y\, y_{t-1} + Y_1\, \Delta y_{t-1} + \text{- - - - - -} + Y_p\, \Delta y_{t-p} + \epsilon_t$$

Where μ is a constant term, β is the time trend co-efficient and p is the lag order. By imposing condition μ= 0 and β =0, random with drift has β =0, therefore, the model leaves both parameters free.

Phillips and Perron Test (PP Test)

Phillips and Perron developed an alternative non- parametric method for testing unit root. PP test are similar to ADF test but PP test automatic correct the ADF procedure regarding the auto correlation of error term. The asymptotic distribution of the PP- test is the same as the distribution of ADF test. Table no.2 shows the ADF and PP-test result of unit root.

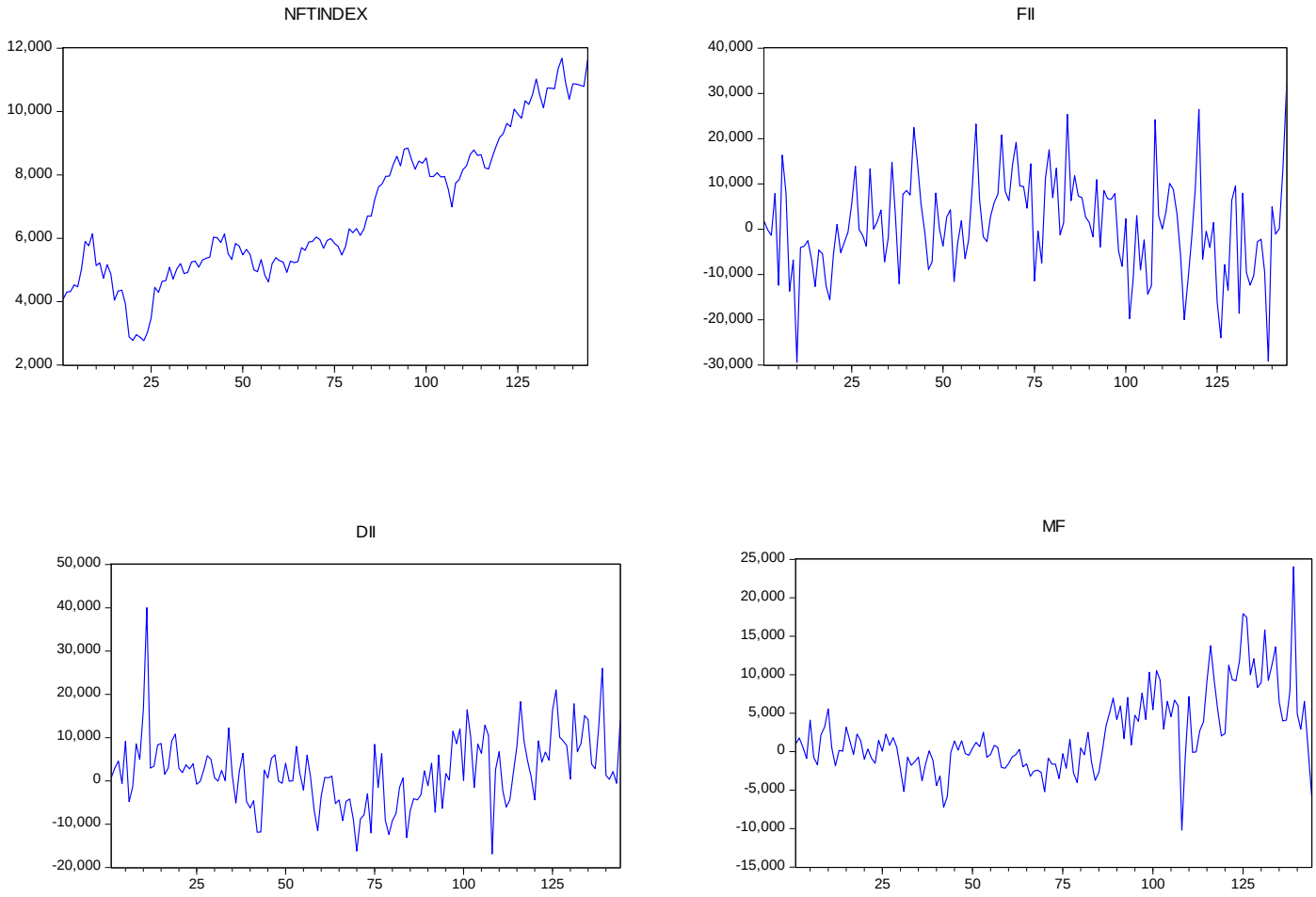


Table 2a. Augmented Dickey- fuller test result

Variable	At Level		1st difference		Decision
	With constant but no trend	With constant with trend	With constant but no trend	With constant with trend	
DII	-7.152842	-7.147615	-10.70717	-10.67441	I(0)
FII	-8.084439	-8.042457	-12.85093	-12.81990	I(0)
MF	-4.077512	-10.36902	-17.99348	-17.72355	I(0)
NIFTY	-0.105971	-2.370181	-12.23133	-9.463676	I(1)

Table 2b. Phillips and Perron test result

Variable	At Level		1st difference		Decision
	With constant but no trend	With constant with trend	With constant but no trend	With constant with trend	
DII	-7.596469	-7.593446	-27.82877	-27.20313	I(0)
FII	-8.194658	-8.154484	-35.76313	-34.47365	I(0)
MF	-10.60835	-10.53969	-27.42441	-27.68343	I(0)
NIFTY	-0.017030	-2.431205	-12.23465	-12.26902	I(1)

ARDL BOUND TEST (For Co-integration Analysis)

In order to understand the long- run relationship among NIFTY, FII, DII, MF and short run dynamic Interaction among the variables we apply the autoregressive distributed lag (ARDL) bound test technique For co- integration analysis. We apply ARDL model because except NIFTY all other variable is stationary At level, but NIFTY is stationary at 1st difference. ARDL model result gives unbiased estimates of the long run (Harris and Sollre). The ARDL equation used in this study paper are as follows.

$$D(nifty) = a_{01} + b_{11}(nifty_{t-1}) + b_{21}(fii_{t-1}) + b_{31}(dii_{t-1}) + b_{41}(mf_{t-1}) + \Sigma a_{1i}d(nifty_{t-1}) + \Sigma a_{2i}\, d(dii_{t-i}) + \Sigma a_{3i}d(mf_{t-i}) + \Sigma a_{4i}d(nifty_{t-i}) + Є_{1t} \quad .....(1)$$

$$D(fii) = a_{02} + b_{12}(nifty_{t-1}) + b_{22}(fii_{t-1}) + b_{32}(dii_{t-1}) + b_{42}(mf_{t-1}) + \Sigma a_{1i}d(fii_{t-1}) + \Sigma a_{2i}\, d(nifty_{t-i}) + \Sigma a_{3i}d(dii_{t-i}) + \Sigma a_{4i}d(mf_{t-i}) + Є_{2t} \quad .....(2)$$

$$D(dii) = a_{03} + b_{13}(dii_{t-1}) + b_{23}(fii_{t-1}) + b_{33}(nifty_{t-1}) + b_{43}(mf_{t-1}) + \Sigma a_{1i}d(dii_{t-i}) + \Sigma a_{2i}\, d(fii_{t-i}) + \Sigma a_{3i}d(nifty_{t-i}) + \Sigma a_{4i}d(mf_{t-i}) + Є_{3t} \quad .....(3)$$

$$D(mf) = a_{04} + b_{14}(dii_{t-1}) + b_{24}(fii_{t-1}) + b_{34}(nifty_{t-1}) + b_{44}(mf_{t-1}) + \Sigma a_{1i}d(mf_{t-i}) + \Sigma a_{2i}\, d(fii_{t-i}) + \Sigma a_{3i}d(nifty_{t-i}) + \Sigma a_{4i}d(dii_{t-i}) + Є_{4t} \quad .....(4)$$

In equation where p=lag order of depended variable and q= lag order of independent variable, Є is the error term of respective equation, and D is the first difference.

The first test in the ARDL co integration test is to estimate the above four equations by ordinary least squares then we apply Wald test (F-statistics) for find out long run relationship. Wald test basically the Joint significance of the co-efficient of the lagged variables by setting null hypothesis,

H_0: $b_{1i} = b_{2i} = b_{3i} = b_{4i} = 0$ against alternative hypothesis H_{1i}: $b_{1i} \neq b_{2i} \neq b_{3i} \neq b_{4i}$ where i= 1,2,3,4,5…. After getting F- statistics value we compare it to the tabulated critical value of Pessaran (2001). If the computed value is greater than tabulated upper bound value then it can be concluded that variables are co integrated, if the values are below the tabulated lower bound value, then it can be concluded that the variables are not co integrated and finally if the value are with in the upper and lower bound of tabulated Value co integrating relationship is not confirmed. Table no.3 shows the result of F-statistics and co integrating relationship.

Table no. 3: Result from ARDL bound test

Dependent variable	Lag selection through AIC and SIC criteria.	Value of F-statistics	Co integration relationship
NIFTY	3	0.97643	Not integrated
FII	2	3.178332	Not integrated
DII	1	8.801588	Integrated
MF	1	8.808422	Integrated

Critical value	Lower bound	Upper bound
1%	3.74	5.06
5%	2.86	4.01
10%	2.45	3.52

The ARDL bound test results shows that when DII and MF are dependent their calculated F-statistics value are greater than the upper bound Pessaran value and conclude that DII, NIFTY, FII, and MF are equilibrium in the long run.

After identifying co-integration relationship among the variables next step is to understand long run relationship and short run relationship and their magnitude separately. Long run coefficient and their magnitude are obtained by the following conditional ARDL (P, Q) long run model for DII and MF.

$$DII = a_0 + \Sigma a_{1i}(dii_{t-i}) + \Sigma a_{2i}(nifty_{t-i}) + \Sigma(fii_{t-i}) + \Sigma(mf_{t-i}) \quad .....(5)$$

$$MF = b_0 + \Sigma a_{1i}(dii_{t-i}) + \Sigma a_{2i}(nifty_{t-i}) + \Sigma(fii_{t-i}) + \Sigma(mf_{t-i}) \quad .....(6)$$

Table no.4 and Table no.5 shows the ARDL long run result.

Table no.4 long term regression result for DII (dependent)

Regressors	coefficient	t-values	Prob value
C	406.3173	0.245348	0.8065
NIFTY	0.208410	0.748028	0.4557
FII	-0.46670	-7.777035	0.0000
MF	0.397632	2.575280	0.0111

R-squared- 0.663079 F-statistics 91.84270
Adjusted R-squared- 0.655860 Prob of (F-stat)0.000000

Table no.5 long term regression result for Mf (dependent)

Regressors	coefficient	t-values	Prob value
C	-6544.695	-9.456896	0.000
NIFTY	1.296254	12.77732	0.000
FII	0.113747	2.575280	0.011
MF	-0.236947	-7.223445	0.000

R-squared - 0767634 F-statistics 154.1660
Adjusted R-squared- 0.762655 Prob of (F-stat) 0.000000

From DII regression it is clear that NIFTY is statistically insignificant but FII and Mf are statistically significant at 1% level of significance. For FII and DII are negatively related, that means every one-point increase in FII would reduce DII by nearly 0.467 point. Similarly, one point increase in MF would increase DII by nearly 0.3976. So, from the result we can say that when DII and MF invest their amount in market when FII withdrew their investment from the market. The value of R^2 for the estimated model is nearly 0.66 which means that the three explanatory variables together explained the variation nearly 66% although no model can explain 100% variations. The computed value of $R^2$is statistically significant, which is revealed by the statistical significance of computed F-value.

Similarly, from MF regression result it shows that all the three variables are statistically significant at 1% level of significance. FII coefficient shows negative relationship which shows 1 point increase in FII would reduce MF by nearly 0.236 point, this result emerged from earlier regression result between FII and DII. DII shows positive relationship with the MF and its coefficient signify that 1-point increase in DII would increase MF by nearly 0.11 point. Significant and interesting positive relationship come up between NIFTY and MF, NIFTY coefficient suggests that 1 point increase in NIFTY would increase MF by nearly 1.29 points. Therefore, from the analysis it is clear that NIFTY has great influence on MF. The value of R^2 for the model is nearly 0.76 which means that the three explanatory variables together explained nearly by 76% which is very fair. The computed value of R^2 is statistically significant, which is revealed by the statistical significance of computed F-value.

After analysis long run relationship among the variables, we make an arrangement for the analysis of short run dynamic relationship among the variable through the error correction model along with long run estimates that is ARDL- ECM model. We make the following two equations for DII and MF for short term dynamic analysis.

$D(dii)= a_0+ \Sigma a_{1i}\, D(dii_{t-i}) + \Sigma a_{2i} D(nifty_{t-i}) + \Sigma a_{3i} D(fii_{t-i}) + \Sigma a_{4i} D(mf_{t-i}) + \alpha Ect_{t-1} + €_t$ .....(7)

$D(mf) = a_0+ \Sigma a_{1i}\, D(mf_{t-i}) + \Sigma a_{2i} D(nifty_{t-i}) + \Sigma a_{3i} D(fii_{t-i}) + \Sigma a_{4i} D(dii_{t-i}) + \alpha Ect_{t-1} + €_t$ .....(8)

In the above equation α is the coefficient of error correction term and Ect is the error correction term represent the speed of adjustment toward the equilibrium in the long run and a_{1i}, a_{2i} , a_{3i} , a_{4i} are the short run coefficient .

Now, the above two equations for DII and MF are estimated by ols separately. Table no.6 and Tableno.7 shows the result of the said regression.

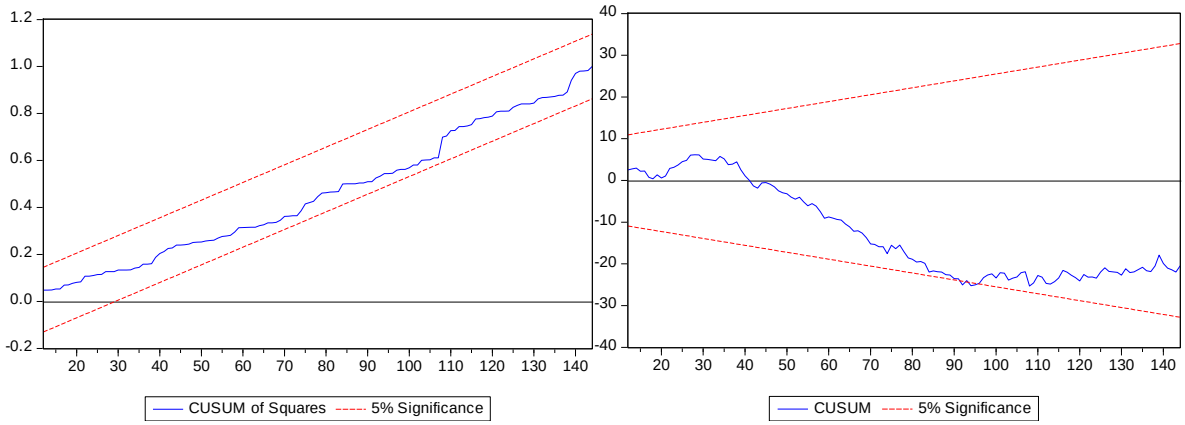
Tableno.6: Result for DII regression analysis

Regressors	Coefficient	t- statistics	Prob value
C	-239.2148	-0.367690	0.7137
D(dii(-1))	-0.098795	-0.618103	0.5375
D(nifty(-1))	3.204872	1.482423	0.14505
D(fii(-1))	-0.005944	-0.055252	0.9560
D(mf(-1))	-0.254765	-1.011345	0.3136
Ect(-1)	-0.813467	-3.829209	0.0002

R-squared 0.258076	F-statistics 9.461454
Adj R-squared 0.230800	Prob of F-stat 0.000000

From the above result it is clear that none of the short-term coefficient is statistically significant so they did not influence the DII in the short run, but Ect lagged coefficient is statistically significant at 1% level of significance. Ect lagged one coefficient signify that previous month disequilibrium converge to long run equilibrium at a speed of nearly 81% rate. Although R^2 value is low for the model but the model is statistically significant which substantiate the prob value of F-statistics.

The above short run regression model for DII does not suffer any serial correlation problem in residual as the F-statistics for serial correlation Lm test is 12.99179 at 1% level of significance, the model also does not suffer any heteroskedasticity problem because it is also passes heteroskedasticity test with F-statistics value 2.395458 at 1% significance level. Stability of the long run and short parameters have also investigated through cumulative sum (CUSUM) and cumulative sum of square (CUSUMQ). Following graph shows the result of CUSUM and CUSUMQ test.



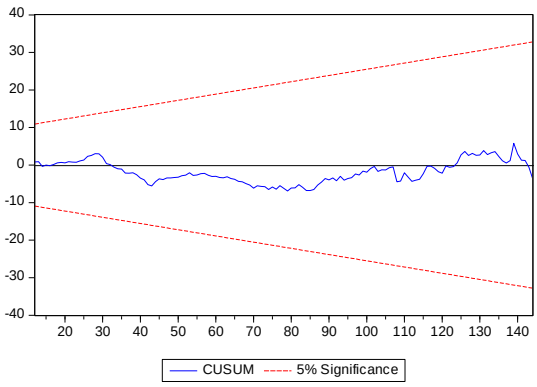
Both the result shows that all the parameter are within the critical boundaries at 5% level of significance and re is no structural break in the model. This confirm that the model is steady and appropriate also.

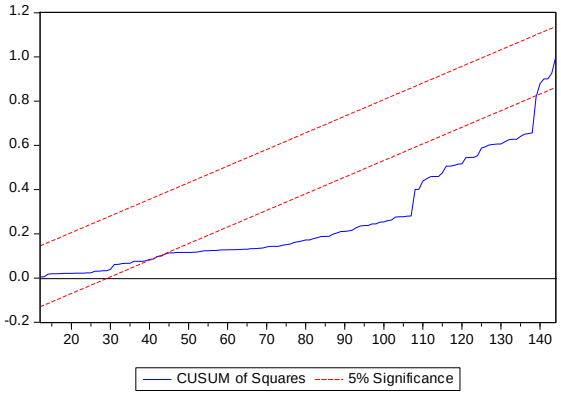
Now, we go to analysis the short-term regression results of MF. Table 7 shows the res

Tableno.7: Result for MF regression analysis

Regressors	Coefficient	t- statistics	Prob value
C	-177.7712	-0.541706	0.5889
D(mf(-1))	-0.118988	-0.791366	0.4301
D(nifty(-1))	2.997131	2.771670	0.0064
D(fii(-1))	-0.047081	-0.965269	0.3361
D(dii(-1))	-0.075826	-1.231126	0.2204
Ect(-1)	-0.370121	-2.283755	0.0239
R-squared 0.165379		F-statistics 5.389632	
Adj R-squared 0.134694		Prob of F-stat 0.000149	

Result shows that NIFTY lagged one of 1st difference and ECT lagged one are statistically significant and other explanatory variable are not statistically significant. NIFTY coefficient implies that 1 point increase in NIFTY, MF would be increased by 2.99 point at 1% significance level. ECT lagged are shows that any disequilibrium in the previous month will converge in to the equilibrium in the long run at a speed of nearly 37% at 1% level of significance. The model suffers the serial correlation problem in residual because its F-stat value is 14.28245 and their corresponding prob value is 0.0002 but the model does not possess any heteroskedasticity problem with the F-stat value 3.437001 and prob value is 0.0059. Stability of the CUSUM and CUSUMQ test.





In this case also both the parameter is within the critical boundaries at 5% level of significance in CUSUM test but outside the boundaries in CUSUMQ test and there is a structural break in the model. This also confirm that the model is not steady and not appropriate in this case.

Granger Causality Test

Dependence of one variable on another variable or variables are examined through regression analysis.Dependence of variables indicate relationship but the relationship does not indicate causality or direction. Granger causality test is one of the most important popular approaches in applied research. By applying this technique, we determine whether one variable influence another variable. Table 8 shows the result of Granger causality.

Tableno.8: Granger causality test result among NIFTY, DII, FII and MF

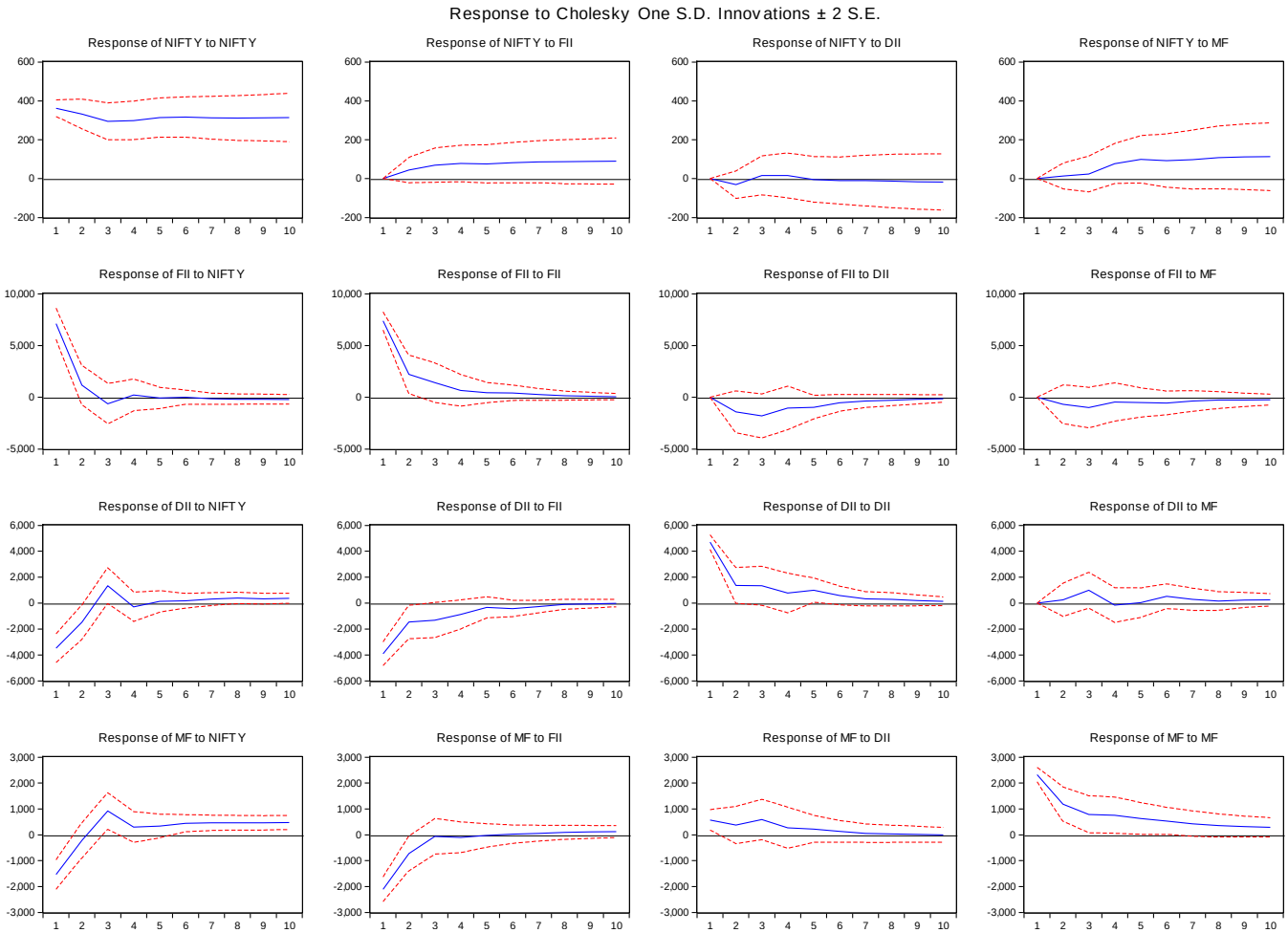
Null Hypothesis	F-statistics	Prob value
FII does not Granger cause NIFTY	0.355230	0.7854
NIFTY does not Granger cause FII	1.61927	0.1879
DII does not Granger cause NIFTY	0.64071	0.5901
NIFTY does not Granger cause DII	6.35551	0.0005
MF does not Granger cause NIFTY	0.26892	0.8477
NIFTY does not Granger cause MF	0.87667	0.0002
DII does not Granger cause FII	2.01374	0.1150
FII does not Granger cause DII	1.54490	0.2058
MF does not Granger cause FII	1.60015	0.1923
FII does not Granger cause MF	5.95302	0.0008
MF does not Granger cause DII	2.27902	0.0824
DII does not Granger cause MF	2.80189	0.0424

Reported value shows that there is a unidirectional causality between NIFTY and DII and NIFTY and MF and FII and MF bidirectional causality between MF and DII. This implies

that NIFTY is a good predictor of DII and MF, FII investment is a good predictor of MF. On the other hand, MF and DII are predictor of each other. The result also confirms that FII, DII and MF no one influence the NIFTY.

Impulse Response Analysis (IRA)

Granger causality F-test results will not show positive or negative effect on the variables and also how long it would take for the effect of that variable in the system. Another important aspect is that a shock to one variable not only directly affects itself but is also affect to all other variable through the dynamic lag structure of the VAR. Impulse response function emerges from this disadvantage. Impulse responses trace out the responsiveness of the depended variables in the VAR to shocks to each of the variables. So, for each variable a unit shock is applied to the residual term and the effects upon the VAR system over time are depicted through the analysis. Following figure shows the Impulse response graph.



In the short run (i.e., one to three month) responses of NIFTY to shock of FII and MF are slightly positive but in the long run they are steady. NIFTY own shock and DII shock does not affect the NIFTY. FII positively responses in the short run to one unit shock of NIFTY and its own but in the long run they are steady. In the short run FII negatively responses to the shock of DII and MF. But very interestingly responses of DII and MF to the shock of NIFTY and MF are similar, they show negative response in the short run but in the long run they are steady. Responses of DII and MF to each other are similar, in the short run they show positive response and in the long run their responses die out. Also, DII and MF own shock are positive in the short run but in the long run their responses also die out. In a nut shell FII and MF influence NIFTY in the short run positively but FII investment negatively influence DII and MF in the short run.

Generalised Variance Decomposition

Impulse response function shows how the effect of one variable affect other variable either positive or negative direction. Variance decomposition is an alternative method to the Impulse response function for examining the effects of shocks in the VAR system. Important aspects of variance decomposition are that it offers a proportion of the movement in the dependent variables that are due to its own shock and other variable shocks. But drawback of both Impulse response function and variance decomposition are also shows by Runckle in 1987. He argues that both are difficult to interpret accurately as in each case a confidence interval band are constructed. However, when confidence interval is wide a sharp inference is impossible. Following table shows the result of variance decomposition.

Table no. 9 Variance Decomposition of NIFTY

Period	S.E	NIFTY	FII	DII	MF
1	361.917	100	0	0	0
2	494.3842	98.74005	0.788498	0.399024	0.072426
3	580.1259	97.40144	2.009793	0.37005	0.218721
4	662.0527	95.20131	2.924157	0.340524	1.534011
5	743.2887	93.39907	3.645156	0.273587	2.982183
6	817.3642	92.24531	3.7705	0.243328	3.740861
7	884.9334	91.20231	4.171071	0.221439	4.405182
8	948.3312	90.18384	4.466859	0.212084	5.13722
9	1008.884	89.31217	4.708851	0.213064	5.765917
10	1066.564	88.58102	4.927552	0.218231	6.273201

Tableno.10 Variance Decomposition of FII

Period	S.E	NIFTY	FII	DII	MF
1	10248.76	48.22914	51.77086	0	0
2	10665.91	45.76011	52.09711	1.744537	0.398241
3	10973.65	43.55473	50.86686	4.36233	1.216083
4	11054.57	42.9635	50.4956	5.169549	1.371346
5	11116.61	42.48827	50.09082	5.858503	1.562405
6	11151.73	42.22107	49.92084	6.058867	1.799228
7	11167.56	42.11797	49.83927	6.144472	1.898289
8	11176.8	42.07486	49.77667	6.196135	1.952339
9	11183.33	42.05146	49.72594	6.219848	2.002754
10	11188.7	42.04746	49.68019	6.228421	2.043931

Tableno.11 Variance Decomposition of DII

Period	S.E	NIFTY	FII	DII	MF
1	7043.303	24.46492	30.83502	44.70006	0
2	7474.709	25.64611	31.22816	43.01294	0.112793
3	7886.78	25.94304	30.84947	41.50883	1.69866
4	7980.83	25.46682	31.35605	41.48047	1.696658
5	8049.479	25.06069	30.98683	42.28308	1.669402
6	8101.292	24.79033	30.8622	42.26747	2.080002
7	8123.063	24.79716	30.80309	42.19873	2.201014
8	8139.667	24.926	30.6906	42.15198	2.231415
9	8152.736	25.01998	30.59645	42.07935	2.304221
10	8165.87	25.145	30.49846	41.97034	2.38619

Tableno.12 Variance decomposition of MF

Period	S.E	NIFTY	FII	DII	MF
1	3540.561	18.88110	35.40382	2.616581	43.09850
2	3828.334	16.46691	33.89565	3.204882	46.43256
3	4058.944	19.76673	30.18068	4.971094	45.08150
4	4149.140	19.43235	28.94496	5.182042	46.44064
5	4215.615	19.46027	28.04357	5.297336	47.19882
6	4274.813	20.01461	27.27464	5.248709	47.46204
7	4321.413	20.71648	26.70744	5.152111	47.42397
8	4361.228	21.45250	26.26511	5.065144	47.21725
9	4398.490	22.19072	25.88238	4.981082	46.94581
10	4434.788	22.96005	25.53248	4.899922	46.60755

Empirical result shows that changed in NIFTY both in short term and in long term are due to changed its own innovative shock quantitatively it almost around 90%. Around 5% are due to FII and MF. DII has very negligible impact. Changed in FII investment in the Indian stock market are due to FII own shock and shock of NIFTY, together it explained by more than 90% rest are due to MF and DII. Very interestingly changed in DII investment are due to DII own shock and shock of NIFTY and FII in the ratio of 42:25:30 both in short run and long run. Similarly changed in MF investment mainly are due its own shock and shock of NIFTY and FII on an average 45% and 20% and 27%.

Summary and Conclusion

In economics and finance literature it is observed that FII investment in stock market influenced three important parameter and indirectly stimulate GDP growth, similarly DII and MF join in the rally. This study paper mainly investigates whether FII, DII, MF investment influence the parameter of stock market index through co-integration and causal relationship analysis. ARDL bound test result shows that when DII and MF are dependent variable there is a co-integration relationship among the variable that means they are equilibrium in the long run. But in the long run relationship among FII, DII, MF are negative, and also, they do not influence NIFTY. Further in the study of short run result it is conclude that no one variable is statistically significant except error correction term (Ect (-1)) which shows previous month disequilibrium will go into equilibrium in the long run at a rate of 81% and 37%. Granger causality test confirm that there is a unidirectional causality between NIFTY and DII and MF and also between FII and MF. Bidirectional causality between MF and DII. Impulse response function test and variance decomposition test confirm that both in the short run and long run change in NIFTY and FII are due to their own innovative shock. But changed in DII and MF are due to their own shock along with NIFTY and FII. This study helps the investor to understand the relationship among the variables and took their decision when and how much investment will get their maximum return. However, further research study can be explored by analysing other factor which are affect FII, DII and MF like interest rate, exchange rate, inflation, etc.

References

Akula, Ravi. (2011). "An overview of foreign institutional investment in India", Indian journal of Commerce & Management studies, Vol: 2, Issue: 1, January 2011, pp: 100-104.

Mohan, T. T. (2005). A Study on Capital Stock Market Movement in India – Present Scenario", European Business Review. Vol 15. Publisher: MCB UP Ltd.

Batra, A. (2004). "Foreign Institutional Investors: An Introduction", Icfai University Press, pages-107-111.

Chaitanya, Raj. (2003). "Foreign Institutional Investments", Money and Finance "Vol. 2, No. 7, October-December, pages 61-81.

Chakraborty, Rajesh. (2001). "FII Flows to India: Nature and Causes", Journal of stock market volatility, Vol: 34. Publisher: MCB UP Ltd.

Rao. (1999). "On the dynamic relation between stock prices and FIIs" Journal: Journal of ICFAI, Vol: 25. Publisher: MCB UP Ltd.

Nitin, J. (2003). Overview of the Indian Mutual Fund Industry.

Roy, Kumar Shankar. (2008). "Domestic Institutions in Buy Mode on Stock Market", The Economic Times, September 06, 2008.

Chadha, Shobhana. (2008). "Who are Foreign Institutional Investors (FIIs)?", The Economic Times, October 26, 2008.

Gaurav, Vijay. (2009). "Domestic Institutions Move in Where FIIs Fear to Trade", April 15, 2009, The Economic Times.