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Institutional Investment in the Indian Stock Market: A VAR Model Investigation

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Abstract

Institutional investment has played a major role in determining the augmentation of the Indian stock market. This study has been undertaken to reexamine this role of the institutional investors in the current scenario. The present study aims at investigating the dynamic relationship of foreign institutional investors and domestic institutional investors with the Indian stock market return, in the presence of market fundamentals such as exchange rate and call money rate. The present study has tried to analyse the dynamic interaction of these specified variables with respect to the NSE stock market index, Nifty return, by considering a period of five years, from January 2015 to December 2020. The study has used monthly data set. To explore the dynamic relationship of the institutional investments with the NSE stock market index nifty return, augmented Dickey-Fuller test and vector auto regression model have been used. The study result showed that there does not exist any interlinkage among the different variables of the study, such as FII, DII, and stock market of India.

Keywords: FII Flows, DII Flows, Indian Stock Market, Vector Auto-Regression Model

Introduction

Capital is the major component in the growth and development of the nation. Due to a scarcity of funds at the disposal of the different nations, fund needs are fulfilled by collecting funds from institutions prevailing outside the national boundaries, called foreign institutional investors, apart from getting money from domestic institutions. Although, the first preference to fulfil the financial requirements is the domestic source, in which domestic institutional investors play a significant role. However, internal funds alone are not sufficient to meet the demand, and so, it has become the necessity of the time to look for external sources, such as fund availability in the form of foreign institutions' investment in the securities market. Nowadays, the major focus of different developed and developing nations is to attract the attention of foreign institutions. It is already clear from the data set that foreign funds is the main element that has determined the economic progress of the nation since 1980. Stock market works as the mirror of the economy. Its performance shows whether the economy of the country is growing or not. The SEBI reports have shown that investment in the form of foreign institutional and domestic institutional investment has assumed a great speed in the last few decades. Fig. 1 and 2 show the information about the pattern of investment made by FII and DII, respectively, in the Indian stock market in the last six years, from January 2015 to December 2020. The figure depicted that foreign institutional investment has not shown a consistent behaviour during the period of study. Domestic institutional investment has also shown fluctuating behaviour, but compared to the FII fluctuation, it is lesser. In March 2016 and November 2019, the outflows by FII was found to be greater, which revealed that foreign institutions did not find the Indian securities market as attractive as they found it in the year 2020. The Indian securities market became the luckiest, in terms of inflow of funds by the FII in the market, in spite of COVID-19. In March 2016 and November 2019, the former demonstrated a speedy outflow of funds by the investors from the market. In 2019, inflows in the form of DII in the capital market offered a greater assistance, as it jumped 61 per cent in 2019. DII investment in the Indian securities market in the October 2019 was Rs. 67,454. August was most favourable in terms of inflow of funds, as DII infused a large amount of capital in the market.

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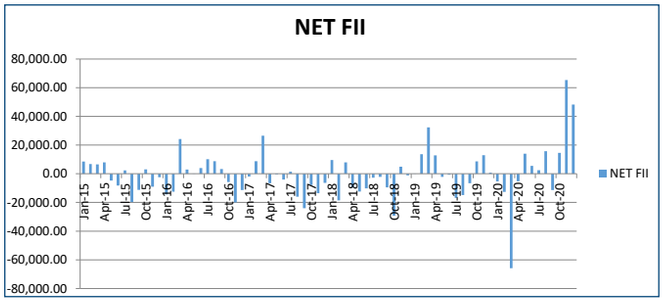
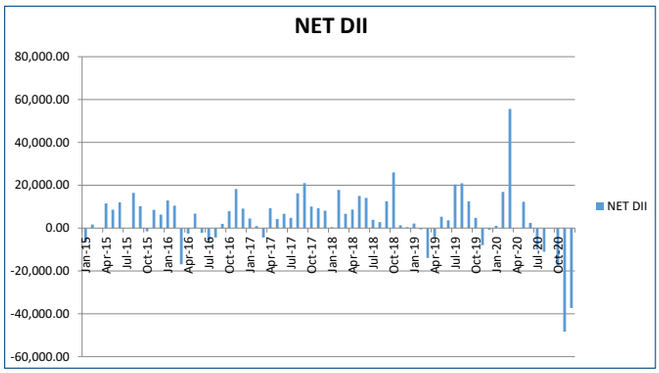


Source: Author's work on MS Excel.

Fig. 1



Source: Author's work on MS Excel.

Fig. 2

Literature Review

Aggarwal (1981) investigated the interlink between changes in dollar exchange rates and stock prices using the monthly data related to stock prices and effective exchange rate from 1974 to 1978. The study has found a positive correlation and also revealed the fact that such a relationship is stronger in the short run than in the long run.

Chakrabarti (2001) explored the causality relationship between FII flows and stock market returns. The result reported that foreign institutional investment is caused by the direction of movement of return in the Indian stock market.

Kumar (2002) explored the impact of foreign institutional investment on the volatility of the Indian stock market and found that their entry in India has ensured a favourable influence on the securities market by reducing the volatility and ensuring stability.

Dey and Mishra (2004) studied the causality relationship of the Indian stock market capitalisation with the foreign institutional investment. The result reported that investors' buying raises the stock prices, along with the trading volume.

Kumar (2006) conducted this study to analyse the co-movement between the Indian stock market and fund flows by the foreign institutional investors. As per the findings of the study, foreign institutional investors significantly have a major role in determining the direction of movement of the securities market in India.

Bhattacharya and Mukherjee (2006) conducted a causality study between foreign institutional investment and stock market return and exchange rate in India. The study has found that there exists a bi-directional causality between FII and market return, but no evidence is found with regard to any kind of causality between FII and exchange rate.

Takeshi (2008) undertook an empirical study to analyse the causal relationship between stock market return and FII flows. He also applied impulse response function to analyse the changes that took place due its own shock or shock in other variables. As the results revealed, after analysing the data set via causality or impulse response function, it is the stock market that still maintains its supremacy.

Akula (2011) discussed the status of the FII in Indian capital market liquidity and volatility. The study concluded that investment by foreign institutional investors has ensured a significant impact on the stock market volatility as well as liquidity. The result also reported that FII fund flows are positively associated with market capitalisation and market indices.

Paliwal and Vashishtha (2011) analysed the causal relationship between FII and stock market return by collecting the dataset for a total period of 19 years, from 1992-2010. As per the study outcome, there exists a bi-directional relationship among the different variables, not only in the shorter period of time, but also in the longer period.

Siddiqui and Azad (2012), using the data set related to FII and market indices for the period 2000 to 2010, concluded that some indices, such as auto, metal, and IT, are significantly influenced by the entry of FII. On the other hand, some indices, such as Bankex, Reality, power, and oil and gas are not significantly influenced by FII.

Loomba (2012) used the daily data from 2001-2011 related to the trading behaviour of FII in relation to the

stock market return in India. The overall study depicted that FII activity is positively associated with the Indian stock market.

Bhanu Murthy and Singh (2013) tried to analyse the role of FII, DII and mutual funds in the stock market of India. The outcome of the study provides evidence in the favour of the role of FII and DII in the Indian stock market, but did not find the significance of mutual fund in influencing the market.

Syamala et al. (2014) collected the data set of Indian firms from the year 2001 to 2012 to investigate the relationship between institutional ownership and stock liquidity. The study concludes that FII prefers liquid stocks.

Prusty and Vishwakarma (2014) explored the relationship between the FII and the Indian stock market BSE index to carry out the same study; monthly data set has been used. The overall result provides evidence in favour of the significance of foreign institutional investment for the stock market in India. There exists a positive relationship between the stock market and FII investment.

Waqas et al. (2015) used the monthly data pertaining to foreign portfolio investment and macroeconomic factors of different nations, such as India, China, Sri Lanka, and Pakistan. They have found that it is the stable macroeconomic environment of the nation that attracts the attention of the foreign portfolio investors.

Srinivasan and Kalaivani (2015) applied ARDL (autoregressive distributed lag) model on the data set collected from 2004 till 2011. The study results showed that in the case of Indian equity market return, the impact on FII is found to be negative for a shorter period, but the same for a longer duration turns out to be a positive impact. The result also found that as far as the impact of the US stock market return is concerned, it has shown a positive insignificant impact on FII.

Dhingra (2016), using the dynamic and static model, explored the interaction of FII with the return and volatility of the Indian stock market. The study has used vector auto regression model and found that the arrival of the FII in the Indian market has ensured the destabilising impact on the securities market.

Arora (2016) conducted a study to analyse the trading behaviour of the FII and DII in the Indian stock market and made an attempt to analyse the relationship of these institutions with the stock market return. The overall investigation found that as far as FII and DII trading behaviours are concerned, both are opposite to each other. DII played the role of a negative feedback trader, whereas the FII behaviour is found to be positive. The result also revealed that the fact is in favour of a weak negative correlation between FII and stock market return.

Pandey (2016) discussed the FII investment pattern and analysed the interrelationship of institutional flows with the stock market in India. His study found that the Indian stock market, BSE index Sensex, and fund flows by foreign institutions, are positively correlated with each other.

Vardhan and Sinha (2016) investigated the integration of FII with the Indian and US stock market by applying the vector auto regression. The VAR model analysis indicated that domestic securities market impacts the foreign institutional fund flows, whereas the US stock market did not influence FII inflows and has a minor influence on outflows. The same impact is observed, considering exchange rate as the factor.

Omar (2016) conducted this study to find out the factors that affect the investment decision of foreign institutional investment pertaining to the Indian stock market. In the study, P/E, P/B, and dividend yield have played the role of independent variables; FII is considered the dependent variable. As a result, all the above mentioned variables are significant; the most important factor influencing the FII investment decision was the P/E.

Sharma and Mittal (2019), by using the monthly data set of foreign portfolio investment and the Indian stock market, applied the causality test on a nine-year period and provided the result in favour of no causality relationship between FPIS and ratio FPIN with the stock market in India.

Gahlot (2019) undertook a study titled 'An analytical study on the role of FIIs and DIIs on Indian stock market', to examine the role of these institutions on volatility and also to analyse the causal relationship between these two categories of institutions. The study has applied Granger causality test and T-GARCH model to arrive at the conclusion. The result indicated that the magnitude of FII is found to be greater, in comparison to DII, in impacting the Indian stock market.

Parab and Reddy (2020) tried to analyse the interlinkage of FII, DII, and stock market return by taking the data

for pre- and post-demonetisation, i.e., from June 2015 to March 2018. To achieve this objective, ADF test, correlation analysis, and regression analysis have been applied.

Research Gap

After scrutinising the existing literature, it is noted that although numerous research has already been done by the different researchers in the area of FII and DII, the different studies have given a variety of opinions with regard to the relationship of FII, DII, and stock market return. In the present study, an attempt is made to study this relationship again by taking the data set of the currently prevailing situation of pandemic in the market. As the data set comprises both the pre-pandemic, as well as the pandemic, era, it provides better information with regard to the behaviour of FII and DII in the context of stock market return in the Indian stock market. The literature already revealed that the role of FII is very significant in determining the behaviour of the Indian stock market in general; however, the present research extends further by introducing the DII term and by incorporating the data set of the pandemic phase. This ensures more and better analysis.

Research Methodology

Objective of the Study: The present study attempts to answer the following research questions.

Do the FII and DII have any significant role in determining the stock market return in India?

Does FII have any significant association with DII?

The study has framed the following objectives in consideration of the above mentioned research questions.

- To examine the relationship of FII and DII with the stock market NSE index nifty return.
- To study the interlinkage between the FII and DII in the stock market of India.

To achieve these objectives, the variables of interest include net investment by FII and DII, along two macro-economic variables, such as call money rate and exchange rate. To represent the entire stock market NSE index, the nifty has been considered.

Data Sources: To analyse the dynamic interlinkage, data has been obtained from the official website of SEBI, RBI, and NSE.

Justification of the Study: The present work is undertaken to know the investment behaviour of the foreign, as well as domestic, institutional investors in the Indian stock market in the context of stock index returns. It provides a major guidance to the retail investors with respect to the best time for taking the investment decision not only in normal days, but also in the prevalent times of a pandemic. This is the reason that the existing study has considered the sample period January 2015 to December 2020.

Hypotheses of the Study

H01: No relationship exists between foreign institutional investment and stock market return.

H02: No relationship exists between domestic institutional investment and market return.

H03: No relationship is found to exist between FII and DII in the Indian stock market.

Statistical Tools

To know the basic characteristics of the different variables in the study, descriptive statistics is applied. The results pertaining to descriptive stats are shown in Table 1. As per the table, the output, that is, the average monthly foreign institutional investment, is found to be negative, whereas domestic institutional investment monthly average is positive and greater in comparison to FII. Usually, the FII investment has shown supremacy in the previous studies in terms of volume of investment. Whereas in the present analysis conducted between January 2015 and December 2020, the participation of the domestic institutional investment is found to be greater, as its mean monthly average investment is higher and positive. It reveals that domestic funds have played a greater role in terms of infusion of fund in the country's securities market. The same table of descriptive statistics also showed information regarding the value of standard deviation of the variables in the study. The standard deviation is found to be greater for FII, which is 17021.54. This statistics reported that there is a higher chance of risk in investment

by foreign institutional investment, in comparison to investment made by DII. Next, the output revealed the value of skewness and kurtosis for the different variables in the study. Skewness value is negative for DII and call money rate, whereas for the remaining variables, except the return of nifty index, its value is found to be near zero. On the other hand, kurtosis value of all the variables is found to be positive.

Further, to analyse the dynamic relationship of foreign institutional investment and domestic institutional investment with the stock market return, the econometric technique vector auto regression analysis is applied. Before applying the VAR model, the first prime task is to ensure whether the data series is stationary or not. This requires the application of some test, such as the ADF unit root or PP test, to decide the order of integration of these variables that have been analysed via descriptive statistics.

Table 1: Descriptive Statistics

	NET_FII	NET_DII	LNRETURN	EXR	CMR
Mean	−599.3064	4304.770	−0.006067	68.03342	5.996250
Median	−1502.345	4631.210	−0.006662	67.25630	6.100000
Maximum	65317.13	55595.18	0.264569	75.64000	9.230000
Minimum	−65816.70	−483719.17	−0.136976	61.76000	3.100000
Std. Dev.	17021.54	13396.56	0.053977	3.881946	1.180490
Skewness	0.395359	−0.482456	1.497932	0.256945	−0.454548
Kurtosis	7.965264	8.391560	10.42011	2.021858	3.879468
Jarque-Bera	75.83725	89.99994	192.0996	3.662533	4.800155
Probability	0.000000	0.000000	0.000000	0.160211	0.090711
Observations	72	72	72	72	72

ADF Unit Root Test

Table 2 provides information regarding the order of integration via applying augmented Dickey-Fuller test. This test states whether the time series variables are stationary or not. If it is found not to be stationary at level, then we check the same at the first difference, and so on. ADF test of unit root is based on the following statistical hypotheses:

Null Hypothesis: Time series variable is not stationary.

Alternate Hypothesis: Time series variable is stationary.

The present study tests the stationarity in the case of net FII, net DII, nifty return, exchange rate, and call money rate time series. As per the table, the resultant p-value of FII, DII, and nifty return is less than the level of significance, i.e., 5%. It shows that these variables are stationary at level form. On the other hand, the p-values of exchange rate and call money rate variables are found to be greater than .05% level of significance, which further leads to the acceptance of the alternate hypothesis.

Further, the level of stationarity for exchange rate and CMR is checked at the first difference. The results are shown in Table 3; it shows that the differenced series of both these variables are stationary. This means these variables are stationary at first difference.

Table 2: Results of Augmented Dickey-Fuller Test Statistics

Variables	*Value at Level*		
	T-Statistic	*Prob.*	*Remarks*
Net FII	−5.153134	0.0000	Stationary
Net DII	−4.686026	0.0002	Stationary
Nifty Return	−8.778043	0.0000	Stationary
Exchange Rate	−1.720073	0.4169	Non-Stationary
CMR	−1.854660	0.3516	Non-Stationary

Table 3: ADF Results after Differencing the Non-Stationary Time Series

Variables	*Value at Level*		
	T-Statistic	*Prob.*	*Remarks*
DExchange Rate	−9.072834	0.0000	Stationary
DCMR	−7.624387	0.0000	Stationary

Once all the variables become stationary, to conduct the dynamic relationship the application of vector auto

regression analysis is required. However, the VAR model requires the selection of optimal lags. So, Table 4 gives the output pertaining to the optimal lag as per the lowest information criteria. The table output of lag length criteria has chosen lag1 as the optimal.

Table 4: VAR Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1294.973	NA	2.42e+13	39.33250	39.43203	39.37183
1	-1238.576	105.9567*	5.77e+12*	37.89625*	38.29437*	38.05357*
2	-1231.565	12.53612	6.14e+12	37.95650	38.65321	38.23180
3	-1228.439	5.303684	7.37e+12	38.13452	39.12982	38.52781
4	-1219.649	14.11766	7.48e+12	38.14088	39.43476	38.65215
5	-1217.498	3.258913	9.33e+12	38.34843	39.94090	38.97769
6	-1213.473	5.732585	1.11e+13	38.49918	40.39025	39.24643

After selecting the optimal lag, vector auto regression model is applied and the results are shown in Table 5. VAR model considers all the variables, such as net FII, net DII, and nifty return, as endogenous, whereas market fundamental variables, such as CMR and exchange rate, are exogenous. The table result showed that lagged value of the foreign institutional investment, domestic institutional investment, and nifty return itself do not significantly impact the nifty return of the current period. The VAR model showed the same output when FII and DII played the role of endogenous variables. So, the overall results showed that all the variables behave independently and are not influenced by the lagged values of itself or other variables. The probability value, as well as t-statistics, are found to be insignificant for the concerned variables' lagged values.

Table 5: VAR Model

	NRETURN	NET FII	NET DII
NRETURN(-1)	-3.079339	-35601.99	443416.0
	(1.55771)	(410940.)	(227056.)
	[-1.97683]	[-0.08664]	[1.95289]
NET FII(-1)	-9.80E-06	-0.271572	1.463918
	(5.4E-06)	(1.43346)	(0.79203)
	[-1.80360]	[-0.18945]	[1.84832]
NET DII(-1)	3.17E-06	-0.364642	-0.509320
	(4.7E-06)	(1.22787)	(0.67843)
	[0.68159]	[-0.29697]	[-0.75073]
DEXCHANGE	-0.002886	-100.2622	465.7146
	(0.00168)	(443.513)	(245.054)
	[-1.71688]	[-0.22606]	[1.90046]
DCMR	0.002893	100.4962	-466.7719
	(0.00169)	(444.524)	(245.612)
	[1.71691]	[0.22608]	[-1.90044]

To study the causality relationship and to reconfirm the output shown in VAR model Table 5, Granger causality test is applied. The results are shown in Table 6. This test is also termed as the block exogenity test. Part 1 of the causality test shows that net FII and net DII both behave independently and do not have any cause-effect relationship with each other. Here the null hypotheses is 'Net FII and net DII do not cause the nifty index return'. The probability values for both is greater than the level of significance, i.e., .05 per cent. This resulted in the acceptance of the null hypothesis and concludes that nifty return is not caused by the lagged value of net FII and net DII. Similarly, the second part of Granger causality revealed the same result, i.e., in favour of no causality relationship of nifty return with net FII and net DII. The probability value is .9310 and .7665, respectively, which provides the evidence in favour of the acceptance of the null hypothesis. Part 3 of the same table of Granger causality revealed the results about the no cause-effect relationship of net DII and nifty index return and net FII. So, the overall results indicated that no cause-effect relationship exists among net FII, net DII, and nifty index return during the period of study.

Table 6: Granger Causality/Block Exogenity Test

Dependent variable: NRETURN			
Excluded	Chi-sq	df	Prob.
NET_FII	3.252967	1	0.0713
NET_DII	0.464561	1	0.4955
All	3.257593	2	0.1962
Dependent variable: NET_FII			
Excluded	Chi-sq	df	Prob.
NRETURN	0.007506	1	0.9310
NET_DII	0.088191	1	0.7665
All	0.154601	2	0.9256
Dependent variable: NET_DII			
Excluded	Chi-sq	df	Prob.
NRETURN	3.813790	1	0.0508
NET_FII	3.416274	1	0.0646
All	4.095157	2	0.1290

Conclusion

In this study, interlinkage has been analysed among the Nifty index return, net foreign institutional investment, and net domestic institutional investment, taking the time series monthly data set from January 2015 to December 2020. To analyse this interrelationship, the VAR model has been employed. The study has provided a very unique and distinct result. The variables that have been considered for the existing work behave independently and are not interconnected or affected by the other variables' values prevailing in the previous period. Although, in a maximum number of studies discussed so far, there are indications that somehow lagged value of FII and DII cause the nifty return. Similarly, in some studies, it is shown that activities of FII cause variation in the value of domestic institutional investment as well. In the present work, the sample comprises the period of the pandemic; the time of study is from January 2015 to December 2020. In the last year, i.e., 2020, FII poured the large amount of Rs.

1,52,455 crore in the equity segment of the Indian stock market, which revealed that the coronavirus pandemic dissuaded the entry of foreign funds. This unique finding further indicates that it is their own strategy and self-generated wisdom of the FII that directs their actions with regard to making investments in the Indian market. Further, activities of the FII and DII are independent. The present study findings also indicate that the time period of the study matters a lot; if any unexpected event takes place in any financial year, it may change the entire philosophy with regard to the dynamic link among the FII, DII, and the stock market.

Limitations of the Study

Inclusion of the pandemic situation in the sample period might have affected the present study.

Time period is short. By taking the data set of a longer duration period, the result might have been different.

Major Implications of the Study

This study outcome has the following policy implications:

First of all, the findings of this study are of major relevance to the policy makers, as well as for the researchers. It is a unique result, as it is conducted in the period of the coronavirus pandemic. As per the findings, it is concluded that the global crisis in the form of the coronavirus did not change the attitude of the FII towards the Indian economy. As per the findings, it can be stated that at the time of deciding the policies and regulations concerning investment and the stock market, the Indian government bodies should not consider it as a situation that is a threat to the economy. The study further concluded and guided the prospective, as well as the existing DII to decide their own strategy with regard to making investments in India, as well-maintained policies and decisions can give them an edge in their own home country over foreign institutional investors.

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