

Impact of Foreign Institutional Investors and Domestic Institutional Investors on Market returns in India during pre and post lockdown period

Paras Mahajan , BBA(FIA) & Hamendra Kumar Porwal Phd, MBA(USA), CA & Dr. Sangeeta Porwal, M.Com, M.Phil, PhD, ICWA

Masters in Commerce (2019-2021) Hindu College, University of Delhi India
&
Shaheed Sukhdev College of Business Studies University of Delhi, India.
&
Dyal Singh College University of Delhi, India

IJMSSSR 2021

VOLUME 3

ISSUE 3 MAY – JUNE

ISSN: 2582 - 0265

Abstract: This research paper explores the relationship between Foreign Institutional Investors (FIIs) and Domestic Institutional Investors (DIIs) on the Market returns in the pre and post lockdown period that was announced on 24th March 2020 to arrest the spread of corona virus, a break point from normal state of affairs. The paper builds on a broader literature of research that has highlighted the skewness in investment behaviour of FIIs and its relationship with stock market returns during the time of uncertainty. The study made use of statistical techniques like ADF (Augmented Dickey–Fuller) test to check the stationarity of the data variables, correlation analysis to study the general relationship between them, granger causality to establish a cause-effect relationship and regression analysis to infer the results with respect to the variables under study. The research establishes that FIIs are the driving force in the market in the pre lockdown period but DIIs influence the market returns in the post lockdown period. The results also indicate that domestic investor's granger caused the investments by foreign investors in the pre lockdown period but the same did not hold true post lockdown. The research concludes that domestic investors provide stable capital to the stock market and foreign investors tend to indulge in sporadic buying and selling. Thus, the capital invested by FIIs should not be treated as of going concern but of momentum and speculative trading.

Keywords: Foreign Institutional Investors, Domestic Institutional Investors, NSE Nifty Returns, Dickey- Fuller Test, Granger Causality, regression analysis.

Introduction

The great lockdown

The lockdown was propagated by the conditions developed by the SARS-2 virus or 'Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) also known as COVID-19. It originated in Wuhan, China and spread globally, causing destruction of human health, lives, and economies. As the death toll from COVID-19 rose, Honourable Prime Minister Narendra Modi announced lockdown for 21-days for the entire country in the last week of March 2020. The lockdown was to be in effect until 21 days. The notion of lockdown was linked with the incubation period of COVID-19, which is a median of 5.1 days and can be up to 14 days. (Lauer, S.A. et al. 2020). The pandemic posed a huge challenge to every country alike and even developed countries like US, Italy and Spain were struggling to control the situation. It was believed that lockdown for a sustained period was the only way to break the chain of infection. The importance of the lockdown was emphasised by the Prime Minister himself, as the failure of adherence to lockdown were to cost heavily to all the Indians. The lockdown involved isolation at homes, travel restrictions and termination of all public events. It was applied not only on an individual level but on community as well. (Alomar, A.A. et al. 2020) Unfortunately, the lockdown announced on 24th March 2020 was only the first one followed by a series of them with different guidelines for each phase.

Impact of lockdown on the Indian economy

The Indian economy tumbled like a house of cards in the coming days of the lockdown. It had a severe impact on not only financial well-being but also emotional and physical well-being. It brought the social and economic life to a standstill. The lockdown transformed into an economic and labour shock affecting the supply i.e. the production of goods and services; and the demand i.e. consumption and investment. It was rightly described as 'the worst global crisis since World War II' (International Labour Organization, 2020). As per the Asia Development Bank, the COVID-19 outbreak could cost the Indian economy between \$387 million and \$29.9 billion in personal consumption losses (Dagli, S. 2020). The sector specific impact of the lockdown gave a clear picture about the ground zero. The tourism industry practically died in the subsequent year. Since it employed more than 25 million people and contributed to around 9.2 % to GDP, millions of such people associated with industry lost their jobs (Jagan Mohan, M. 2020). The other industry severely affected with the implications caused by lockdown was the aviation sector. The aviation sector in India contributed US\$72 billion to India's GDP. If we estimate a conservative 25 per cent decline in the contribution of the aviation sector, it will amount to a loss of 18 billion. (Chaudhary, M. et al 2020). The impact of the lockdown on the informal sector was beyond measure. The majority of Indian workforce is employed in the informal sector, which is about 400 million people or 76.2% of the total workforce. (Ministry of labour & employment labour bureau. 2013) Out of this workforce, the majority are daily waged workers who migrate for work. A migration of millions of people happens from rural areas to industries for better employment opportunities. In the event of the lockdown, many of them lost work and were forced to travel by foot to their villages. Many took a solemn vow to never go back. This led to a behavioural change in the workforce. Some of these workers never returned to work in the industrial towns of Gurugram, Surat and Mumbai. They sought employment in their marginal farms or in the nearby areas. The consequences of behaviour changes forced by lockdown had pressurised MSMEs to cut back workforce. (Mahendra Dev, S. 2020). The formal labour too suffered at the hands of the lockdown and the virus. The labour, both formal and informal favoured gig economy. The work from home led to thinning boundaries between work and life due to which the gig economy and the freelancing activities flourished.

The lockdown and Indian Stock Market

The lockdown adversely affected the financial markets and economy. No previous pandemic has affected stock markets more powerfully than Covid-19. (Baker, S. R. 2020) Some economists have considered the impact of COVID-19 on the Indian stock market as a *black swan event* i.e. the occurrence of a highly unanticipated event with an extremely bad impact. (Debakshi, B. 2021). The measures to limit the spread of virus resulted in shut down of financial markets. Due to the lockdown ordered by the government of India, everything came to halt in this busiest country. The market economy crashed in all countries of the world and the stock market was the barometer to study this affect. The market reactions to the COVID-19 on trading and policies of those internationally oriented firms that had exposure to countries like China and US, were found negative. (Wagner, A. F. 2020) The Indian markets moved feverishly when the virus spread across Europe and the US. The downfall of stock markets can partially be attributed to a halt in economic activities and partially to the price pressure due to economic uncertainty and exacerbated investor fear. (Singh, B. 2020). The underlying dynamics of this downfall and subsequent fear aggravated due to lack of information regarding the new virus and it caused large volatilities in the Indian share market. This led to uncertainty in the markets and it resulted in heavy outflows in the market. As per the NSDL data, Foreign Portfolio Investors withdrew huge amounts from India—₹247.76 billion from equity markets and ₹140.50 billion from debt markets in a short span of 13 days, that is, from 1 to 13 of March 2020. This caused a lot of volatility in the capital markets and National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) halted trading using a circuit breaker on 13 March and 23 March 2020, two times within 15 days (Economic Times. 2020)

One striking observation was the quick recovery in the trading activity after the downfall. This was majorly because of the buying by the retail investor and domestic institutional investors. As the pandemic went on in its later stages, it became clear that India's response to the pandemic is of a very high order and the sentiment became positive. (Chavali, K. 2020). This prompted to study about the investments by the domestic investors, as little is known about the behaviour of DIIs during such turbulent times.

In this event, it is of paramount importance to understand the investing behaviour of the domestic investors for the home country rather than relying on the investments made by foreign investors. When the pre lockdown and

post lockdown situation of the Indian stock market is compared, one finds that before COVID-19 i.e. at the beginning of January, trade of NSE and BSE were at their highest levels hitting peak. After the outbreak of the COVID-19 and subsequent lockdown, stock market came under fear as BSE Sensex and NSE Nifty fell by 38 percent.(Ravi, R.2020) Thus, even when the losses were booked in the initial stages of the lockdown, what made the market bounce back and with a greater rigour within months of the unfolding of the lockdown?

Therefore, the present study aims to come up with the relationship between FIIs (Foreign Institutional Investors), DIIs (Domestic Institutional Investors) and Nifty returns (taken as a proxy for stock market returns) especially in the pre and post lockdown period which was announced on 24th March 2020.

FIIs and DIIs - a general investment analysis

Foreign Institutional Investors are known to have a negative effect in India's capital markets. The trading activity of foreign institutional investors reduces market volatility. This is in deep contrast to the trading activity of domestic investors which increases market volatility.(Anshuman,V.2016) In another study, a unidirectional relationship of Nifty over FIIs was observed during the long term. It was found that the correlation is higher in the bear phase vis-a vis the bull phase as participation of other investors like domestic investors, mutual and pension funds overshadow the effects of FIIs in the bull phase.(Khan,M.A.2010). FIIs were not only considered as a driving force but inflows by FIIs adequately justified the developments in the Indian capital market as well.(Loomba,J.2012). Therefore, FIIs operate as market makers, buying when prices are low and selling when prices are high.(Gordon, J.2003), The market reactions of both FIIs and DIIs is reciprocal in nature. This means that both have a negative correlation. When FIIs increase their investments, i.e. gross purchases is greater than gross sales, the DIIs start booking profits. When FIIs decrease their investments i.e. gross sales is greater than gross purchases, the DIIs start investing to buy the stocks at the prevailing low prices.(Arora,R.K.2016).

All the study conducted are under normal circumstances without any outlier event like COVID-19, which had a monumental impact on the stock market returns. The research gap existed, as there is no sentiment analysis of the investments made by FIIs and DIIs in the event of the lockdown. If FIIs were the market makers then the record hefty sell offs during the month of March 2020 would have been the point of no return for the stock markets. What transpired in the subsequent event was a rarity amongst the global market indices at that time which prompted for a deep dive analysis.

Objectives of the study

The objective of the study is

- To evaluate the relationship between FIIs and DIIs and stock market returns in the pre and post lockdown period.
- To examine the impact of Covid-19 on FIIs, DIIs and stock market returns in the event leading after lockdown.
- To establish the cause and effect relationship between FIIs, DIIs and stock market returns in the pre and post covid period.

Methodology

Hypothesis of the study

For DII

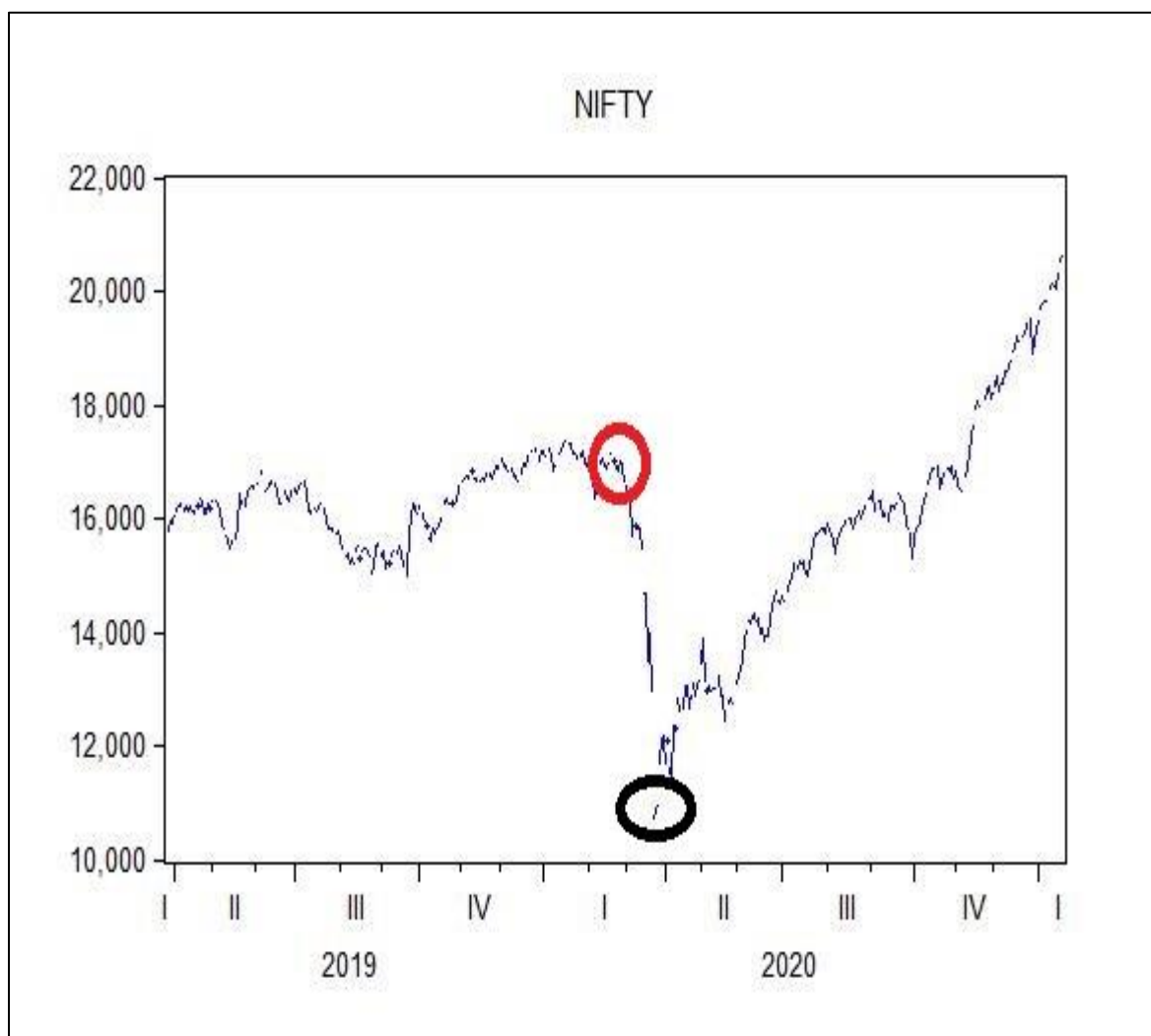
H₀ = There is no significant impact of DII on nifty returns post lockdown period.

H₁ = There is significant impact of DII on nifty returns post lockdown period.

For FII

H₀ = There is no significant impact of FII on nifty returns post lockdown period.

H₁ = There is significant impact of FII on nifty returns post lockdown period.

Graphical Analysis

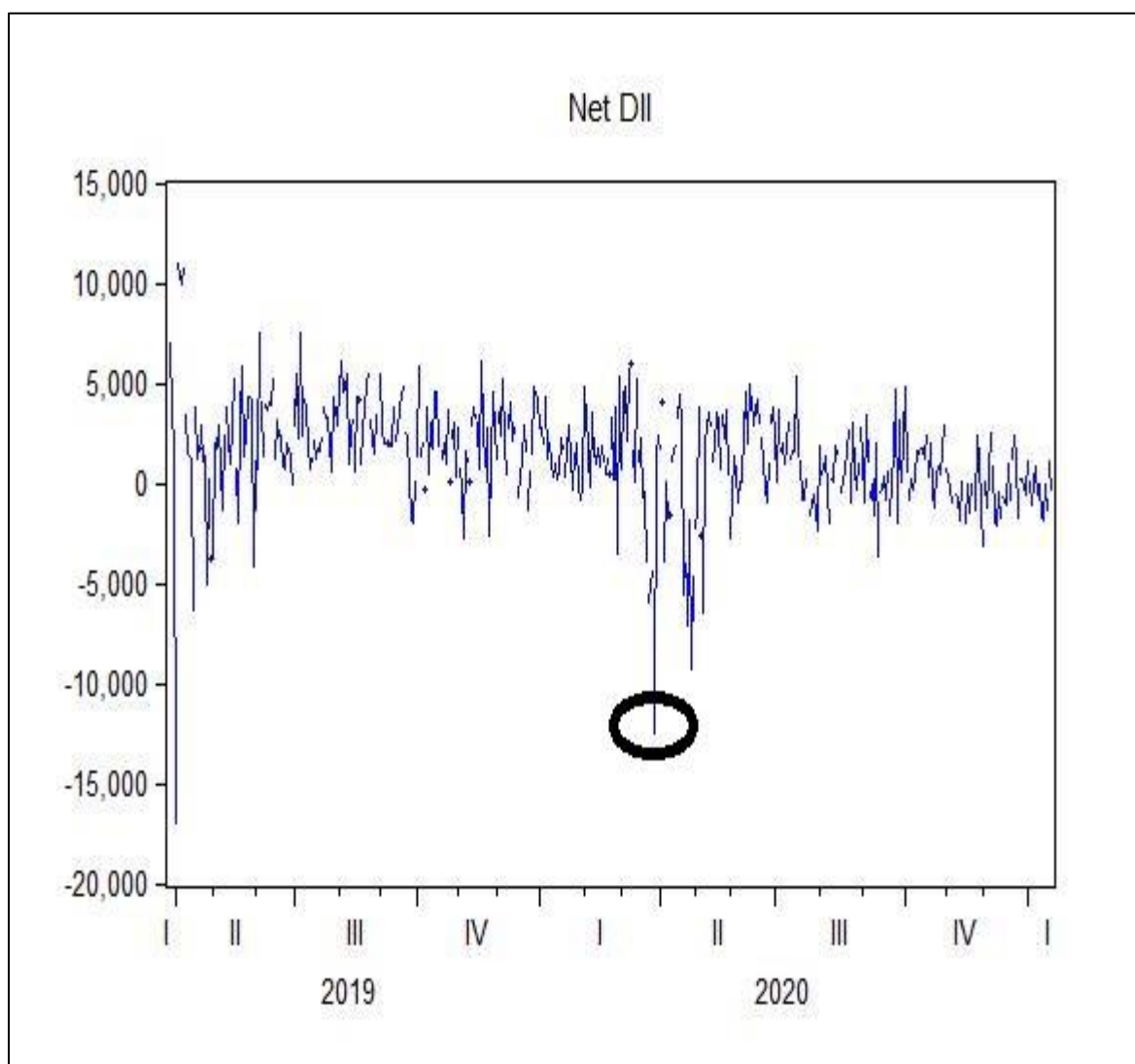
Source : Author's own representation using EViews.

The graph above depicts the closing value of Nifty index plotted from Quarter 1 of 2019 till Quarter 1 of 2021. There are two outliers in the data encircled in red and black.

The encircled observation in black shows the date of the lockdown announced i.e. 24th March 2020. Here one may observe that the closing value is lowest in the data range. This means that there was a massive sell off following the announcement of the lockdown.

The encircled data in red shows the date when the number of new cases reported in the rest of the world had exceeded the number of new cases in China where the virus originated. (Minutes from WHO director's speech). Thus, the stock market had started discounting this information in the days to come and the effect of corona virus was already depicted in the stock return level.

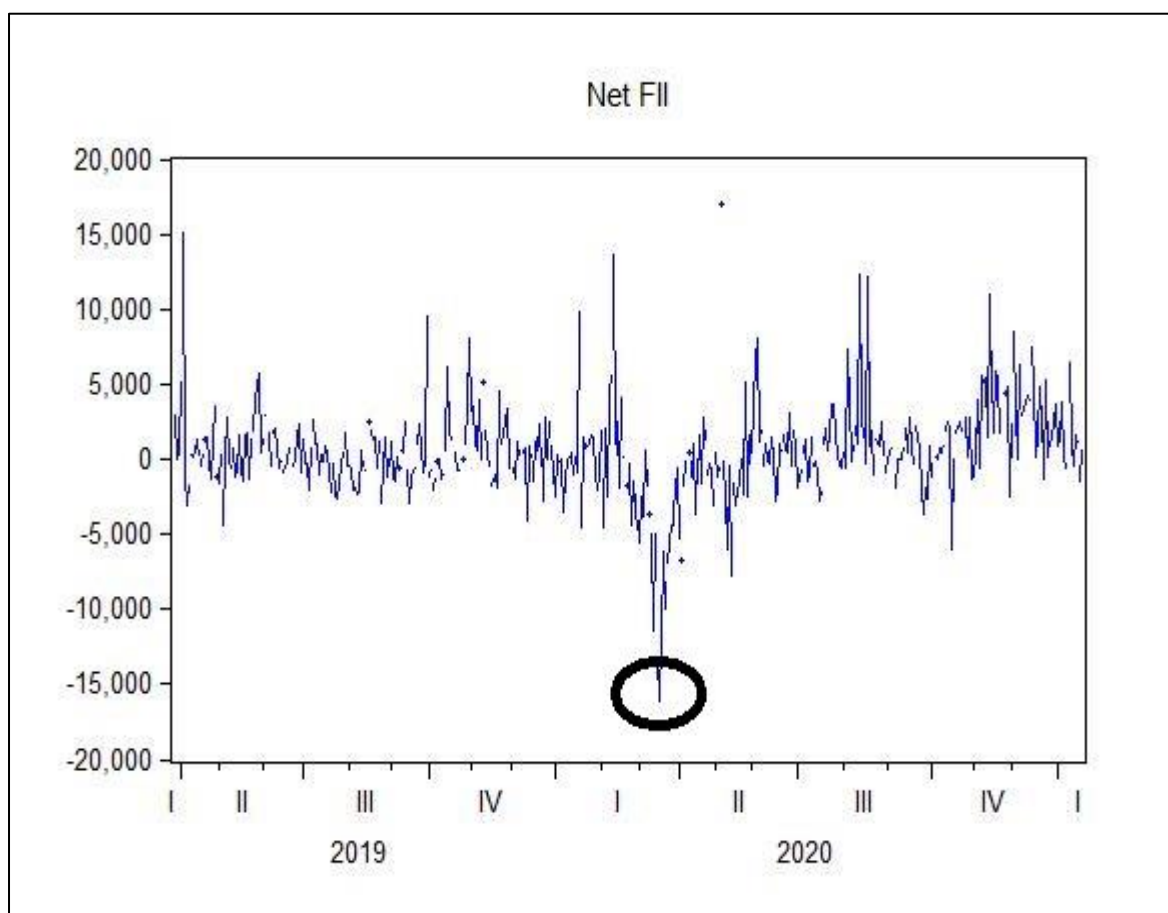
The Corona virus affect was prevalent in the case of Domestic Institution Investors or DIIs as well as FIIs. The same can be observed through the graphical presentation.



Source: Author's own representation using EViews

The encircled observation corresponds to Net DIIs, which is the lowest in the data range. This is the same date when the lockdown was announced i.e., 24th March 2020. The Net DII is calculated by subtracting the Gross Purchases with gross sales. Since the Net DIIs are negative, this means that gross sales were greater than gross purchases and there was a massive sell off by the DIIs following the announcement.

The same effect was observed in the case of Foreign Institutional Investors or FIIs as well. This can be analysed with the help of graphical representation.



Source: Author's own representation

The encircled observation corresponds to the Net FIIs, which is the lowest in the data range. This is the same date when the lockdown was announced i.e., 24th March 2020. The Net FII is calculated by subtracting the Gross Purchases with gross sales. Since the Net FIIs are negative, this means that gross sales were greater than gross purchases and there was a massive sell off by the FIIs following the announcement.

From the above data analysis, it is clear that there is a break point or structural point i.e. a period of significant change, which splits the data set into two parts. The two parts for further research is the Pre-lockdown returns and post-lockdown returns.

Hence, the variables are also analysed in two date ranges. The data source is taken from various resources as depicted in the table below.

<div> Date range → Variables ↓ </div>	Pre-lockdown i.e. from 26 th march 2019 till 24 th march 2020	Post- lockdown i.e. from 24 th march 2020 till 19 th January 2021
Nifty Index (closing values)	NSE website	NSE website
Domestic Institutional Investors	Capitaline	Capitaline
Foreign Institutional Investors	Capitaline	Capitaline

Table depicting source of data extraction

Since, one knows from general observation that there is a break point in all the following data series, hence, Chow test has been applied to detect whether there is a structural break point in the data or not. If there is no structural break point, then the two parts can be represented by one single regression line. Thus, the regression can be pooled in that sense. If there is a structural break point then the data should be divided as per the above method.

Hypothesis of Chow test:

Ho = There are no structural break points in Nifty, Net DII and Net FII data series.

H1 = There are structural break points in Nifty, Net DII and Net FII data series.

The following table depicts the statistical results.

Variable	Break date	F-statistic	P-value
Nifty	24 rd March 2020	9.282791	0.0025
Net DII	24 rd March 2020	53.27453	0.0000
Net FII	24 rd march 2020	9.832797	0.0018

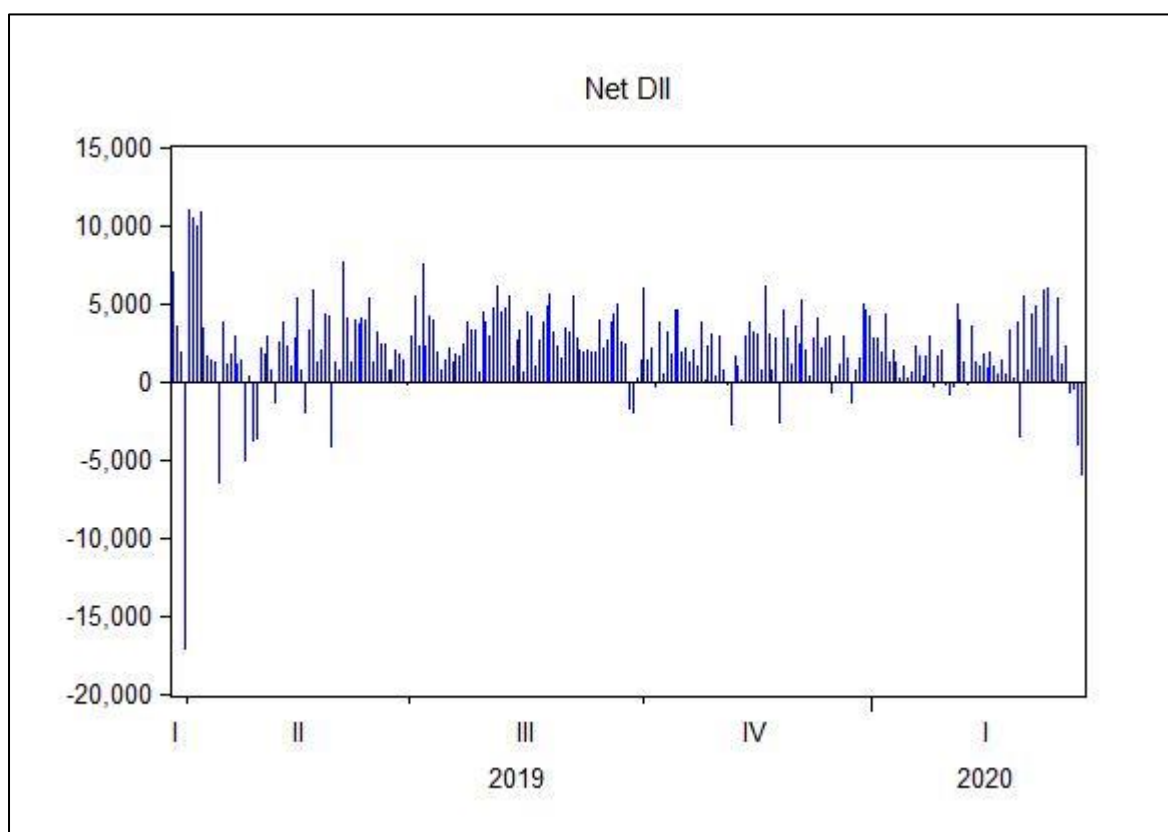
Table depicting results of Chow test using Eviews

Since, p-value is less than the α (0.05), we reject the null hypothesis and conclude that there are structural break point in Nifty, Net DII and Net FII data series and the break date is nothing but the date when the lockdown was announced at 24rd March 2020.

Hence, for further analysis we may divide the data series in two data ranges i.e. Pre-lockdown and Post- lockdown period.

Graphical Analysis in pre and post lockdown period of the variables

Net DII: Pre Lockdown

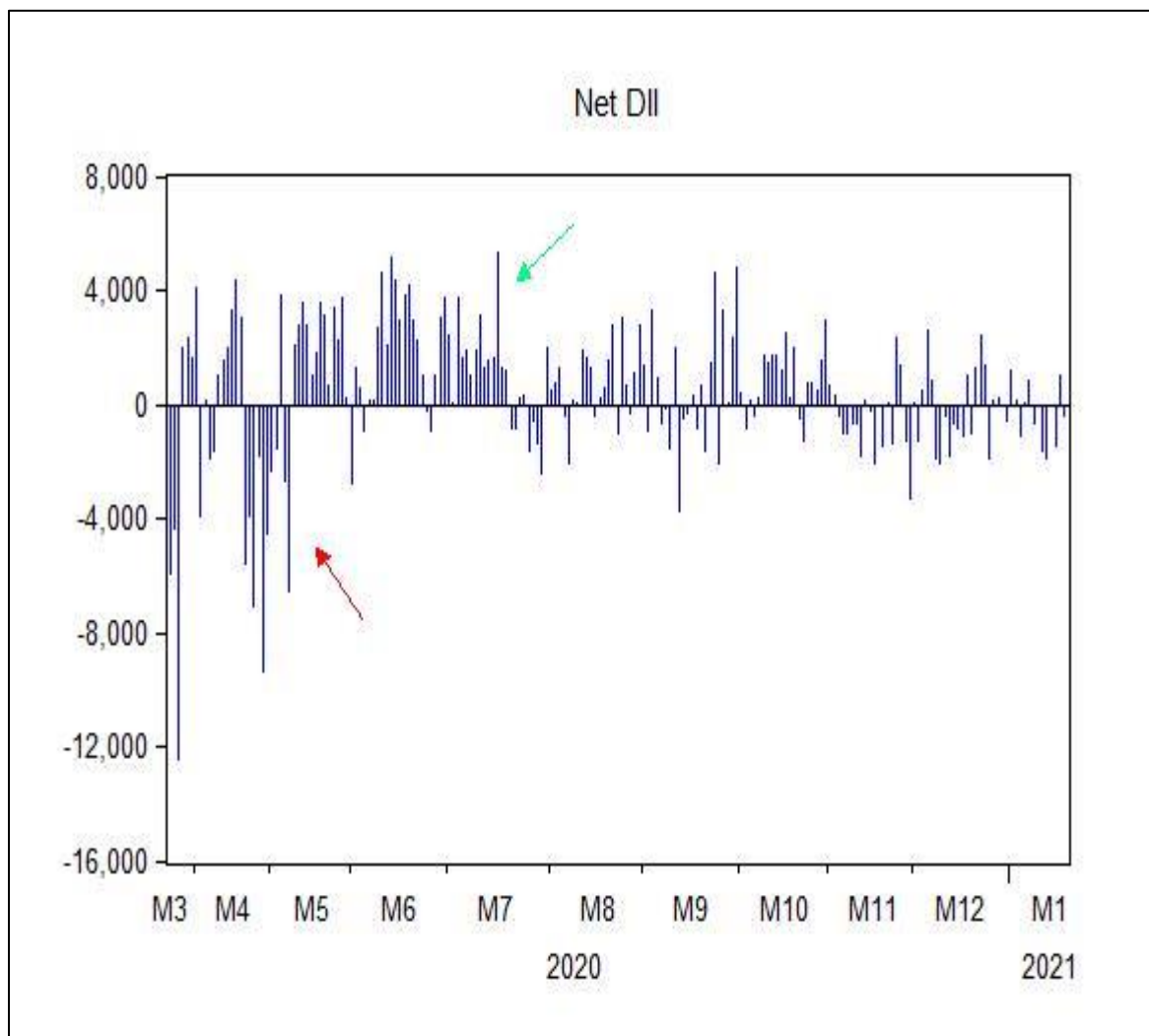


Source: Author's own representation using Eviews

In the pre- lockdown period, the general trend was positive. This is observed from the data given above. Gross purchases were more than gross sales and hence, there was more buying involved by the domestic investors. The Net DIIs are positive throughout during the pre-lockdown period and there is a general stability observed in this

period ranging from Q1 of 2019 till Q1 of 2020. There is no panic sell off prevalent in the market. Even when the world was hit by corona virus in the end of Q1 o 2020, the domestic investors were buying extensively and at the end of graph, a sell off is being observed. This is due to corona virus spreading and the corresponding announcement of the lockdown.

Net DII: Post lockdown

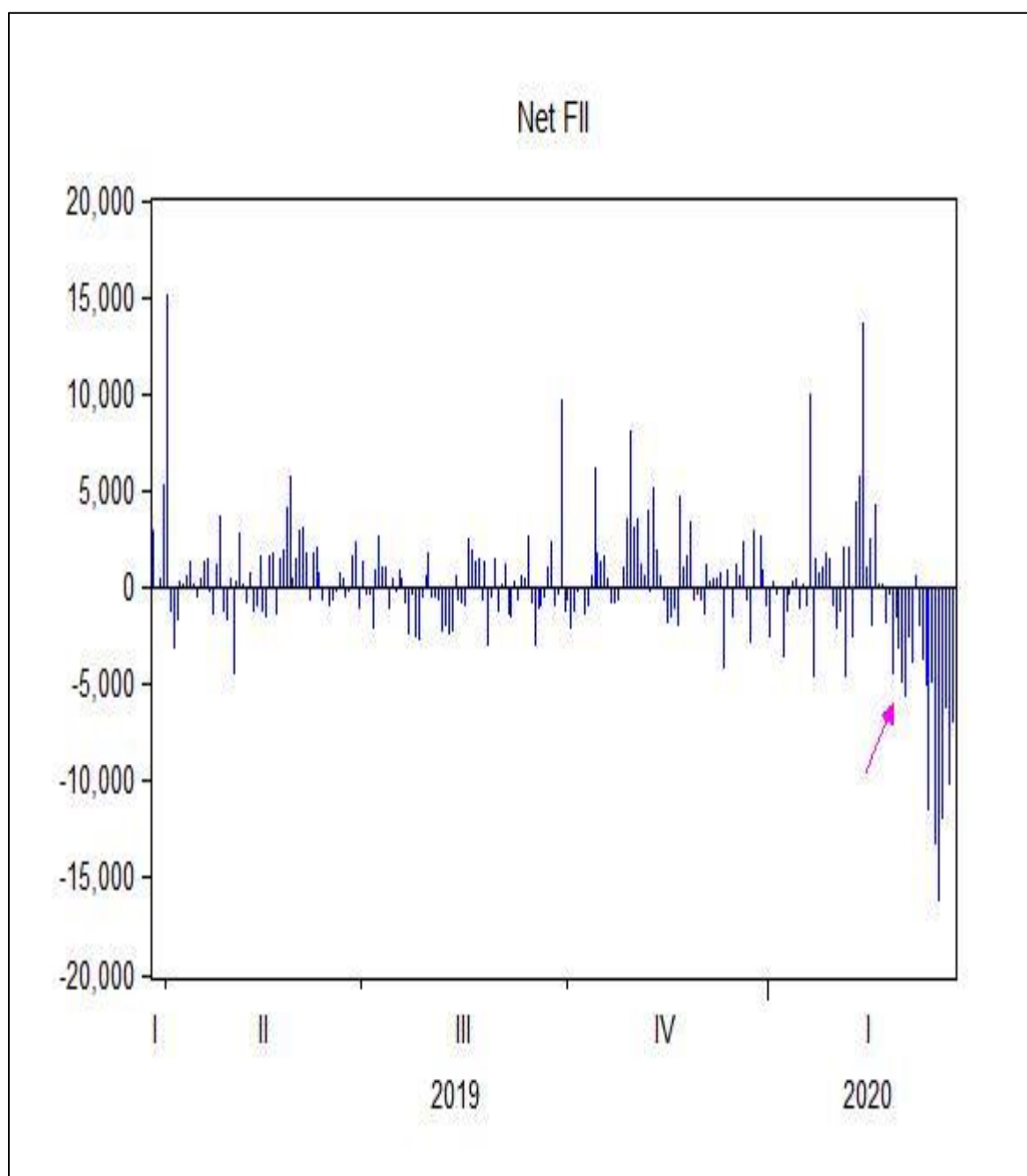


Source: Author's own representation using Eviews

Net DIIs in the post lockdown period have become more inconsistent in nature. There is a massive sell off being observed during the initial stages of the lockdown. This is being prevalent from (Month) M3 till M6 of 2020 i.e. from March till June.(Sultana,N.2020) Hence, Domestic institutional investors have retreated from the stock markets in the beginning of the lockdown period leading to panic in the stock markets due to uncertain conditions exaggerated by the corona virus. The DIIs from M6 to M9 i.e June- September period had started to bounce back in the market once again and this was majorly because of new zeal seen in the retail investors at that time. From August, the situation stabilised and the investors started looking it as the new normal and hence, there was positive and negative movements alike depicted in the graph.

One may observe that in the pre-lockdown period, investments from DIIs were more or less stable and the general trend was positive. However, it became much more erratic in the post lockdown period, as there were more negative movements observed vis-à-vis pre-lockdown period with exception of some green shoots.

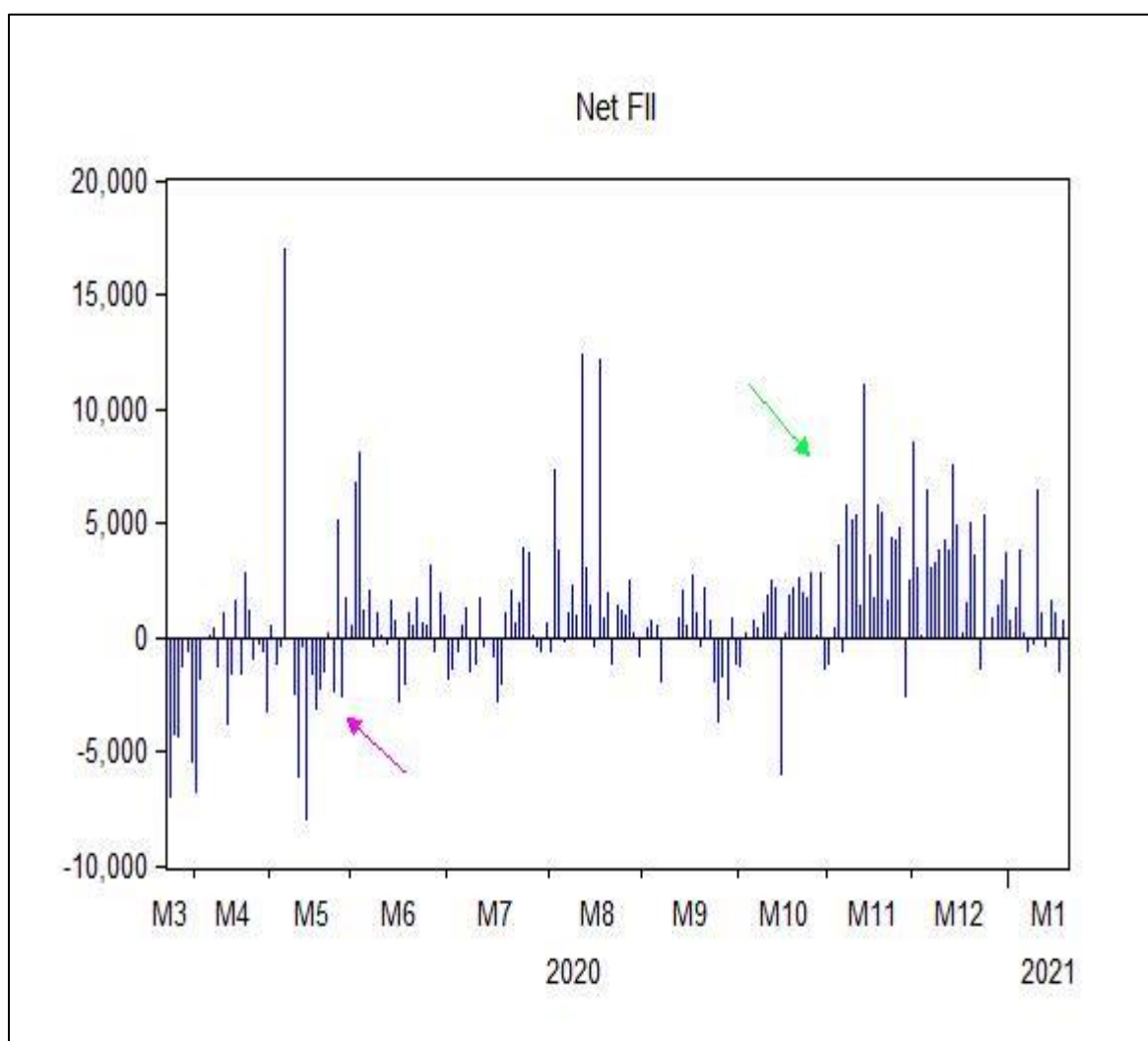
Net FII : Pre-lockdown



Source: Author's own representation using Eviews

In the pre lockdown period, one may observe that FIIs did not invest heavily in the Indian Stock market. There were corresponding selling and buying observed which is true to their nature. Net FII investment ranged from Rs 5,000 crore with couple of exceptions. Hence, there was nothing extra ordinary observation which can be analysed until the Q1 of 2020. The Quarter 1 of the year 2020 depicts the start of the corona virus and its effect can be seen in the graph as well. There was practically no buying or negligible buying involved from FIIs after the onset of corona virus in the Q1 of 2020. One striking observation which can be made is that the sell-off because of corona virus can be observed a little early in case of FIIs. This is because the virus had started spreading in the rest of the world like wild fire but in India, its impact was observed at a much later period. Thus, FIIs had already started selling their investments from the risky equity markets to safe investments like gold.

Net FII: Post lockdown



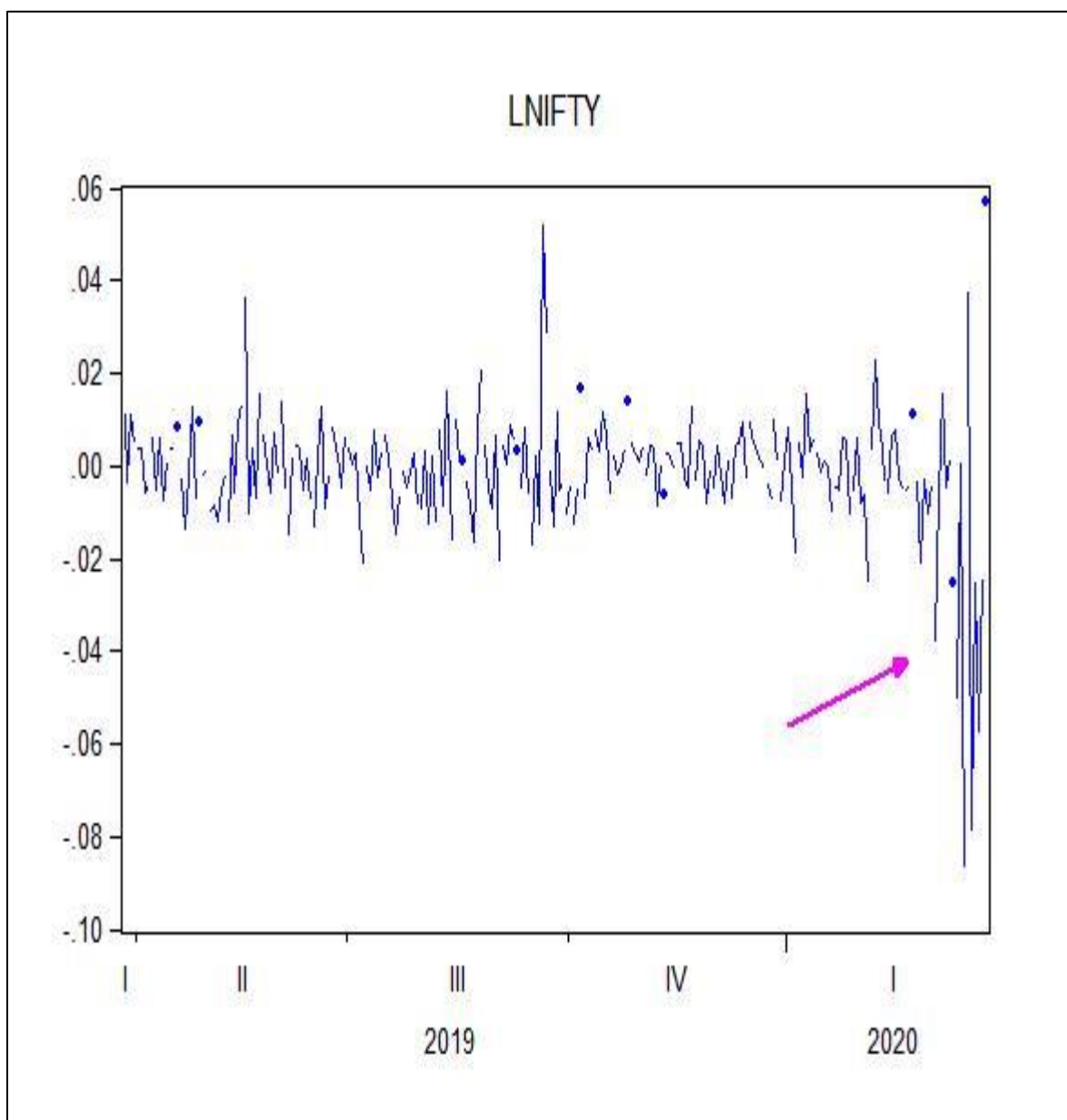
Source: Author's own representation using Eviews

The FIIs could not escape the coronavirus crisis, which cast a shadow of gloom across global markets. With rising number of coronavirus cases across the world and global markets melting under its effect, FIIs withdrew funds heavily. The FII sell-off and adverse market conditions across the globe in March weakened sentiment of Indian investors as well. Thus, there was huge sell-off observed from M3 till M6.

Having a cursory look at the data of both FIIs and DIIs, one may observe that the sell off by FIIs lasted longer than the sell off by DIIs. Hence, the DII had come to rescue of the Indian stock market and started net buying earlier than the FIIs. It seemed that FIIs delayed taking their investment action until the market correction took place. This led to a confidence in the Indian stock market. This attracted the foreign investors as well and we see increased buying once the trend was established by the DIIs post lockdown. Hence, more and more buying took place after M10 whereas it seems that DIIs had exhausted their resources by investing early.

DIIs minimised the impact of carnage on Indian indices. When FIIs were leaving Indian markets, DIIs such as LIC, public sector insurers and PSUs among others were infusing funds into equities to cap losses in Sensex and Nifty. In end of the graph, FIIs remained buyers in 4 months, while DIIs remained sellers in 3 months. Interestingly, FIIs were net sellers in each of last three months and DIIs indulged in buying activity during the same period.

Nifty Index: Pre-lockdown



Source: Author's own representation using Eviews

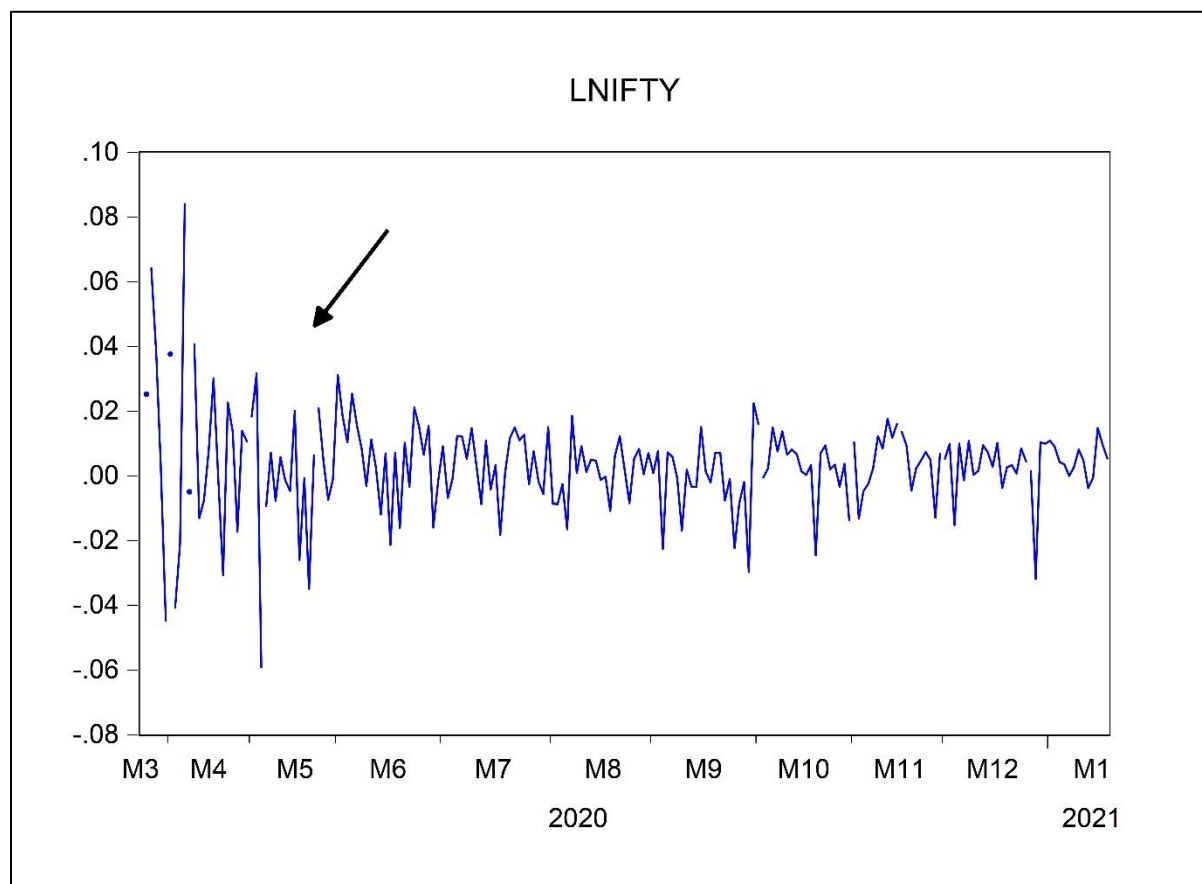
The stock returns are computed using the following formula:

$$\text{Stock Returns} = \ln (P_0/P_1)$$

Where P_0 is the current period price and P_1 is the price of the previous period. The returns are converted into log-normal form to maintain the normality of data. (Parab, N. 2020)

One may observe that the average returns lies within the range of ± 0.02 from Q1 of 2019 till Q4 of 2019. When corona virus started picking up pace, it can be seen that there is a sudden and sharp fall in the average returns of nifty index, which is depicted in the above graph by the red arrow. This fall corresponds to the period of February and March of 2020 when there was an outburst of corona virus in Indian subcontinent in the initial days.

Nifty Index: Post lockdown



Source: Author's own representation using Eviews

After the lockdown was announced, there was a massive sell off as discussed above by both the entity ; FII and DII. This led to an overall drag in the case of Nifty index. Hence, one observes that there is increase in volatility in returns post lockdown period from M3 till M6. The observation of negative returns are more as compared to the previous graph especially in the beginning as uncertainty prevailed in the Indian markets at that time. The situation was aggravated by the sell-off associated with FIIs, which was last seen during the financial crisis of 2007-08.

Statistical Analysis

As established due to the structural break point in the data series, we must analyse the data series by two different data ranges. Despite this fact, for further time series analysis it is important to check whether the data is stationary or not. This will ensure that the statistical properties of the time series do not change over time. For checking stationarity, Augmented Dickey–Fuller test (ADF) test is applied to check for the presence of unit root. This test is a check on the stationarity of the individual time series. A time series is said to be stationary when the mean and auto co variances are not dependent on time. This test is necessary because the statistical analysis performed on non-stationary time series could yield spurious results. Hence all the test variables were tested for stationarity using ADF test.

H0 = There is a unit root in the data series of Nifty, Net DII and Net FII i.e. the data series are non-stationary.

H1 = There is no unit root in the data series of Nifty, Net DII and Net FII i.e. the data series are stationary.

The result has been compiled in the following table –

Data	Test for Unit root in	t-stat	P-value
Nifty	First difference	-20.06631	0.0000
Net DII	Level	-10.24435	0.0000
Net FII	Level	-7.397119	0.0000

Table depicting results from ADF test using EViews

Since, $p \text{ value} < \alpha (0.01)$, we reject the Null hypothesis and conclude that there is no unit root present in the data series of Nifty, Net DII and Net FII i.e. the data series are stationary. Net DII and Net FII are stationary at level whereas Nifty is stationary at first difference.

Hence, the data selected for the purpose of the study are stationary and thus considered to be suitable for further analysis in the context of the study.

Analysis of Nifty, DII and FII in Pre lockdown period

For the pre lockdown period, we shall analysis the impact of DII and FII on nifty stock returns and build the hypothesis thereon. We shall first do a correlation analysis on the said variables and find how the variables are correlated. There upon, we will do a granger casualty test to detect the existence of uni- direction or bi-direction causation. After this, we will conclude our discussion by doing a regression analysis on the stock returns. This will help us in analysing the effect of DII and FII on the stock market returns.

Correlation Analysis

The method used is for the Correlation analysis is Ordinary and the sample data range for the pre-lockdown period starts from 26th March 2019 till 24th march 2020 i.e. almost one year prior to the lockdown. The data for post lockdown period starts from 24th march 2020 to 19th January 2020 i.e. almost nine months after series of lockdown as announced by the government. The observations are observed on a daily basis.

H0 = There is no correlation between Nifty, DII and FII (both pre and post lockdown)

H1 = There is correlation between Nifty, DII and FII (both pre and post lockdown)

Variables	Pre lockdown		Post lockdown	
	Net DII	Net FII	Net DII	Net FII
Nifty stock returns	-0.090224	0.193670	-0.221167	0.030118
p-value	0.1618*	0.0025**	0.0016*	0.6705**

Table depicting relationship of FIIs and DIIs with stock market returns.

One may observe that in the pre-lockdown period, there is positive correlation between FIIs and Nifty stock market returns although there is weak correlation. This means that both the variables tend to increase or decrease together. The correlation is also statistically significant as $p\text{-value} < \alpha (0.01)$. In case of DII, the correlation, though weakly negative, is not statistically significant in the pre lockdown period. This means that FIIs have a positive impact on nifty index returns in the pre lockdown period and investments made by DIIs are not statistically significant altogether.

But, the situation reverses in the post lockdown period wherein investments made by DII become statistically significant and FIIs become insignificant. In the post lockdown period, Net DII have a negative correlation with stock market returns which is statistically significant as $p\text{-value} < \alpha (0.01)$. In addition, the relationship has strengthened when one compare DII in pre and post lockdown period. As the case of FII is concerned, the correlation is not significant altogether and it has become weak as well.

The observation should not be a surprise as when the Foreign institutional investors (FIIs) sold equities worth Rs 90,043.54 crore at the time of corona pandemic, domestic institutional investors (DII) lent support to Indian indices by purchasing equities worth Rs 1, 28,208.24 crore. (Thapliyal, A.2020) Thus, when FIIs were leaving the market the DIIs showed confidence in the fundamentals and started investing heavily thereby, stabilising the index returns in the post lockdown period. Hence, when the Net DII were negative, i.e. the sales were more than purchase; the stock market returns were also negative.

Since correlation is never appropriate to conclude that changes in one variable cause changes in another, it is imperative to conduct granger causality test to determine whether a relationship is causal or not. Granger causality test is a hypothesis test to check whether one time series can provide useful information to predict the future value of another time series. Even though the test is named as causality test, the definition of causal relationship is quite different. This test determines whether one variable is able to help in forecasting the other variable apart from the lagged values of the other variable. One of the important step in Granger causality test is to select the lag order. Schwarz information criterion (SIC) was used to select the optimum lag order. It can be observed that the lag order selected by SIC was one for both pre lockdown data and post lockdown data.

Lag Length	Pre lockdown series	Post lockdown series
	SIC	SIC
0	31.40244	31.36704
1	31.06612*	31.26695*
2	31.06762	31.43658
3	31.22471	31.62030
4	31.38355	31.76633
5	31.51145	31.94361
6	31.67225	32.12124
7	31.85432	32.29057
8	32.00724	32.45071

Table depicting lag length criteria using Eviews

The results from Granger causality test are depicted below:

Null Hypothesis	Pre lockdown			Post Lockdown		
	F-stat	p-value	Result	F-stat	p-value	Result
DII does not Granger Cause NIFTY	0.11925	0.7302	Do not reject	14.8112	0.0002	Reject
NIFTY does not Granger Cause DII	3.01161	0.0840	Do not reject	4.55150	0.0341	Reject
FII does not Granger Cause NIFTY	24.2071	3.E-06	Reject	0.17211	0.6787	Do not reject
NIFTY does not Granger Cause FII	25.4136	9.E-07	Reject	0.05041	0.8226	Do not reject
DII does not Granger Cause FII	24.0426	3.E-06	Reject	0.77814	0.3788	Do not reject
FII does not Granger Cause DII	1.92926	0.1661	Do not reject	2.98075	0.0858	Do not reject

Table depicting results of granger causality

We observe that in the pre lockdown period, DII does not granger cause Nifty returns but the same does not hold true post lockdown. Hence, it can be inferred that DII investment in the stock market significantly influences the nifty returns in the post lockdown period. After the lockdown, the relationship has been a bi-directional between DII and Nifty. This means that investments by DII leads to increase in stock market returns and increase in stock market returns leads to further increase in DII investments. This was exactly as observed in the post lockdown period in the Indian stock market. Summarizing the results, a cause-effect relationship can be developed whereby

an investment by DII is the cause to stabilised returns post lockdown.

Whereas in case of FII in the pre lockdown period, there was a significant causality established in both directions. In pre lockdown period, FII investments drove stock market returns as FII granger causes Nifty and Nifty granger causes FII. Thus, investments by FII led to increase in stock market returns, which ultimately led to more investments by FII. But the post lockdown period was totally opposite for FIIs. The investments by FIIs became statistically insignificant and there was no causality observed. This was true to the fact as even when FIIs were selling heavily in the post lockdown period, there was no significant market bleeding taking place in the month of March to June i.e. initial stages of the lockdown.

One striking observation that must be highlighted is that DII granger causes FII in the pre lockdown period but it is not true in the post lockdown period. This means that when DII invested heavily in the stock markets, then FII followed them in the pre lockdown period but when the DII invested in the post lockdown period, it was not followed by investments from FII.

Thus, the granger causality test has strengthened the hypothesis that the impact of DII in the post lockdown period was statistically significant when compared to the investments made by FIIs in the Indian stock markets. Now we move to regression analysis in the post and pre lockdown period to draw further inference.

Regression Analysis in pre and post lockdown

We shall apply multiple regression as there are more than two independent variables under study. The multiple regression model would look like:

$$\text{Nifty returns} = B_0 + B_1 (\text{DII}) + B_2 (\text{FII}) + E_t$$

It becomes easy to infer the dependence of Nifty returns on the basis of these models. The b-values tell that what degree of each dependent variable affects the independent variable if all other independent variables are held constant.

The dependent and independent variables are given in the following table

Dependent variable	Independent variable
Nifty Returns	DII and FII

We now proceed to the regression analysis in the pre and post lockdown period.

Pre lockdown period

Pre Lock down				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FII	0.022704	0.003621	6.270824	0.0000*
DII	-0.000772	0.004254	-0.181552	0.8561
C	-11.15360	14.73883	-0.756750	0.4499

R-squared 0.141508
 F-statistic 19.69752
 Prob(F-statistic) 0.000000
 Durbin-Watson stat 2.418038

Hence, our estimated equation in the form of variable can be written as :

$$\text{NIFTY} = C(1)* \text{FII} + C(2)* \text{DII} + C(3)$$

Substituting the values from the table, our regression equation becomes

$$\text{NIFTY} = 0.022704* \text{FII} - 0.000772* \text{DII} - 11.15360$$

We observe that in the pre lockdown period the relationship between FII and nifty returns is significant as $p\text{-value} < \alpha (0.05)$. There is a positive relationship between FII and Nifty as the coefficient of FII is positive unlike that of DII. This means that if FII increases by one unit, then nifty increases by 0.022 units. This means as Nifty increased in the pre lockdown period, the FII started buying more and more to take advantage of the momentum. This also illustrates the confidence and certainty of investments by foreign investors in the pre lockdown period.

On the other hand, DII does not have any significant impact on nifty returns in the pre lockdown period. It also has a negative impact on Nifty returns. Therefore, when nifty returns increases, the domestic investors started selling and net DIIs becomes negative, as there is more selling than buying. According to the model, if DII increases by one unit, then nifty decreases by 0.024 units. This means as Nifty increased in the pre lockdown period, the DII started booking profits. This also illustrated the speculative nature of Domestic investors in the pre lockdown period.

The value of R square in the model is around 14%, which means that 14% variation in the independent variables is predicted in the dependent variable. Since, we have used the regression to infer the impact of FII and DII on nifty based on an event, we may look at the coefficient to look at the trend. Though the R squared value is low, still the overall fitness of the model is significant as $p\text{-value} < \alpha (0.05)$. A value of Durbin Watson test greater than two also indicates that there is no auto-correlation between the independent variables.

Post lockdown

Post Lock down				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FII	0.003509	0.004605	0.761836	0.4471
DII	-0.017394	0.006063	-2.869030	0.0046*
C	52.19086	15.49679	3.367849	0.0009

R-squared 0.043949

F-statistic 4.596877

Prob(F-statistic) 0.011172

Durbin-Watson stat 2.222758

Hence, our estimated equation in the form of variable can be written as :

$$\text{NIFTY} = C(1) * \text{FII} + C(2) * \text{DII} + C(3)$$

Substituting the values from the table, our regression equation becomes

$$\text{NIFTY} = 0.003509 * \text{FII} - 0.017394 * \text{DII} + 52.19086$$

We observe that in the post lockdown period the relationship between FII and nifty returns has become insignificant as $p\text{-value} > \alpha (0.05)$. This is in deep contrast to the pre lockdown behaviour.

On the other hand, the relationship between DII and nifty returns has become significant in the post lockdown period, which is antithesis to its pre lockdown behaviour.

The R squared value is around 4% which is on the downside as compared to the pre lockdown regression model, though the model is an overall fit as $P(f\text{-stat}) < \alpha$. A low R-squared value shows that even high-variability data can have a significant trend. This trend indicates that the predictor variable still provides information about the response even though data points fall further from the regression line. There is no auto correlation depicted by the independent variables as the value lies in the range of 1.5 to 2.5, which is consistent as before.

This further establishes the fact that in the post lockdown period, there was a significant impact of investments made by the Domestic Institutional Investors on nifty returns. Hence, when the global markets were bleeding red, the Indian stock market was experiencing green shoots orchestrated by heavy buying which was due to DIIs. This boom did not topple the stock market in the initial stages of lockdown and it attracted the Foreign Institutional Investors in the later period, which again stabilised the returns in nifty index. S

Limitation of the study

The present study may have certain limitations. As the period of study is limited and the decision of lockdown was an outlier, the relationship thus established, must be tested against other such black swan events like the COVID-19. There is room for further research since the resulting lockdown was implemented in stages, each with its own set of guidelines. The period of the study is limited as the study focuses on one year before the lockdown and approximately a year after the lockdown. The timeframe can also be extended to include a more comprehensive view of the relationship and the subsequent effect of the lockdown. The stock returns volatility can be investigated post lockdown using models like EGARCH, GARCH and so on. More variables like FDI inflows, mutual fund investments, etc. can also be studied so that the model of regression becomes a robust model for prediction and inference.

Recommendations

The study concluded that Domestic Institutional Investors have a strong impact on stock market returns. It is rudimentary to acknowledge the fact that the influence of DII and FII is a matter of the current economic scenario. The study found that Domestic institutional investors currently have a decisive role to play with respect to the performance of the Indian stock market, especially when foreign institutional investors emerge as the net sellers. Even though the average investment made by FIIs is more than domestic investors are, DIIs provide a stable and a long-term source of capital. The ownership ratio between the FII and DII has not reduced in the corona virus and lockdown period as the market witnessed quick and exponential growth in the inflows of DIIs into Indian equities and simultaneously heavier sell-off by FIIs with respect to their fresh inflows. (Nm, Natchimuthu. 2016). There are different investment strategy and parameters associated with both DIIs and FIIs. FII looks for opportunities on global landscape whereas DIIs look for domestic opportunities. Hence, DIIs strengthen the confidence in markets and participation from retail and domestic investors increases the faith in long term. The 'hot money' invested by FIIs has its own relevance as capital inflows are necessary for any developing economy which runs a huge current account deficit. The comfort is that DIIs support the market and provide a cushion when the market falls and they have been buying stocks at lower prices in every dip. DIIs can surpass the impact of FIIs but it could be possible over a period of time when the size of their investment grows further. The government should provide impetus to the Domestic investments as it directly leads to capital appreciation. It is the duty of the policy makers to create an investor-friendly atmosphere so that capital provided by domestic investors can be called as the capital of going concern.

Conclusion

The decision of lockdown was a surprise for the entire nation including stock market participants. The major stock indices experienced sell offs because of the reaction. The stock market experienced a long correction that lasted for several months, which was quite visible in our study as well. The study undertook a graphical analysis in the first case and some general observations were made by looking at the graphs. It then proceeded towards statistical analysis. The study first tested for the stationarity of the variables involved by conducting an ADF test. After finding DII and FII stationary at level and nifty index at first difference, the study proceeded to find the correlation between the variables. It was found that in the pre lockdown period, FIIs were positively correlated and the correlation coefficient of DII was insignificant. In post lockdown period, the opposite was found when DIIs were negatively correlated and the correlation coefficient of FII was statistically insignificant. The study conducted Granger causality test to establish the cause and effect relationship, which helps to demonstrate the precedence of one variable over others. Before establishing causality, the lag order was established. The SIC criteria was used and lag length of 'order one' was selected. The results of granger causality strengthened our point as there was a bi-directional relationship between DII and nifty returns post lockdown and no significant relationship between FII and nifty was found. Moreover, the erratic nature of FII was highlighted when it was found that DII granger causes FII in the pre lockdown period but not so post lockdown. The study then advanced towards a regression analysis. Here too, the study found out that in the pre lockdown period, the impact of FII on stock market was evident but after the lockdown, the DIIs were the force majeure.

Hence, For DII, we reject the null hypothesis and conclude that there is significant impact of DII on nifty returns in post lockdown period. For FII, we do not reject the null hypothesis and conclude that there is no significant impact of FII on nifty returns post lockdown period.

The DII and FII lead towards an enhanced flow of capital in the Indian economy. This helps in the effective utilization of the human and the natural resources. Since the DII is nothing but the hidden capital at home, it must be considered central to the India's integration with the global peers. The government should emphasize more on domestic investors as the investments made by them are more stable than that made by FIIs. More investments by domestic investors will lead to the capital appreciation and high economic growth in the country. In case of FII, the foreign investors can exit from the Indian market whenever they want and when FIIs indulge in massive sell offs, this shakes the stock market. It has been proved that there is no impact of FII on market returns post lockdown and therefore, the impact of sell off was minimised by the domestic buyers. Thus, for a developing economy like India, impetus should be given to domestic investors and investor-friendly policies should be made for them to attract investments for a long-term duration.

References

1. Abiad A, Arao RM, Dagli S. 2020. The Economic Impact of the COVID-19 Outbreak on Developing Asia. <https://doi.org/10.22617/BRF200096>
2. Alam. M., Chavali, K. 2020. Stock Market Response during COVID-19 Lockdown Period in India: An Event Study. The Journal of Asian Finance, Economics and Business. 7. 131-137. 10.13106/jafeb.2020.vol7.no7.131.
3. Anshuman, V.R., Acharya, V.V. & Kumar, K.K..2014. FII Flows in Indian Equity Markets: Boon or Curse?. IMF Country Report No. 14/57, February 2014
4. Arora, R.K. 2016. The Relation between Investment of Domestic and Foreign Institutional Investors and Stock Returns in India. Global Business Review. Vol 17 Issue 3.
5. Baker, S. R. ,Bloom, N. , Davis, S. J. , Kost, K. , Sammon, M. , & Viratyosin, T. 2020. The unprecedented stock market reaction to COVID-19. The Review of Asset Pricing Studies , 10 (4), 742–758.
6. Chaudhary, M., Sodani, P. R., & Das, S. 2020. Effect of COVID-19 on Economy in India: Some Reflections for Policy and Programme. Journal of Health Management, 22(2), 169–180. <https://doi.org/10.1177/0972063420935541>.
7. Debakshi, B., Basistha, D . 2021. The Outbreak of COVID-19 pandemic and its impact on stock market volatility: Evidence from a worst-affected economy. <https://doi.org/10.1002/pa.2623>
8. Economic Times . 2020. Covid-19 impact: How stock exchanges are protecting their markets from intense volatility. <https://economictimes.indiatimes.com/markets/stocks/news/covid-19-impact-how-stock-exchanges-are-protecting-their-markets-from-intense-volatility/south-korea/slideshow/74772319.cms>
9. Employment in informal sector and conditions of informal employment. Ministry of labour & employment labour bureau. Government of india. Volume iv. 2013-14. Doi : <https://labour.gov.in/sites/default/files/report%20vol%204%20final.pdf>
10. Gordon, James & Gupta, Poonam. 2003. Portfolio Flows Into India: Do Domestic Fundamentals matter?. IMF Working Papers. 03. <https://doi.org/10.5089/9781451843866.001>.
11. International Labour Organization. 2020. COVID-19 and the world of work: Impact and policy responses.
12. JaganMohan,M. 2020. Travel and tourism industry in India, statistics and facts. <https://www.statista.com/topics/2076/travel-and-tourism-industry-in-india/>
13. Khan, M.A. & Rohit, R. & Goyal, S. & Ranjan, V. & Agrawal, G. 2010. Investigation of causality between FIIs' investment and stock market returns. International Research Journal of Finance and Economics. 40, 1450-2887
14. Lauer SA, Grantz KH, Bi Q, Jones FK, Zheng Q, Meredith HR, Azman AS, Reich NG, Lessler J. 2020. The incubation period of coronavirus disease, 2019 (COVID-19) from publicly reported confirmed cases: estimation and application. Ann Intern Med. <https://doi.org/10.7326/M20-0504>.
15. Loomba,J. 2012. Do FIIs impact volatility of Indian stock market?. International Journal of Marketing, Financial Services & Management Research Vol.1 Issue 7, July 2012.
16. Mahendra Dev, S. , & Sengupta, R. 2020. Covid-19: impact on the Indian economy. Working Paper, 2020–013.
17. Meo, S.A., Abukhalaf, A.A., Alomar, A.A. et al. 2020. Impact of lockdown on COVID-19 prevalence and mortality during 2020 pandemic: observational analysis of 27 countries. Eur J Med Res 25, 56 <https://doi.org/10.1186/s40001-020-00456-9>

18. Muhammad.U, Yan.X, & Sultan, S.M.2020.The impact of Covid-19 on Gig economy, EconomicResearch-Ekonomska Istraživanja,DOI: 10.1080/1331677X.2020.1862688
19. Nm, Natchimuthu. 2016. Foreign & domestic institutional investment and stock market returns in india – a causal study. Global Journal of arts and management 2249-2658 2249-264X. 6. 1-6.
20. Parab, N., Reddy, Y.V. 2020.A cause and effect relationship between FIIs, DIIs and stock market returns in India: pre- and post-demonetization analysis. Future Business Journal Vol 6, 25
<https://doi.org/10.1186/s43093-020-00029-6>
21. Ramelli, S., & Wagner, A. F. 2020. Feverish Stock Price Reactions to COVID-19, Swiss Finance Institute Research Paper No. 20-12. DOI: doi.org/10.2139/ssrn.3550274
22. R Ravi, (2020) Impact of COVID-19 on Indian stock market. BW Businessworld
23. Singh, B., Dhall, R., Narang, S., & Rawat, S. 2020. The Outbreak of COVID-19 and Stock Market Responses: An Event Study and Panel Data Analysis for G-20 Countries. Global Business Review. <https://doi.org/10.1177/0972150920957274>
24. Sultana,N. FIIs pile into stock markets, DIIs exit. 2020. <https://www.livemint.com/market/stock-market-news/dii-august-sell-off-highest-in-17-months-fii-inflows-near-decadal-high-11598878237807.html>
25. Thapliyal ,A. Coronavirus impact: FIIs pulled out record Rs 90k cr in FY20, DIIs came to rescue. 2020. <https://www.businesstoday.in/markets/stocks/fiis-diis-selling-in-fy-20-coronavirus-lockdown-sensex-nifty/story/400082.html>
26. WHO Director-General's opening remarks at the media briefing on COVID-19 - 27 February 2020, <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---27-february-2020>