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Research Article

# A Study on the Relationship Between FPI Activities and Indian Stock Market Movements

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**Abstract:** Recent years have witnessed a meteoric rise in the value of the stock markets in India. Changes in the patterns of foreign investment in the stock markets have also experienced major shifts as a direct result of greater development and expansion. In this context, the academic community is devoting an increasing amount of time and energy to researching the connection between Foreign Institutional Investors (FIIs) and Foreign Portfolio Investors (FPIs). The purpose of this research article is to investigate the nature of this connection over the course of 15 years (2007-2022). The relationship that exists between the FPI and the returns on broad-based market indices such as the SENSEX and the NIFTY50 is investigated. The research makes use of the ADF Unit Root Test, as well as correlation, regression and the Granger Causality Analysis, with the intention of evaluating the type of link that exists between the variables as well as the direction in which causality operates. This study demonstrates, upon investigation, that FII flows have a considerable impact on the stock market indices. Furthermore, this study reveals that there is a unidirectional association between FII flows and SENSEX returns as well as NIFTY50 returns, which means that from FII flows to the index returns.

**Keywords:** SENSEX, NIFTY50, FII, Correlation, Regression and The Granger Causality Index

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## INTRODUCTION

Foreign Institutional Investment (FII) has been a key driver of stock market performance in India between 2007 and 2022. FII inflows have influenced stock market movements and have been a barometer of foreign investors' confidence in the Indian economy.

The year 2007 marked the beginning of a major bull run in the Indian stock market, which was fueled by FII investments. In 2007, FIIs pumped in a record $17.4 billion into Indian equities, which helped the Sensex reach a new all-time high of 20,873 points in January 2008. However, the global financial crisis of 2008 had a severe impact on the Indian stock market and FIIs withdrew $13.5 billion in 2008, resulting in a sharp decline in the Sensex.

The years 2009 and 2010 saw a recovery in FII inflows, as foreign investors bet on the Indian economy's growth potential. This led to a strong bull run in the stock market, with the Sensex crossing the 20,000 marks in December 2010. In 2011, however, the Eurozone crisis had a major impact on FII inflows and foreign investors pulled out $500 million from the Indian stock market in August 2011. This led to a sharp decline in the Sensex, which fell from 18,500 in August 2011 to 15,135 in December 2011.
The years 2012 to 2014 saw a recovery in FII inflows, as the Indian economy showed signs of revival under a new government led by Prime Minister Narendra Modi. This led to a strong bull run in the stock market, with the Sensex, which fell from 29,000 in April 2015 to 25,600 in December 2016.

The years 2017 to 2019 saw a recovery in FII inflows, as the Indian economy continued to grow under the Modi government. This led to a strong bull run in the stock market, with the Sensex crossing the 40,000 marks in June 2019. However, in 2020, the Covid-19 pandemic had a major impact on FII inflows and foreign investors pulled out $16.5 billion from the Indian stock market in March and April 2020. This led to a sharp decline in the Sensex, which fell from 41,000 in January 2020 to 26,000 in March 2020.

In 2021 and 2022, FII inflows have been on a recovery path, as the Indian economy shows signs of revival post the pandemic. This has led to a strong bull run in the stock market, with the Sensex crossing the 60,000 marks in November 2021.

In conclusion, FII inflows have been a major driver of stock market performance in India between 2007 and 2022. The Indian economy's growth potential and government policies have influenced foreign investors' confidence, leading to fluctuations in FII inflows and stock market movements. In 2020, the Covid-19 pandemic had a significant effect on foreign investment inflows and the market for securities. However, in 2022, FII inflows and the stock exchange had a robust bull run due to the resiliency and recovery of the Indian economy.

**Review of Literature**

- **Teli Hiteshi Akshaykumar:** This study investigates the FII flow pattern and trend in India, in addition to the connection between FII and the Sensex. The study takes into account data collected over the course of the preceding 17 years. The Sensex was selected as the benchmark for the research of the effect that FII has on the Indian stock market since it is the stock market index with the highest level of systematization and is extensively utilized by market participants for benchmarking purposes [1]
- **Chitraben Rajnikant Sheth:** To demonstrate what capital is, who can give it, how much it contributes and how it helps our market for delivering capital by doing so. It is necessary to create legislation that are friendly to the capital market. If the rules are not advantageous, foreign direct investment and foreign portfolio investment can move their money to other countries, such as Singapore, Hong Kong, Brazil, Africa, etc. As a result of demonetisation, increased crude oil prices and a 10% income tax on capital gain, among other factors, foreign institutional investors (FII) sold bonds worth 6910 million dollars in India during the 2017–2018 fiscal year. Nevertheless, as soon as the market will become steady, FII will invest their funds [2]
- **Sangeeta Sahni, MD:** As per the results, numerous investors can acquire knowledge about the correlation and impact of FII on benchmark returns, which they can afterwards apply to generate returns that surpass average. It makes sense to assume that FII is crucial to the expansion and growth of the stock market given the strength of the relationship between the two. This could bring the necessity for action to guarantee the protection of foreign investors' interests to the notice of SEBI [3]
- **Biswa Swaup Misra:** The study shows that there is a significant difference in the behaviour of FIIs when daily data are compared to monthly data. Although the examination of causality performed on monthly data did not indicate that causation ran from any particular direction, the research performed on daily data revealed that FII flows are influenced by market returns during both bear and bull periods of the market. When it comes to the topic of momentum trading, the monthly data that we looked at did not allow us to draw any meaningful conclusions about momentum trading. The utilisation of the more reliable daily data, on the other hand, demonstrated that FIIs are positive feedback traders. In neither the bull nor the bear phase did we discover any asymmetry in the trading patterns of FIIs. The findings also provide circumstantial evidence that foreign institutional investors (FIIs) contribute to the reduction of risk premiums on the Indian equity market and do not behave in a way that has a destabilising effect on the market [4]
- **Neeraj Patharkar:** In this study, the yearly closing stock values of the NSE and FII for the past ten years (2003-2013) have been compiled. The null hypothesis of a link between stock market value and FII was demonstrated to be correct by the use of the chi-square test, which is a type of statistical instrument [5]
- **Dr. Mayur Shah:** The current study investigates the pattern and trend of FII flow in India, as well as the connection between FII and the Nifty index [6]
- **Ravikumar Chitnis:** The research analyses data collected over a period of 17 years. The Sensex was chosen for the study because it is the stock market index that is the most systematic and is frequently utilized by market participants as a benchmark. The goal of the study was to determine the influence that FII has on the Indian stock market [7]

**Objectives of the Study**

- To evaluate whether there is a relationship between FII investment in India and the performance of the stock market
- To investigate the characteristics of this kind of relationship
- To establish the chain of events that led to the existence of such a relationship

**Data Collection**

Data about FIIs and FPIs was obtained from the website of NSDL (National Securities Depository Limited) on a monthly basis. The information was obtained by looking at the annual reports that FII publishes on their investments.

Official website of the NSE, which includes the NSE Nifty 50 Index Data. The data from the monthly closings have been collected and will be used in the calculation of the returns.

The official website of the BSE, which includes the S&P BSE Index Data. For the purposes of this study, monthly closing data has been collected and then converted to quarterly data.

**Statement of the Problem**

While foreign institutional investors can have a significant impact on the performance of the stock market, it is important to note that the performance of the stock market is not solely based on FII investment. There are many other factors that can influence the performance of the market, including domestic institutional investors, retail investors and the performance of individual companies. Therefore, it is important to take a holistic view of the stock market and consider all the relevant factors when analyzing its performance.

## MATERIALS AND METHODS

To gain a better understanding of the influence that FII investment has on the operation of the stock market, a quantitative approach that involves identifying variables and making use of statistical methods has been utilized. This study is empirical in nature due to the fact that it is data-driven research. The purpose of this research is to provide proof that some factors can, in some manner, affect other variables.

**Econometrics Test Fundamentals**

**Test for the Stationarity of Data; Automated Dickey-Fuller Unit Root Test:** A time series is considered stationary when its mean, variance and autocovariance do not change over the course of the study. Stationarity in data is a need for the application of the majority of the more advanced econometric techniques. The Augmented Dickey-Fuller (ADF) unit root test is what's utilized to determine whether or not there is a unit root. Data that is a stationary series at level is necessary in order to carry out Regression Analysis and to implement the Granger Causality Test.

**Unit Root Test**

Unit root test is a statistical method used to determine whether a time series dataset is stationary or non-stationary. Stationary time series data has a constant mean and variance over time, while non-stationary data has a time-varying mean and/or variance.

**Hypothesis**

- The data from the time series have a unit root, which means they are not stationary
- The data from the time series are not stationary and do not have a unit root

**Correlation**

In statistics, the concept of correlation is utilized to determine the degree to which two variables are associated with one another. It is put to use in determining whether or not there is a correlation between the quantitative variables.

In the interest of this investigation, linear correlation as determined by Pearson's correlation will do. The coefficient is being undertaken.

**Hypothesis**

- There is no correlation between the independent variable y and the dependent variable x, hence the null hypothesis is correct ($r = 0$)
- There is a correlation between the independent variable y and the dependent variable x, as shown by the fact that r is greater than 0
- Where x represents the returns on stock market indices and y represents FII investments

**Regression Analysis**

The goal of conducting a regression analysis is to determine whether or not the relationship between a dependent variable and an independent variable is one that may be considered statistically significant.

The null hypothesis asserts that the dependent variable and the independent variables do not share any relationship with one another.

There is a connection between the dependent and independent variables, as stated in the first hypothesis.

## RESULTS AND DISCUSSION

### Results of the Granger Causality Test

sAn empirical test of an analytical hypothesis, the purpose of which is to determine whether or not one time series can be usefully estimated using data from another. The link between causes and effects is founded on two postulates: first, that the cause occurs before its effect and second, that the cause possesses exclusive information about the future values of its effect. According to the explanation of the Granger causality process, "the question of whether y causes x is to determine what proportion of the present value of x can be determined from previous values of x while assessing whether adding earlier values of y can enhance these predictions." The Granger causality procedure supports this. If it is easier to anticipate x based on the past values of x and y combined than on the historical values of x alone, then it can be concluded that y is Granger inducing x.

Lagged x-values do not explain the variance in y, which means that y(t) does not Granger-cause x(t). This is consistent with the null hypothesis H0.

Lagged x-values explain the variation in y, hence y(t) is the Granger cause of x(t). This is the first hypothesis.

Where FII Investment is denoted by x and return on the stock market index is denoted by y.

### Data Analysis and Interpretation

**An Examination of the Unit Roots:** Table 1 displays the results of the tests conducted on the ADF. The data demonstrate that FII Investment, Sensex Return and Nifty Return are all levelling out at the same point.

In these cases, the unit root null hypothesis is rejected since the p-value is less than 0.05; thus, it is discovered that the series is stationary. As a result, the integration of these variables is done in the lowest possible order, denoted by the symbol I (0) (Table 1).

### Correlation Result

The fact that the coefficient of correlation is not equal to zero indicates that the null hypothesis that there is no association among the variables should be rejected. As the coefficient is not negative, there is a relationship that exists and it is one that is both positive and moderate in its nature in both of these instances. This suggests that a rise in one variable will result in an increase in the other variable. Given that the coefficient is roughly 0.3, this indicates that there is only a mild connection. Nifty, on the other hand, has a significantly greater connection than Sensex does in this regard (Table 2).

### Linear Regression

The results of using FII investment as the independent variable and the returns on stock market indices as the dependent variables in simple linear regression revealed that the relationship between the variables is statistically significant (p-values are less than 0.05, which leads to the rejection of the null-hypothesis that there is no relationship between the variables). The degree to which this link exists is shown by the coefficients. In the case of the Nifty50 index, one unit of change in FII is related to a 0.000178-unit change in Nifty returns (in the same direction) and the R-squared values that assess the fitness of the model imply that FII investment may explain 12.03% of the fluctuations in Nifty. The results are almost the same for the Sensex returns as well. The coefficient indicates that a one-unit change in FII investment is associated with a 0.000169 -unit change in Sensex returns (in the same direction) and the R-squared values determine the fitness of the model, suggesting that FII investments can explain 11.72% of the variations in Sensex returns (Table 3).

Table 1: An Examination of the Unit Roots

| Parameter | ADF-statistics | * | ** | *** | Pb |
|---|---|---|---|---|---|
| Yields- Nifty | -13.0898 | -3.4648 | -2.8766 | -2.5749 | 0.0000 |
| FII | -8.6424 | -3.4646 | -2.8765 | -2.5748 | 0.0000 |
| Yields- Sensex | -12.6235 | -3.4648 | -2.8766 | -2.5749 | 0.0000 |

*1%, **5%, ***10%, Pb-Probability

Table 2: Correlation Result

| Input Variables | FII Co-efficient of correlation |
|---|---|
| Yields- Nifty | 0.3507 |
| Yields | 0.3423 |

Table 3: Linear Regression

| Input Variable | t-stat | Co-efficient | Pb | Standard error | R-squared |
|---|---|---|---|---|---|
| Sensex | 5.0083 | 0.000169 | 0.00000 | 3.8 | 0.11717 |
| Nifty | 5.1487 | 0.000178 | 0.00000 | 3.4 | 0.12301 |

Table 4: Granger Causality

| Proposition | Annotations | F-stat | Pb |
|---|---|---|---|
| FII does not Granger Cause NIFTY | 189 | 9.29258 | 0.0001 |
| NIFTY does not Granger Cause FII | 189 | 0.26860 | 0.7647 |
| FII does not Granger Cause Sensex | 189 | 7.74798 | 0.0006 |
| Sensex does not Granger Cause FII | 189 | 0.26091 | 0.7706 |

**Granger Causality**

There is a strong correlation between FII and the stock exchange indexes, according to the Granger causality test results. For both the SENSEX and the NIFTY, there is a unidirectional relationship that moves in the direction of FII Investment to Stock Market Index Returns. The null hypothesis that FII does not cause Index Returns is rejected since the p-value for the pairwise Granger causality between Sensex and FII and between Nifty and FII is less than 0.05. The p-value is less than 0.05, which explains this. This verifies the presence of causation. Nevertheless, the link cannot be considered bidirectional since the p-value for the Index Returns causing FII is more than 0.05 and the null hypothesis cannot be rejected as a result. Thus, it implies that FII Investments are the reason behind the stock market's performance (Table 4).

## CONCLUSION

The stock market is one of the most important indicators of economic growth and performance. It is a measure of the health of a country's economy and an important factor in determining the investment climate. The stock market is often seen as a reflection of the confidence that investors have in the future prospects of a country's economy. The performance of the stock market is therefore of great importance to businesses, investors and governments alike.

There are many factors that can influence the performance of the stock exchange, including economic policies, geopolitical events and the behavior of individual investors. One of the key factors that is often cited as having a major impact on the performance of the stock market is the behavior of (FIIs). FIIs are typically large financial institutions such as pension funds, mutual funds and hedge funds that invest in the stock market of a particular country.

There is no doubt that FIIs can have a significant impact on the performance of the stock market. When FIIs invest in a particular market, they bring in large amounts of capital that can have a positive impact on the stock prices of the companies in that market. This is because FIIs are often seen as sophisticated investors who have access to a large amount of information and analysis that can help them make informed investment decisions. As a result, when FIIs invest in a particular market, it is often seen as a positive signal that the market is attractive and has good growth prospects.

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