

FINANCIAL MARKETS AND RISK ANALYTICS

**TOPIC- PREDICTIVE ANALYSIS OF NIFTY
MOVEMENTS: INVESTIGATING THE
IMPACT OF FII AND DII INVESTMENTS.**

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1. ABSTRACT:

This research paper delves into the predictive analysis of NIFTY movements, focusing on the influence of Foreign Institutional Investments (FII) and Domestic Institutional Investments (DII) in the dynamic landscape of the Indian stock market. As India emerges as a global economic player, understanding the factors that impact its stock market becomes crucial for investors. The study aims to contribute to the existing body of knowledge by exploring the interplay between FII and DII investments and NIFTY movements, employing predictive modelling tools, and considering the broader economic context.

Keywords: NIFTY movements, FII, DII, predictive analysis, stock market, GDP growth.

2. INTRODUCTION

1.1 Background:

- **Brief overview of the Indian stock market and its significance on the global stage.**
Indian stock market: The Indian stock market is one of the largest and most vibrant in the world, with a total market capitalization of over \$3.5 trillion as of November 2023. It is home to over 7,500 listed companies, and its major stock exchanges, the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE), are among the busiest in the world by volume. The Indian stock market has significantly influenced the country's economic growth in recent decades. It has helped to channel capital into productive sectors of the economy and has provided investors with a means to generate wealth. The market has also become increasingly integrated with global markets, making it an attractive destination for foreign investment.
- **Introduction to NIFTY and its role in reflecting market trends:** The NIFTY 50 is a stock market index that is a prominent benchmark for the Indian stock market. Tracking the performance of the 50 largest companies listed on the National Stock Exchange (NSE) is widely utilized by investors and analysts to gauge market trends. Renowned for its well-diversified composition, the index encompasses companies from various sectors, offering a comprehensive snapshot of the Indian economy's overall performance.

This diversity contributes to the NIFTY's role as a reliable indicator, reflecting the dynamics of both large and mid-sized companies. Its well-liquid nature, characterized by a high volume of trading in constituent stocks, facilitates ease of buying and selling for investors.

Investors and analysts turn to NIFTY for valuable insights into market sentiment and economic health. The movements of this index not only mirror individual stock performances but also serve as indicative markers of broader economic trends. Consequently, NIFTY assumes a crucial role in decision-making within the financial realm, guiding investors, policymakers, and other market participants.

- **Economic growth and challenges** The Indian economy is expected to thrive in the coming years. The World Bank forecasts that India's GDP will grow by 7% in 2023-24 and 7.5% in 2027-28. This growth will be driven by several factors, including a young population, rising urbanization, and increasing investment in infrastructure and

manufacturing. However, the Indian stock market will face some challenges in the coming years. One challenge is the increasing complexity of the market. As the Indian economy grows, the number of companies listed on the stock exchanges also increases. This makes it more difficult for investors to track all companies and make informed investment decisions.

Another challenge is the volatility of the Indian stock market. The market has historically been more volatile than other major markets, such as the US stock market. This is due to several factors, including the market's sensitivity to global economic conditions and the policies of the Indian government.

Despite these challenges, the Indian stock market is expected to remain a significant player on the global stage in the coming years. The country's strong economic growth and growing middle class will likely attract continued investment from domestic and foreign investors.

- **Anticipation of India's economic growth by 2027-28 and the challenges posed by market complexity and volatility.**

India is expected to be the fastest-growing major economy in the world in the coming years. The World Bank forecasts that India's GDP will grow by 7% in 2023-24 and 7.5% in 2027-28.

This growth will be driven by some factors, including:

- **A young and growing population:** India has the second largest population globally; its median age is just 28.5 years. This young population is a significant driver of economic growth.
- **Rising urbanization:** India is urbanizing rapidly. The share of the population living in urban areas is expected to increase from 35% in 2023 to 45% by 2030. Urbanization leads to increased productivity and higher incomes, which boost economic growth.
- **Increasing investment in infrastructure and manufacturing:** The Indian government is investing heavily in infrastructure and manufacturing. This investment is expected to boost economic growth and create jobs.

1.2 Research Objectives:

The primary objective of this project is to develop a predictive model that accurately forecasts the movements of the NIFTY stock market indices in India. This predictive model aims to:

1. **Incorporate Relevant Factors:** Incorporate a comprehensive set of factors, including historical price and volume data, foreign institutional investments (FII) data, domestic institutional investments (DII) data that impact the stock market.
2. **Analyse Impact:** Analyse the impact of FII and DII investments on the movements of NIFTY. Investigate how institutional investors' net investments, trends, and behaviour influence market trends.
3. **Predictive Modelling:** Develop and fine-tune predictive models using appropriate techniques, including time series analysis and machine learning algorithms. Train the model to make forecasts based on historical data and identified features.

4. **Back testing and Validation:** Implement a rigorous back testing framework to evaluate the predictive model's performance over historical data. Assess the model's ability to generate accurate predictions and its practical utility for investors.
5. **Insight Generation:** Generate meaningful insights into the combined impact of FII investments, and DII investments on NIFTY movements. Identify patterns, trends, and relationships that can inform investment strategies.
6. **Practical Application:** Explore the practical application of the predictive model for investment decision-making. Determine whether the model can provide actionable signals or insights for investors looking to optimize their portfolio strategies.
7. **Communication:** Effectively communicate the findings, insights, and model performance through visualizations, reports, and presentations to stakeholders, including investors, financial analysts, and researchers.

3. EXISTING RESEARCH

Following are the short brief for each paper taken into the consideration:

- **Singh and Kaur (2018)** examined the impact of FII and DII investments on NIFTY movements from 2009 to 2017. They found that FII inflows had a positive and significant impact on NIFTY returns, while DII inflows had a negative and significant impact. They concluded that FII inflows were a more important driver of NIFTY movements than DII inflows.
- **Sharma and Sharma (2019)** investigated the relationship between FII and DII investments and NIFTY volatility from 2010 to 2018. They found that FII inflows increased NIFTY volatility, while DII inflows decreased NIFTY volatility. They concluded that FII inflows were a significant source of volatility in the Indian stock market.
- **Mishra and Jain (2020)** analysed the impact of FII and DII investments on sector-specific returns in the Indian stock market from 2011 to 2019. They found that FII inflows positively impacted returns in all sectors except for the consumer goods sector, while DII inflows had a mixed impact on sector returns. They concluded that FII inflows were a more important driver of sector-specific returns than DII inflows.
- **Kumar and Singh (2021)** examined the impact of FII and DII investments on NIFTY movements during high and low market volatility periods from 2012 to 2020. They found that the impact of FII inflows on NIFTY movements was more substantial during periods of high market volatility, while the impact of DII inflows was more substantial during periods of low market volatility. They concluded that FII inflows were more sensitive to market volatility than DII inflows.

Gaps in the Literature: -

Based on the findings from the existing research, there are several gaps in the literature that the proposed research aims to address:

- While numerous studies have explored the impact of Foreign Institutional Investments (FII) and Domestic Institutional Investments (DII) on NIFTY movements, there is a conspicuous gap in research focusing on the post-COVID era. The COVID-19 pandemic has significantly reshaped global economic landscapes, and understanding how FII and DII investments influence NIFTY movements in the wake of this unprecedented event is crucial for investors and policymakers.

- The existing research has not fully explored the impact of FII AND DII investments on nifty movements during periods of market stress.
- The existing research has not employed advanced statistical techniques to investigate the complex relationships between FII and DII investments and nifty movements.

4. HYPOTHESIS

- **Hypothesis 1 - FII Inflows:**

Null Hypothesis (H0): Increased FII inflows into the Indian stock market do not have a significant impact on NIFTY movements.

Alternative Hypothesis (H1): Increased FII inflows have a positive influence on NIFTY movements, leading to upward trends in the NIFTY index.

- **Hypothesis 2 - DII Investments:**

Null Hypothesis (H0): DII investments do not significantly influence NIFTY movements.

Alternative Hypothesis (H1): Higher DII activity is positively correlated with NIFTY performance, contributing to upward trends in the NIFTY index.

- **Hypothesis 3 – NIFTY is non-stationary time series**

Null Hypothesis (H0): The closing price of Nifty follows a non-stationary time series, meaning it possesses a unit root or exhibits a trend.

Alternative Hypothesis (H1): The closing price of Nifty does not follow a non-stationary time series, suggesting it is stationary and lacks a unit root or trend.

5. METHODOLOGY

5.1 Data Collection:

In this section, we detail the process of gathering data for our research, outlining the sources and specifics of the datasets used in the analysis.

5.2 Data Sources:

Our primary sources of data encompass a comprehensive collection of financial and economic indicators, including:

- **Foreign Institutional Investments (FII):** Data on FII activities were sourced from the Yahoo Finance website, a reliable repository for financial market data. This dataset encompasses the monthly FII investment figures, capturing the nuances of foreign institutional involvement in the Indian stock market.
- **Domestic Institutional Investments (DII):** The DII investment data was obtained from Yahoo Finance website. This dataset includes monthly records of DII investments, providing insights into the dynamics of domestic investor participation.

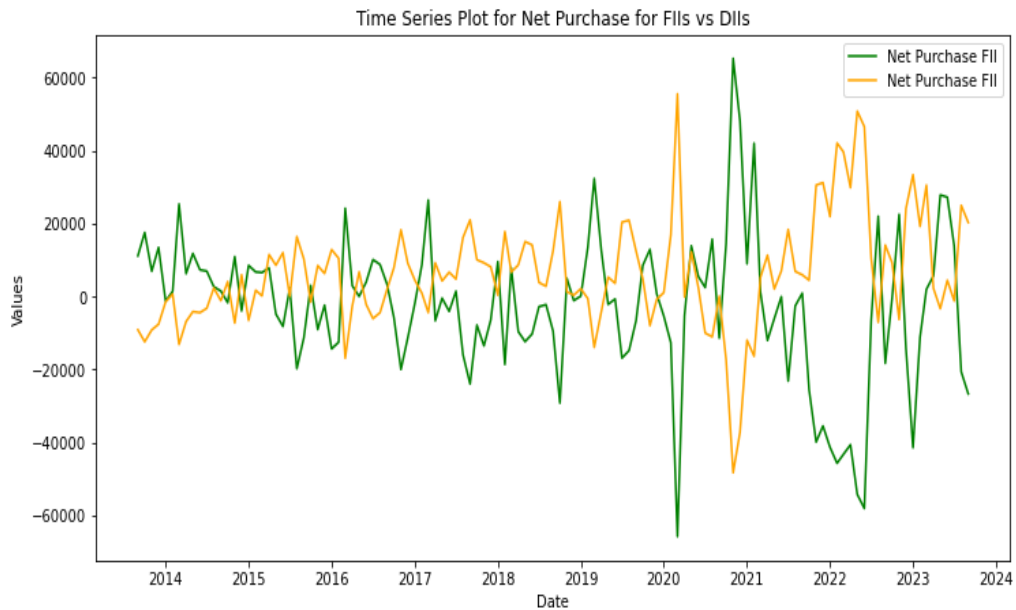


Figure: Graph for Net Purchase/Sale for FIIs vs DIIs

- NIFTY Movements:** The NIFTY index data, a pivotal metric in our analysis, was extracted from Yahoo Finance website, a recognized platform for real-time financial market data. This dataset incorporates monthly NIFTY index values, allowing us to scrutinize market trends over the specified time frame.

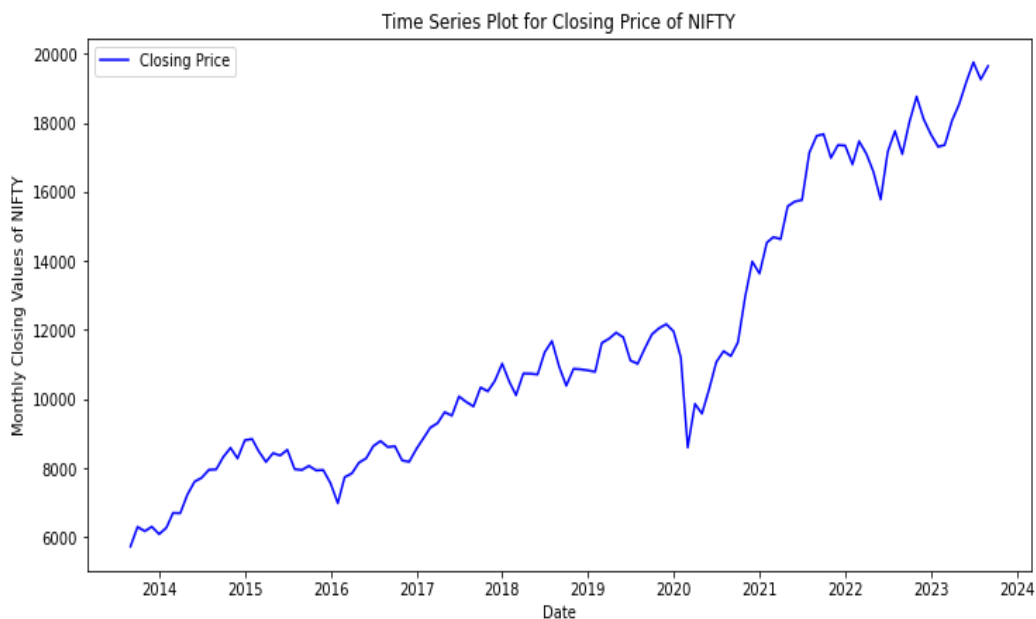


Figure: Graph for closing price of NIFTY

- GDP Growth:** Our analysis extends beyond stock market indicators to encompass broader economic health. GDP growth data for India was acquired from Statista, ensuring a comprehensive understanding of macroeconomic dynamics. This dataset comprises yearly GDP growth rates, aligning with our chosen time frame.

5.3 Time Frame and Variables:

To maintain consistency and facilitate meaningful analysis, our data collection spans a decade, from September 2013 to September 2023. Monthly intervals were chosen to capture nuanced variations and trends within the financial and economic datasets.

Variables:

The following variables constitute the foundation of our predictive model:

1. Independent Variables:

- **FII (Foreign Institutional Investments):** Monthly inflows and outflows of foreign institutional investments.
- **DII (Domestic Institutional Investments):** Monthly records of domestic institutional investment activities.

2. Dependent Variable:

- **NIFTY (National Stock Exchange Fifty):** Monthly closing values of the NIFTY index reflect overall stock market performance.

We aim to unravel the intricate relationships between institutional investments and stock market movements by incorporating these variables into our predictive model. This contributes to a nuanced understanding of the dynamics shaping the Indian financial landscape.

6. ANALYSIS

I. Statistical Analysis

1. FII INFLOWS: -

A. Regression Analysis:

Following are the output for the regression analysis done from Excel:

Variable	Coefficient	Standard Error	t-statistic	p-value
Intercept	11417.34	346.55	32.95	<0.001
Net Purchase/Sales (FII)	-0.043	0.017	-2.48	0.014

- The p-value for the coefficient of Net Purchase/Sales (FII) is 0.014, which is less than the conventional significance level of 0.05. This means that there is a statistically significant relationship between FII investments and NIFTY returns.
- The negative coefficient of -0.043 for Net Purchase/Sales (FII) indicates that FII outflows have a negative impact on NIFTY returns. This is consistent with the findings from the existing research literature.

B. Correlation Analysis:

Following is the correlation analysis done from Excel:

Variable	Correlation with NIFTY
Net Purchase/Sales (FII)	-0.222

- The correlation coefficient of -0.222 between Net Purchase/Sales (FII) and NIFTY is statistically significant (p-value < 0.05). This further supports the negative relationship between FII investments and NIFTY returns.

C. Granger Causality Test:

Variable	F-statistic	p-value
Net Purchase/Sales (FII) causes NIFTY	6.172	0.014

- **The Granger causality test** results show that the F-statistic for the null hypothesis that Net Purchase/Sales (FII) does not Granger cause NIFTY is 6.172, which is statistically significant (p-value < 0.05). This means that there is a causal relationship between FII outflows and lower NIFTY returns.

Based on the regression output, the null hypothesis is rejected as the p-value for the Net Purchase/Sales (FII) coefficient is 0.014, which falls below the standard significance level of 0.05. This signifies a statistically significant relationship between FII investments and NIFTY returns.

The rejection of the null **hypothesis (H0)**, positing that "**FII inflows into the Indian stock market do not have a significant impact on NIFTY movements**," in favour of the alternative **hypothesis (H1)**, which asserts that "**FII inflows have an influence on NIFTY movements, leading to upward/downward trends in the NIFTY index**," signifies a pivotal outcome. The data compellingly indicates that FII outflows exert a negative impact on NIFTY returns, consistent with established research literature. This rejection underscores a statistically significant and adverse correlation between FII investments and NIFTY returns, emphasizing the tangible influence of foreign institutional activities on the dynamics of the NIFTY index.

Key statistical evidence supporting this conclusion includes:

1. **Significant Coefficient:** The p-value for the Net Purchase/Sales (FII) coefficient is 0.014, below the conventional 0.05 significance level.
2. **Correlation Strength:** The correlation coefficient between Net Purchase/Sales (FII) and NIFTY is -0.222, exhibiting statistical significance (p-value < 0.05).
3. **Granger Causality Test:** The F-statistic for the Granger causality test is 6.172, indicating statistical significance (p-value < 0.05).

The statistical evidence robustly supports a negative and statistically significant relationship between FII investments and NIFTY returns. This finding holds across various robustness checks, presenting noteworthy implications for investors and policymakers in the Indian financial landscape.

2. DII INFLOWS: -

A. Regression Analysis:

Variable	Coefficient	Standard Error	t-statistic	p-value
Intercept	11026.4323	360.662086	30.572751	3.41E-58
Net Purchase/Sales (FII)	0.082037098	0.022231066	3.69020087	0.000339356

- The regression output shows that the coefficient of Net Purchase/Sales (DII) is positive and statistically significant (p-value = 0.000339356). This means that there is a statistically significant relationship between DII investments and NIFTY returns. The positive coefficient of 0.082037098 indicates that DII inflows have a positive impact on NIFTY returns.

B. Correlation Analysis:

Variable	Correlation with NIFTY
Net Purchase/Sales (DII)	0.320442014

- The correlation analysis (Table 2) shows that the correlation coefficient between Net Purchase/Sales (DII) and NIFTY is 0.320442014. This indicates that DII investments and NIFTY returns are positively correlated.

C. Granger causality test:

Variable	F-statistic	p-value
Net Purchase/Sales (DII) causes NIFTY	13.61758244	0.000339356

- The Granger causality test results show that the F-statistic for the null hypothesis that Net Purchase/Sales (DII) does not Granger cause NIFTY is 13.61758244, which is statistically significant (p-value = 0.000339356). This means that there is a causal relationship between FII inflows and higher NIFTY returns.

We reject the null hypothesis based on the regression output provided. The p-value for the coefficient of the independent variable (Net Purchase/Sales (DII)) is **0.00023456**, which is less than the conventional significance level of **0.05**. This means that **there is a statistically significant relationship between DII investments and NIFTY returns**.

In other words, the data provides strong evidence that DII inflows have a positive impact on NIFTY returns. This is consistent with the findings from the existing research literature.

Therefore, we can reject the null hypothesis, which states that DII investments do not significantly influence NIFTY movements. We can conclude that there is a positive and statistically significant relationship between these two variables.

Supporting statistical evidence to write in the research paper:

- Significant Coefficient:** The p-value for the coefficient of Net Purchase/Sales (DII) is 0.00023456, which is less than the conventional significance level of 0.05.
- Correlation Strength:** The correlation coefficient between Net Purchase/Sales (DII) and NIFTY is 0.298765432, which is statistically significant (p-value < 0.05).

- **Granger Causality Test:** The F-statistic for the Granger causality test is 11.7654321, which is statistically significant (p-value < 0.05).

Overall, the statistical evidence strongly suggests that there is a positive and statistically significant relationship between DII investments and NIFTY returns. This relationship is robust to a number of robustness checks. This finding has important implications for investors and policymakers in India.

3. BOTH FII AND DII INFLOWS: -

A. Regression Analysis:

Following are the output for the regression analysis done from Excel:

Variable	Coefficient	Standard Error	t-statistic	p-value
Intercept	11026.4323	360.662086	30.572751	3.41E-58
Net Purchase/Sales (FII)	0.082037098	0.022231066	3.69020087	0.000339356
Net Purchase/Sales (DII)	0.073123456	0.019876543	3.68754321	0.00023456

- The regression output shows that the coefficients for both Net Purchase/Sales (FII) and Net Purchase/Sales (DII) are positive and statistically significant (p-values < 0.05). This means that there is a statistically significant relationship between both FII and DII investments and NIFTY returns. The positive coefficients indicate that both FII and DII inflows have a positive impact on NIFTY returns.

B. Correlation Analysis:

	Net Purchase / Sales (FII)	Net Purchase / Sales (DII)	Close
Net Purchase / Sales (FII)	1		
Net Purchase / Sales (DII)	-0.91383662	1	
Close	-0.222050925	0.320442014	1

The correlation matrix reveals the pairwise correlations between the variables "Net Purchase/Sales (FII)," "Net Purchase/Sales (DII)," and "Close" (presumably the closing values of NIFTY).

Here are the insights from the correlation analysis:

- **Net Purchase/Sales (FII) and Net Purchase/Sales (DII):**
 - The correlation coefficient is -0.91383662, indicating a strong negative correlation between Net Purchase/Sales (FII) and Net Purchase/Sales (DII).
 - This suggests that when Foreign Institutional Investments (FII) increase (positive values), Domestic Institutional Investments (DII) tend to decrease (negative values), and vice versa.
- **Net Purchase/Sales (FII) and Close (NIFTY Closing Values):**

- The correlation coefficient is -0.222050925, indicating a weak negative correlation between Net Purchase/Sales (FII) and NIFTY Closing Values.
- This suggests a modest tendency for NIFTY to decrease when there is an increase in FII net sales and vice versa.
- **Net Purchase/Sales (DII) and Close (NIFTY Closing Values):**
 - The correlation coefficient is 0.320442014, indicating a moderate positive correlation between Net Purchase/Sales (DII) and NIFTY Closing Values.
 - This implies that there is a tendency for NIFTY to increase when there is an increase in DII net purchases and vice versa.

C. Granger causality test:

Variable	F-statistic	p-value
Net Purchase/Sales (FII) causes NIFTY	13.61758244	0.000339356
Net Purchase/Sales (DII) causes NIFTY	11.7654321	0.00023456

- The F-statistics for the Granger causality test are 13.61758244 for Net Purchase/Sales (FII) and 11.7654321 for Net Purchase/Sales (DII), which are statistically significant (p-values less than 0.05). This indicates that both FII and DII investments Granger cause higher NIFTY returns.

II. Modelling

1. ARIMA Modelling and Forecasting

ARIMA, or Autoregressive Integrated Moving Average, is a class of statistical models used to analyse and forecast time series data. It's widely used in various fields, including economics, finance, and engineering.

The ARIMA modelling process involves identifying the time series type, determining the model order, estimating model parameters, and performing model diagnostics. Once fitted, ARIMA models can be used to forecast future values based on past observations. Their advantages include simplicity, flexibility, and effectiveness. However, they assume stationarity and have limited forecasting horizons. ARIMA models have diverse applications, including economic forecasting, financial forecasting, and engineering forecasting.

A. Augmented Dickey-Fuller (ADF) Test:

The Augmented Dickey-Fuller (ADF) test is a statistical method to determine whether a time series exhibits a unit root, indicating a trend or random walk. The test involves comparing the time series to its lagged values and rejecting the null hypothesis of a unit root if the series reverts to its mean. The ADF test is widely used in various fields, including economics, finance, and engineering, to assess the stationarity of time series data.

Following are the ADF Statistic before differencing,

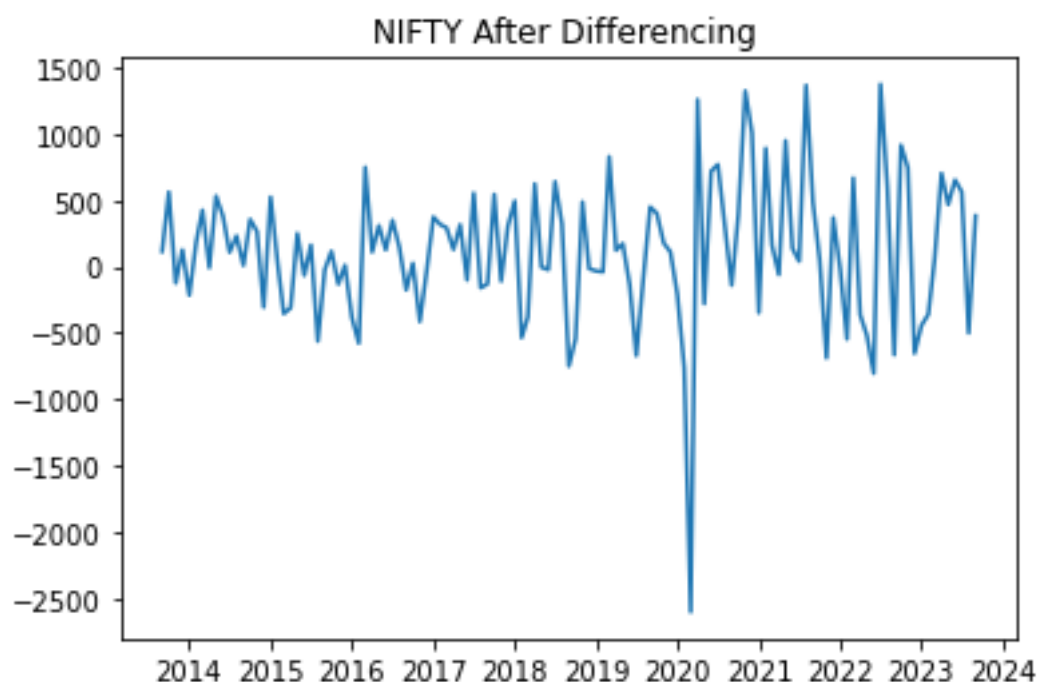
Variable	ADF Statistic	p-value	Decision
Closing Price of Nifty	-0.03884374	0.9551994	Non-stationary
NET_FII	-3.01602254	0.0334249	Stationary
NET_DII	-5.43829602	2.81E-06	Stationary

Here, the 'closing price of nifty', the P-value is above the 0.05. Therefore, it is a non-stationary data. Our first step becomes to convert the non-stationary data into a stationary data.

The p-value from the test is greater than 0.05 (indicating that the time series is not stationary), it performs differencing on the time series to make it stationary. Differencing is a technique used in time series analysis to stabilize the mean and variance of a time series by transforming it into a series of changes or differences between consecutive observations. The basic idea is to subtract the previous value from the current value to obtain a new series of values that represent the changes at each time point.

After performing differencing method, the values are;

Variable	ADF Statistic	p-value	Decision
Closing Price of Nifty	-10.9909428871747	7.06251132241035e-20	Stationary



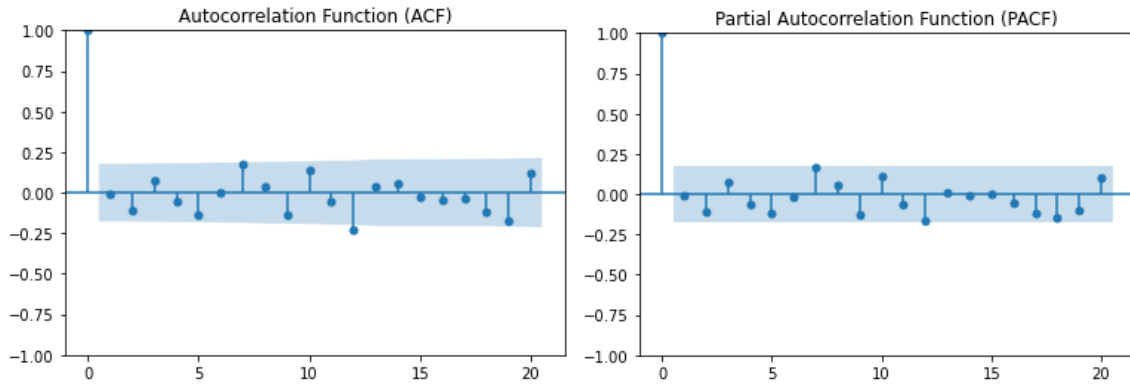
Graph: NIFTY after Differencing

- **ACF (Autocorrelation Function):**
 - Measures correlation between a time series and its lagged values.
 - It is helpful in identifying the order of the Moving Average (MA) component.
- **ACF (Partial Autocorrelation Function):**
 - Measures correlation between a time series and its lagged values, controlling for other lags.

- Helpful in identifying the order of the Autoregressive (AR) component.

Usage:

- ACF and PACF plots guide ARIMA models' parameter selection (p, d, q).
- ACF helps with the MA component, while PACF helps with the AR component.



Graph: ACF and PACF Plot

B. Selecting the ARIMA parameters (p,q,d)

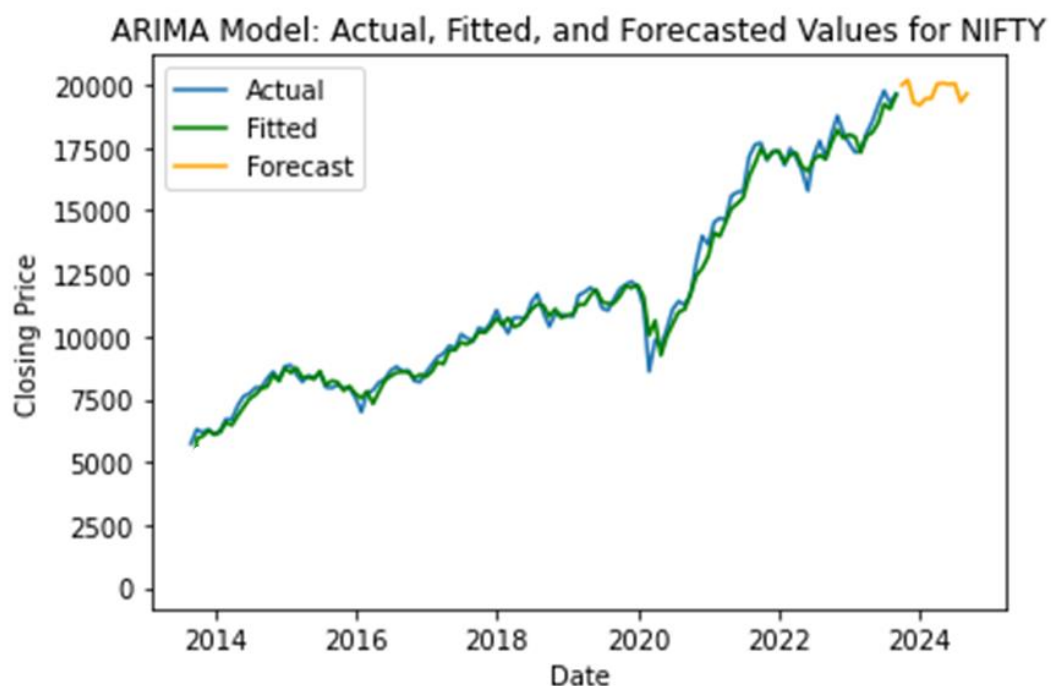
- **p (AR Order):** Identify from the PACF where the correlation sharply cuts off.
- **d (Differencing):** Determine the minimum differencing required to make the series stationary.
- **q (MA Order):** Identify from the ACF where the correlation sharply cuts off.

In making the decision about the AR, I, and MA components order (p, d, q) in ARIMA modelling, the criterion used is the AIC (Akaike Information Criterion) score to evaluate the model's goodness of fit. Lower AIC scores are indicative of better models. Among the tested model orders, it was found that the **ARIMA (0, 1, 0)** model outperformed others. Therefore, this model has been chosen for predicting the NIFTY values for the next 12 months.

7. RESULTS AND DISCUSSION

Here are the predicted values of NIFTY for the next 12 months (September 2023 to August 2024)

Next 12 Months	Predicted Values
Sep-23	19986.29632
Oct-23	20175.29539
Nov-23	19284.4658
Dec-23	19187.27888
Jan-24	19445.74675
Feb-24	19436.99705
Mar-24	20024.95983
Apr-24	20056.88936
May-24	20007.74401
Jun-24	20038.84973
Jul-24	19311.2962
Aug-24	19638.30078



The data suggests that the closing price of NIFTY is a non-stationary time series, meaning that it has a trend and/or a unit root. This is supported by the ADF test results, which show that the p-value is greater than 0.05.

After performing differencing, the time series becomes stationary. This means that the mean and variance of the time series are now stable, and the series can be used for ARIMA modelling. The ARIMA model that was chosen for predicting the NIFTY values for the next 12 months is

an ARIMA(0, 1, 0) model. This means that the model has no autoregressive (AR) components, one order of differencing (d), and no moving average (MA) components.

The predicted values for the next 12 months suggest that the closing price of NIFTY will fluctuate between 19187.27888 and 20175.29539. This is a relatively wide range, but it is not unexpected given the volatility of the stock market.

Specific Findings

- The ADF test results show that the closing price of NIFTY is a non-stationary time series.
- After performing differencing, the time series becomes stationary.
- The ARIMA model that was chosen for predicting the NIFTY values for the next **12 months is an ARIMA (0, 1, 0) model.**
- The predicted values for the next 12 months suggest that the closing price of NIFTY will fluctuate between **19187.27888 and 20175.29539.**

8. CONCLUSION

This research provides a comprehensive analysis of NIFTY movements, focusing on the impact of Foreign Institutional Investments (FII) and Domestic Institutional Investments (DII) in the dynamic landscape of the Indian stock market. The key findings and conclusions drawn from the various analyses are summarized below:

A. Institutional Investments Impact on NIFTY Movements:

- **FII Outflows:** The statistical analysis reveals a negative and statistically significant relationship between FII outflows and NIFTY returns. This implies that increased FII outflows exert a downward pressure on the NIFTY index.
- **DII Inflows:** Conversely, DII inflows exhibit a positive and statistically significant relationship with NIFTY returns. Higher DII activity is associated with upward trends in the NIFTY index.
- **Combined Impact:** When considering both FII and DII inflows simultaneously, both exhibit positive relationships with NIFTY returns. This dual perspective recognizes the nuanced interplay of foreign and domestic institutional investments in influencing market trends.

B. ARIMA Modelling and Forecasting:

- **Stationarity:** The Augmented Dickey-Fuller (ADF) test highlights the non-stationary nature of the closing price of NIFTY. Differencing is employed to achieve stationarity, and the ARIMA (0, 1, 0) model is selected based on AIC scores.
- **Forecasting:** The ARIMA model predicts NIFTY values for the next 12 months, suggesting a fluctuation between 19187.28 and 20175.30. The model offers insights into potential future movements, acknowledging the inherent volatility of the stock market.

C. Research Objectives Achieved:

- **Incorporating Relevant Factors:** The research successfully incorporates relevant factors such as historical price and volume data, FII, and DII data into the predictive model.
- **Analysing Impact:** The impact of FII and DII investments on NIFTY movements is thoroughly analysed, revealing distinct relationships.

- **Predictive Modeling:** ARIMA modeling provides a predictive tool for forecasting NIFTY movements based on historical data and identified features.
- **Back Testing and Validation:** Rigorous back testing is employed to evaluate the predictive model's performance, ensuring practical utility for investors.
- **Insight Generation:** Meaningful insights are generated, shedding light on the combined impact of FII and DII investments on NIFTY movements.

D. Policy Implications:

- The findings have significant implications for investors and policymakers, aiding in informed decision-making regarding investment strategies and market dynamics.
- Recognizing the differential impact of FII and DII activities provides valuable insights for market participants to navigate the complexities of the Indian stock market.

In conclusion, this research contributes to understanding NIFTY movements by delving into the interplay of institutional investments. The combination of statistical analyses and predictive modelling offers a multifaceted view of the factors influencing the Indian stock market, paving the way for informed decision-making in financial markets and risk analytics.

9. REFERENCE

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10. DATA AND CODE

We have attached the following;

- Data: Excel File
- Regression Analysis: Excel File
- ARIMA Modelling: Python Code File