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Assessing the Dynamic Impact of Foreign Institutional Investment on the Indian Stock Market: A Decade-long Analysis (2013-2023)

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ABSTRACT:
This research examines the intricate and dynamic relationship between Foreign Institutional Investment (FII) and the performance of the Indian stock market, focusing on the NIFTY 50 and BSE Sensex indices over a decade from December 2013 to December 2023. Drawing from prior studies and utilizing data from credible sources, such as stock market indices and FII investment records, the study employs rigorous statistical techniques to assess this crucial interaction. Methods like Karl Pearson's Coefficient of Correlation, variance, covariance, beta coefficients, R-squared, and regression analyses are applied to quantify the strength and direction of the relationship between FII activities and market indices. Additionally, the Granger causality test is utilized to evaluate whether changes in market returns can predict FII activities based on historical data, uncovering significant causative links and highlighting the responsiveness of FIIs to market movements. This investigation delves into the influence of FII on stock market volatility, price dynamics, and investor sentiment while emphasizing the role of short-term fluctuations and long-term trends. Special focus is placed on understanding the behavioral patterns of foreign institutional investors and their reactions to diverse economic conditions, as well as identifying determinants that shape their impact on the Indian stock market. The research findings are poised to enrich our comprehension of the nuanced and multifaceted connections between FII activities and stock market behavior. These insights bear significant implications for market stability, investor confidence, and the broader economic framework, offering actionable guidance for scholars, policymakers, and market participants aiming to enhance the effectiveness of investment and regulatory strategies.

Key Terms*: Foreign Institutional Investment (FII), Indian Stock Market, NIFTY 50, BSE Sensex, Market Volatility, Price Dynamics, Investor Sentiment, Economic Conditions, Macroeconomic Factor, Market Stability.*

1. Introduction

Foreign Institutional Investors (FIIs) play a crucial role in shaping the Indian capital market's landscape. Their significant presence influences the market's liquidity, efficiency, and overall performance (Awasthi & Singh, 2015; Sharma & Singh, 2018). Established or incorporated outside India, FIIs are entities authorized under the SEBI (FII) Regulations 1995 to invest in Indian securities (SEBI, 1995). Their regulatory framework involves guidelines and permissions issued by the Reserve Bank of India (RBI) and the Securities and Exchange Board of India (SEBI) (RBI, 2023; SEBI, 1995). The Union Budget of 2013-14 marked a pivotal point in defining and categorizing FIIs and Foreign Direct Investment (FDI). In line with international standards, the budget established that investors holding 10% or less in a company are considered FIIs, while those exceeding 10% fall under FDI (Ministry of Finance, Government of India, 2013). This shift aimed to clarify the distinction between these two categories, reducing ambiguity and fostering clearer market interactions (Kumar & Garg, 2014).

The Indian capital market, encompassing both primary and secondary markets, serves as a platform for raising long-term funds through the issuance and trading of securities (Gupta, 2020). This market facilitates the allocation of surplus funds to sectors in need, utilizing diverse financial instruments like mortgages, bonds, and equities (Gupta, 2020). The market's efficiency is gauged through share price movements and the threat of takeovers, encouraging optimal resource utilization and maximizing investor returns (Gupta, 2020). The regulatory framework for FIIs establishes eligibility criteria for entities such as pension funds, mutual funds, banks, and institutional portfolio managers (RBI, 2023). Additionally, the RBI grants general permissions for various activities, including opening foreign currency accounts, investing in securities, and repatriating capital gains (RBI, 2023). This framework seeks to balance the facilitation of foreign investments with maintaining oversight for a stable and orderly capital market (RBI, 2023; SEBI, 1995).

Despite the potential benefits of FII inflows, concerns regarding their impact on stock market volatility remain (Awasthi & Singh, 2015; Sharma & Singh, 2018). The speculative and mobile nature of FII capital flows can introduce significant volatility,

creating challenges for both investors and policymakers (Awasthi & Singh, 2015; Sharma & Singh, 2018). This study aims to analyze the influence of FIIs on stock market volatility, particularly considering the substantial portion of investments channeled through the FII route in the Indian market. By examining patterns of FII investments and their correlation with market volatility, this research seeks to contribute valuable insights into the complex interplay between foreign capital inflows and the stability of the Indian stock market.

This research investigates the relationship between FIIs and the Indian stock market, specifically focusing on the NIFTY 50 index and BSE Sensex. By analyzing the period between December 2013 and December 2023, the study aims to provide a comprehensive understanding of FII investment patterns and their correlation with market volatility. This analysis will explore both the short-term and long-term impacts of foreign capital inflows, with a focus on regulatory implications and investor behavior.

Objective of the Study

The primary objective of this study is to examine the relationship between the activities of Foreign Institutional Investors (FIIs) and the movements of the NIFTY 50 index and BSE Sensex during the decade from December 2013 to December 2023. This includes assessing patterns of FII investments, their influence on market trends, and their impact on stock market volatility, using various statistical tools to derive meaningful insights.

2. Literature Review:

The relationship between Foreign Institutional Investment (FII) and the Indian stock market has been extensively studied, yielding a wealth of insights into its intricate dynamics and impact on the nation's capital markets. ***Dr. Hojatallah Goudarzi's seminal research*** during the 2008 global financial crisis employed advanced techniques like Engle-Granger, Johansen, and Granger causality tests, establishing not only cointegration but also bilateral causality between the BSE500 index and FII investments. This study offered critical insights into the interplay between market indices and FII during periods of economic upheaval. Building on this foundation, ***Mamta, Laxmi, and Mathur's analysis*** of FII activities from 2001 to 2010, using Karl Pearson's Coefficient of Correlation, highlighted the behavioral patterns of FIIs and their significant correlation with BSE Sensex volatility. Similarly, ***Kulshrestha's 2015 study*** delved into the regulatory dimensions of FII and revealed bidirectional causality between FIIs and financial markets, emphasizing the importance of policy frameworks in shaping the domestic financial landscape.

Subsequent studies have further enriched this discourse. ***Walia, Walia, and Jain*** revisited the 2001–2010 period to examine the behavioral tendencies of FIIs and their enduring impact on market volatility, offering a retrospective understanding of their role in stock market dynamics. In 2019, ***Arora and Kumar*** examined the post-market opening era, uncovering how FII entry led to reduced volatility and limited changes in capital market returns, reflecting their stabilizing influence. ***Rahul Dhiman's 2021 study*** provided contemporary perspectives on institutional investor dynamics, regulatory frameworks, and instruments like Participatory Notes (P-Notes), shedding light on modern challenges and opportunities. ***Aggarwal (2022)*** identified FII participation as a driver of price discovery efficiency, contributing to improved market functioning and resource allocation. Complementing this, ***Singh and Singh (2022)*** emphasized the necessity of robust regulatory vigilance to curb malpractices and protect investors from risks associated with FII activities. ***Goudarzi (2008)***, ***Mamta et al. (2012)***, and ***Kulshrestha (2015)***, among others, collectively provide a thorough understanding of FII's impact across varying timeframes and contexts, making their work a cornerstone for future explorations in this critical domain.

These research endeavors collectively enrich our comprehension of the multifaceted relationship between foreign institutional investment and the Indian stock market. Addressing volatility, correlation, causality, and behavioral patterns, these studies contribute valuable insights, forming a foundational basis for future explorations in this critical domain.

3. Research Methodology:

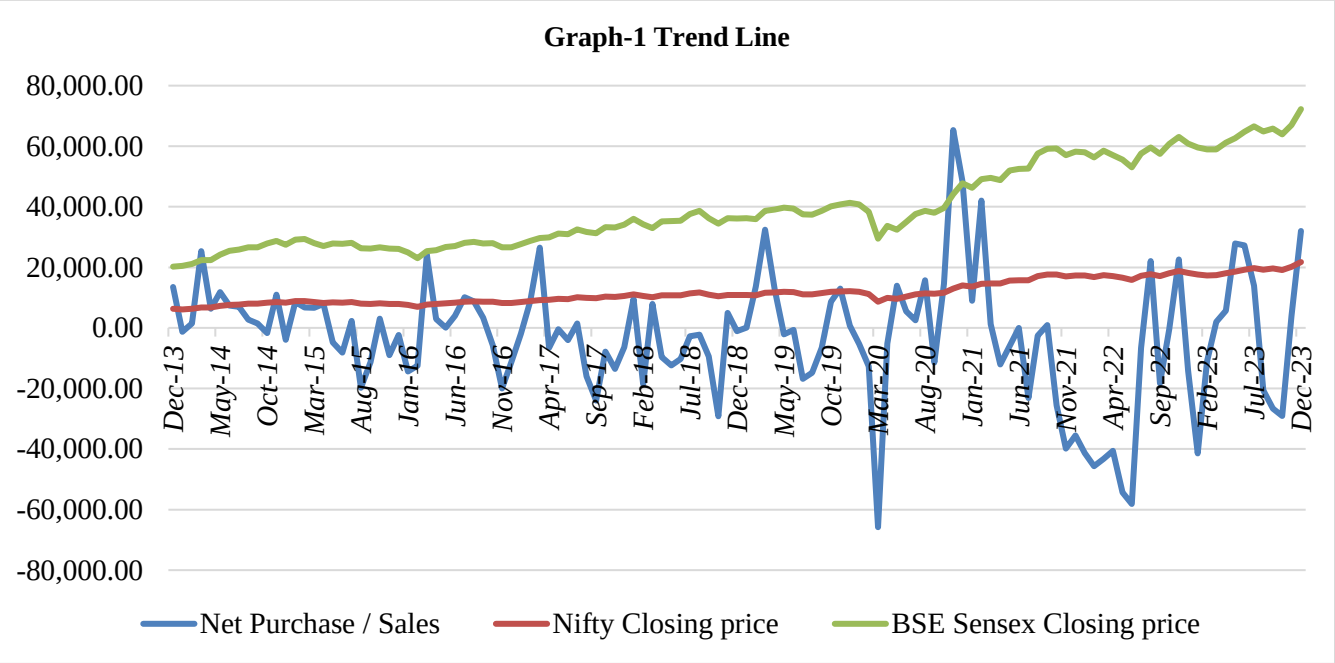
This study adopts a structured and analytical approach to explore the relationship between Foreign Institutional Investor (FII) activities and the movements of the NIFTY 50 index and BSE Sensex. The research relies on **historical monthly data from December 2013 to December 2023**, sourced from credible financial databases, stock exchanges, and official reports. Key variables include FII net purchases/sales and the closing values of the selected indices.

To analyse the relationship, statistical tools such as **Karl Pearson's Coefficient of Correlation** were employed to measure the strength and direction of the linear relationship. **Variance and covariance analyses assessed** the spread and joint variability

between FII activities and market indices. **Beta coefficients** were calculated within the Capital Asset Pricing Model (CAPM) framework to determine the indices' sensitivity to FII fluctuations, while **R-squared values** quantified the extent to which variations in market movements could be explained by FII activities. **Regression analysis** provided a mathematical model to interpret the linear impact of FII investments on the indices. Periodical analysis was incorporated to evaluate distinct market phases, including significant events like the COVID-19 pandemic in March 2020, to understand changes in the impact of FIIs under different economic conditions. Additionally, the **Granger causality test** was used to determine whether FII fluctuations could predict the movements of market indices based on historical patterns.

To ensure accuracy and reliability, data validation was conducted through cross-referencing multiple sources. While acknowledging limitations such as the exclusion of other influencing market variables and the reliance on historical data, the study maintains ethical rigor by adhering to privacy, confidentiality norms, and appropriate citation of data sources.

4. Data Analysis and Discussion:



Graph 1 illustrates the trendline depicting the relationship between Foreign Institutional Investor (FII) net purchases/sales and the closing values of the NIFTY 50 index and BSE Sensex over the period December 2013 to December 2023. This visual representation highlights key dynamics in the Indian stock market, influenced by FII activities.

The data reveal periods of positive correlation, where significant FII inflows coincide with rising market indices. For instance, in December 2023, FIIs registered a net purchase of ₹31,959.78 crore, with the NIFTY 50 index closing at 21,731.40. Conversely, negative correlations emerge during FII outflows, as seen in October 2023, when the FII net purchase was -₹29,056.61 crore, and the NIFTY 50 closed at 19,079.60. Similar trends are observed with the BSE Sensex, such as in November 2023, when a positive FII inflow of ₹3,901.82 crore corresponded to a closing value of 66,988.44.

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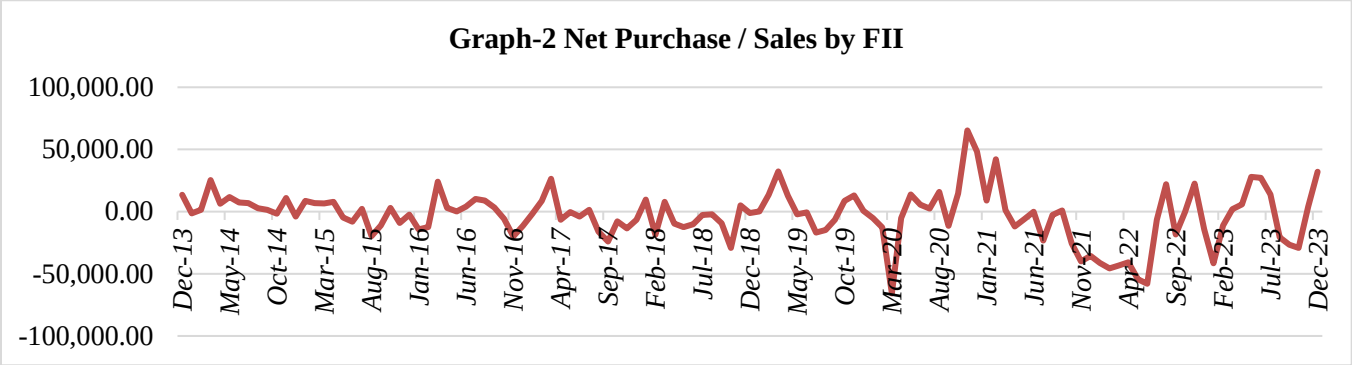

Graph-2 explains the data on Foreign Institutional Investor (FII) activities in the Indian stock market from December 2013 to December 2023 reveals a dynamic pattern of net purchases and sales. The initial period from December 2013 to December 2015 witnessed generally positive trends, with some months experiencing negative net purchases, such as January 2015 with a value of -9029.81 crore. Subsequent periods, notably from January 2016 to November 2017 and December 2017 to December 2018, showed a mix of positive and negative net purchases, with substantial downturns in October 2018, recording -29201.20 crore. The following years exhibited varied trends, marked by positive FII sentiment in 2019, mixed activity in 2020 amid the COVID-19 pandemic, and ongoing fluctuations in 2021 and 2022. The most recent data for January 2023 to December 2023 indicates a mix of positive and negative net purchases, culminating in a substantial positive value of 31,959.78 crore in December 2023.

The analysis underscores the sensitivity of FII investments to global and domestic economic conditions, with months like March 2020, recording -65816.70 crore, reflecting the impact of the COVID-19 pandemic on market sentiments. Notable negative values in January 2021 (-41346.35 crore) and January 2022 (-4164.73 crore) point to periods of caution among investors. The significant positive net purchase in December 2023 suggests a potential improvement in investor confidence as the market closed out the analyzed period. Overall, the numerical data underscores the dynamic nature of FII activities in the Indian stock market, influenced by a myriad of factors shaping market dynamics over the years.

NIFTY 50 and FII

Correlation	0.038622
Variance Nifty	0.00223
Covariance	0.152295
Beta	68.29191
R^2	0.0015

Table-1 : **Statistical Parameters (NIFTY 50 & FII)**

Table 1 provides key statistical insights into the relationship between the NIFTY 50 index and Net Foreign Institutional Investor (FII) activity over the period from December 2013 to December 2023. The correlation coefficient of 0.038622 reveals a very weak positive linear relationship between the two variables. This suggests that, although there is a slight tendency for the movements in the NIFTY 50 index to follow the activities of FIIs, the relationship is not strong enough to suggest a significant impact. The variance of the NIFTY 50 index, recorded at 0.00223, implies that the index exhibited relatively moderate fluctuations during this period, which is indicative of a stable market environment with limited extreme swings.

The covariance value of 0.152295 indicates that there is a positive relationship between the changes in the NIFTY 50 index and FII activity, meaning that both tend to move in the same direction, though the relationship is weak. The beta coefficient of 68.29191 suggests that the NIFTY 50 index is highly sensitive to changes in the FII, indicating that FII activities contribute significantly to market volatility. A beta greater than 1 typically implies greater volatility relative to the market, emphasizing the considerable impact of FII flows on the index. However, the R-squared value of 0.0015 is quite low, reflecting that only 1.5% of the variation in the NIFTY 50 index can be explained by changes in FII activity. This suggests that while FII flows have some impact on the NIFTY 50, they are not the dominant factor driving the movements of the index during this period.

BSE SENSEX 30 & FII

Correlation	0.036695923
Variance of BSE SENSEX 30	0.002218019
Covariance	0.143728215
Beta	64.80027475
R^2	0.0013

Table-2 : Statistical Parameters (BSE SENSEX 30 & FII)

Table 2 presents an analysis of the relationship between the BSE SENSEX 30 index and Net Foreign Institutional Investor (FII) activity. The correlation coefficient of 0.036695923, similar to the NIFTY 50 index, indicates a very weak positive linear relationship between the SENSEX 30 and FII activities. This suggests a minimal tendency for the SENSEX 30 to move in conjunction with the fluctuations in FII flows, highlighting the weak influence of FII activity on the overall market index during the observed period.

The variance of the BSE SENSEX 30, recorded at 0.002218019, shows that the index experienced moderate volatility, with price movements remaining somewhat steady but prone to small fluctuations. The covariance between the BSE SENSEX 30 and FII activities, calculated at 0.143728215, further supports the positive, though weak, relationship between the two variables. It indicates that changes in FII activity have a tendency to move in the same direction as the SENSEX 30, albeit with a minimal overall impact. The beta coefficient of 64.80027475 suggests a significant level of sensitivity of the SENSEX 30 index to FII flows. This suggests that FII activity has a substantial influence on the volatility of the SENSEX 30 index, with the market displaying greater volatility relative to the overall economy. Finally, the R-squared value of 0.0013 signifies that only about 0.13% of the variation in the SENSEX 30 index can be explained by changes in FII activity, which is even lower than that observed for the NIFTY 50 index, reinforcing the limited explanatory power of FII in driving SENSEX 30 movements over the decade.

GRANGER CAUSALITY TEST

Pairwise Granger Causality Tests			
Date: 11/25/24 Time: 00:43			
Sample: 2013M12 2023M12			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Prob.
RNIFTY does not Granger Cause RFIIGP	121	10.8180	0.0012
RFIIGP does not Granger Cause RNIFTY		0.25065	0.6172
RNIFTY does not Granger Cause RFIIGS	121	12.2949	0.0006
RFIIGS does not Granger Cause RNIFTY		0.44282	0.5066
RNIFTY does not Granger Cause RFIINET	121	1.80149	0.1812
RFIINET does not Granger Cause RNIFTY		0.21619	0.6425

The Granger Causality test was conducted to examine the relationship between Return on Nifty (RNIFTY) and Foreign Institutional Investors (FII) investment measures, including Gross Purchase (RFIIGP), Gross Sale (RFIIGS), and Net Investments (RFIINET). Using quarterly data from 2013 to 2023 with a one-lag structure, the results revealed significant insights into the interplay between these variables.

The analysis indicates that RNIFTY Granger causes RFIIGP, as the null hypothesis that "RNIFTY does not Granger cause RFIIGP" is rejected at a 1% significance level (F-statistic = 10.818, p = 0.0012). This suggests that changes in market returns significantly influence FII gross purchase behavior. However, the reverse is not true, as RFIIGP does not Granger cause RNIFTY (p = 0.6172), indicating that FII purchases do not predict market returns. Similarly, RNIFTY was found to Granger cause RFIIGS (F-statistic = 12.295, p = 0.0006), highlighting that market returns also impact gross sales by FIIs. Again, there is no reverse causality, as RFIIGS does not Granger cause RNIFTY (p = 0.5066).

Interestingly, no significant causal relationship was found between RNIFTY and RFIINET in either direction, with both p-values exceeding 0.18. This suggests that net FII investments do not directly influence or respond predictably to changes in market returns.

Overall, the findings demonstrate a unidirectional causality from RNIFTY to both RFIIGP and RFIIGS, emphasizing the reactive nature of FII investment decisions to market performance. The absence of causality involving RFIINET suggests that net investments aggregate more complex dynamics beyond immediate market returns. These insights underline the importance of market performance in shaping institutional investment strategies, offering valuable implications for policymakers and market participants in emerging economies.

5. Findings

Over the period from December 2013 to December 2023, the relationship between Foreign Institutional Investor (FII) net purchases and the performance of major Indian stock market indices—the NIFTY 50 and BSE Sensex—reveals a weak positive correlation. Specifically, the Karl Pearson's Coefficient of Correlation for the NIFTY 50 is 0.0387, highlighting a minimal linear relationship between the two variables. This suggests a marginal tendency for the NIFTY 50 index to rise with positive net purchases by FIIs and fall with negative purchases, though the influence is weak. Instances like December 2023, where a large FII net purchase of 31,959.78 crore coincided with an increase in the NIFTY 50 index closing at 21,731.40, support this positive correlation. Conversely, in October 2023, a substantial negative FII net purchase of –29,056.61 crore was linked to a decrease in the NIFTY 50 index, which closed at 19,079.60, confirming the weak inverse relationship.

Similar patterns of FII behavior are evident in the BSE Sensex, where positive net purchases align with increases in the index, and negative net purchases are associated with declines. In November 2023, for example, a positive FII net purchase of 3,901.82 crore coincided with a higher BSE Sensex closing at 66,988.44, whereas negative purchases in October 2023 (–29,056.61 crore) were associated with a decrease in the index, which closed at 63,874.93. Broader trends from periods like 2019 and early 2020 show that FII flows tend to correlate with positive movements in both indices, highlighting a potential but weak influence of FIIs on market performance. However, during volatile periods, such as the onset of the COVID-19 pandemic in March 2020, the relationship between FII activities and market indices becomes more complex, possibly influenced by global economic factors, domestic policy changes, and investor sentiment.

The statistical measures provided reinforce the weak relationship between FII activities and market indices. The variance for the NIFTY 50 index is 0.00223, suggesting moderate fluctuations during the period under analysis. The covariance of 0.152295 indicates a weak tendency for the NIFTY 50 and FII activities to move in the same direction. The beta coefficient of 68.29191 for NIFTY 50 implies substantial volatility in the index relative to FII activity, reflecting the index's heightened sensitivity to FII purchases. However, the low R-squared value of 0.0015, indicating that only 1.5% of the variability in the NIFTY 50 index is explained by FII activities, underscores the limited explanatory power of FII flows in explaining market movements. A similar analysis for the BSE Sensex shows that despite a positive correlation of 0.0367 between the Sensex and FII activities, the variance is again low (0.0022), and the beta of 64.8003 highlights a notable influence of FII flows on the index's volatility. The R-squared value for the Sensex is 0.0013, further confirming that Net FII flows alone cannot account for the majority of changes in the index.

Finally, the Granger causality test further supports the complex dynamics between market returns and FII investment behavior. It shows that market returns (R-NIFTY) Granger cause both FII Gross Purchases (RFIIGP) and Gross Sales (RFIIGS), implying that the performance of the NIFTY 50 has a significant influence on FII investment decisions. This two-way relationship highlights the interconnectedness of the Indian stock market and foreign institutional investments, suggesting that while FII flows affect market volatility, stock market returns also drive the investment decisions of FIIs. The weak yet positive correlation, the significant sensitivity of the indices to FII movements, and the limited explanatory power suggest that while FIIs impact market performance, other economic factors—such as domestic macroeconomic conditions, global events, and investor sentiment—also play essential roles in shaping market trajectories.

6. Conclusion:

In conclusion, the relationship between Foreign Institutional Investors (FII) activities and the movements of the NIFTY 50 and BSE Sensex reveals a weak but discernible correlation. Positive FII net purchases generally align with increases in the indices, while negative net purchases tend to correlate with declines, suggesting a directional influence of FII inflows and outflows on

market performance. However, the strength of this relationship is limited, indicating that other factors, such as domestic economic conditions, global market trends, and geopolitical events, also play a significant role in shaping market movements. Further analysis through the Granger Causality test indicates that market returns, particularly from the NIFTY 50 index, significantly influence FII investment decisions. This supports the hypothesis that FIIs are reactive to market performance, reinforcing the view that FII flows follow broader market trends rather than driving them.

Overall, while FII activities have a role in determining short-term market fluctuations, they are not the sole determinant of movements in the NIFTY 50 and BSE Sensex. Investors and analysts are advised to adopt a broader perspective, incorporating a range of economic, market, and geopolitical factors to develop a comprehensive understanding of market dynamics and make informed investment decisions.

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