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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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# A Study on Stock Market Volatility and FII/DII Flows in context of the National Stock Exchange (NSE), 2015–2025

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**ABSTRACT:** Stock market volatility plays a crucial role in shaping investor sentiment, capital allocation, and financial market stability. In emerging economies like India, institutional investors—Foreign Institutional Investors (FIIs) and Domestic Institutional Investors (DIIs)—significantly influence market movements. This study examines the relationship between stock market volatility and FII/DII flows at the National Stock Exchange (NSE) over 2015–2025. Using secondary data from NSE, SEBI, and NSDL, the study employs descriptive statistics, correlation analysis, and OLS regression to assess dynamic interactions between variables. The analysis spans major economic events including demonetization (2016), GST implementation (2017), the COVID-19 pandemic (2020), and subsequent global monetary tightening. Findings reveal that FII flows have a strong, statistically significant positive impact on stock market returns ( $p$ -value =  $2.20E-45$ ), while DII flows exhibit a smaller but significant positive effect ( $p = 0.0112$ ). The correlation matrix shows a moderate negative correlation between FII and DII flows ( $r = -0.533$ ), confirming a counterbalancing dynamic. A comparative pre- and post-COVID analysis reveals structural shifts in institutional behavior. The results offer actionable insights for investors, policymakers, and financial analysts regarding capital flow dynamics and market stability.

**KEYWORDS:** Stock Market Volatility, Foreign Institutional Investors (FII), Domestic Institutional Investors (DII), National Stock Exchange (NSE), Institutional Investment Flows, Emerging Markets.

### I. INTRODUCTION

The stock market is a critical component of a country's financial system, facilitating capital formation, wealth creation, and efficient allocation of resources. In India, the National Stock Exchange (NSE)—one of the largest exchanges in the world—serves as a central barometer of economic performance. A defining feature of markets in emerging economies like India is volatility: rapid variation in stock prices that reflects market risk and uncertainty. High volatility is associated with economic shocks, geopolitical tensions, and policy disruptions, and can undermine investor confidence when excessive.

Between 2015 and 2025, the Indian market navigated demonetization (2016), GST reforms (2017), the COVID-19 pandemic (2020), and global monetary tightening—events that profoundly shaped investor behavior. Among market participants, Foreign Institutional Investors (FIIs) and Domestic Institutional Investors (DIIs) exert dominant influence. FIIs, driven by global economic conditions and risk sentiment, tend to generate sudden inflows or outflows that amplify volatility. DIIs—comprising mutual funds, insurance companies, and financial institutions—typically adopt longer investment horizons and act as counterbalancing forces during FII-driven market stress.

Understanding the interplay between institutional flows and volatility is essential for investors (portfolio allocation and risk management), regulators (SEBI's market stability mandate), and academics (market efficiency in emerging economies). While prior literature has examined FII or DII behavior in isolation, there remains a shortage of comprehensive studies covering recent events, advanced econometric methods, and the combined FII-DII dynamic. This paper addresses these gaps using daily NSE data from 2015 to 2025.



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### II. LITERATURE REVIEW

A rich body of work has explored how institutional flows interact with equity market behavior. Bekaert and Harvey (1997) demonstrated that foreign capital participation in emerging markets enhances liquidity but may increase volatility due to rapid capital mobility. In the Indian context, Rai and Bhanumurthy (2004) applied VAR models to monthly NSE data and found that FIIs respond strongly to stock market performance and global trends, with sudden capital movements elevating volatility. Chakrabarti (2001) confirmed a positive correlation between FII flows and stock returns while cautioning that excessive foreign capital dependence exposes emerging markets to external shocks.

Bansal and Pasricha (2009) established a strong positive relationship between FII inflows and NSE returns using regression analysis, concluding that FIIs significantly influence short-term equity volatility. Kumar and Dhankar (2010) extended this to a bidirectional Granger-causal relationship, suggesting that FIIs both influence and are influenced by market trends. Tripathi and Kumar (2015) were among the first to jointly analyze FII and DII flows, finding FIIs to have a stronger short-term volatility impact while DIIs provide consistent domestic liquidity.

Dash and Suman (2013) employed GARCH models to show that large FII flow fluctuations amplify volatility, while DIIs counterbalance these effects. Sehgal and Garg (2012) corroborated the stabilizing role of domestic institutions using daily exchange data. Narayan, Zhang, and Zheng (2010) extended this analysis to cross-market evidence, finding that foreign investment increases sensitivity to global shocks and stressing the importance of robust domestic institutional participation. Choe, Kho, and Stulz (1999) further noted that foreign investors do not inherently destabilize markets but may intensify volatility during financial crises. Griffin, Nardari, and Stulz (2004) observed that foreign investors react quickly to global signals, amplifying market sensitivity to international shocks. Collectively, the literature establishes that FIIs are procyclical and contribute to short-term volatility, while DIIs are counter-cyclical and stabilizing. However, most prior studies rely on shorter or older time series, exclude post-2020 market dynamics, and employ basic statistical tools that miss volatility clustering and structural breaks. This study bridges these gaps by covering 2015–2025 and incorporating a pre- and post-COVID comparative framework.

### III. METHODOLOGY

#### 3.1 Data Sources and Sample

The study uses secondary daily data spanning January 2015 to December 2025 obtained from (i) the National Stock Exchange (NSE) for Nifty 50 index closing prices and DII flows; (ii) the National Securities Depository Limited (NSDL) for FII net investment data; (iii) Securities and Exchange Board of India (SEBI) for regulatory and institutional activity reports; and (iv) AWS Capitaline database for corroboration of market data. The sample covers approximately 2,500 trading sessions, providing a large and robust dataset that spans multiple economic cycles and major macro events.

#### 3.2 Variables

**Stock Market Volatility (Dependent Variable):** Measured as the daily percentage return of the Nifty 50 index [ $R_t = (P_t - P_{t-1})/P_{t-1} \times 100$ ]. Daily returns serve as a widely accepted proxy for market volatility in high-frequency financial research.

**FII Flows (Independent Variable):** Net daily investment by foreign institutional investors in Indian equities (purchases minus sales), measured in Indian Rupees Crores, sourced from NSDL.

**DII Flows (Independent Variable):** Net daily investment by domestic institutional investors (mutual funds, insurance companies, banks) in Indian equities, measured in Indian Rupees Crores, sourced from NSE.

#### 3.3 Econometric Model and Hypotheses

The following Ordinary Least Squares (OLS) regression model is estimated:

$$\text{Volatility}_t = \beta_0 + \beta_1(\text{FII Flow}_t) + \beta_2(\text{DII Flow}_t) + \epsilon_t$$

Where  $\beta_0$  is the intercept,  $\beta_1$  and  $\beta_2$  are slope coefficients for FII and DII flows respectively, and  $\epsilon_t$  is the error term. Two null hypotheses are tested:  $H_{01}$ : FII flows have no significant impact on stock market volatility;  $H_{02}$ : DII flows have no significant impact on stock market volatility. Both are tested at a 5% significance level using p-values from OLS regression output. Descriptive statistics and Pearson correlation analysis are performed as preliminary analyses.



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### IV. EXPERIMENTAL RESULTS

#### 4.1 Descriptive Statistics

Table 1 summarizes the descriptive statistics for the three variables over the full study period (2015–2025). The mean daily Nifty return is 0.00047, consistent with the low average returns typical in financial markets. The standard deviation of 0.01020 reflects moderate volatility, while the minimum (−0.12980) and maximum (0.08763) returns indicate significant tail events, particularly during the COVID-19 market crash (March 2020). The high kurtosis of 17.896 and negative skewness of −1.064 confirm fat tails and a higher frequency of large negative returns—classic features of equity market distributions.

FII flows averaged −118.89 crores per day, indicating net outflows on average over the decade—particularly driven by post-2020 selling. Standard deviation of 2,285.21 crores reflects substantial variability, with values ranging from −15,525.35 to +17,122.74 crores. DII flows averaged +781.64 crores per day (net buyers), with a standard deviation of 1,801.89 crores—confirming consistent domestic support. DII flows ranged from −6,907.97 to +13,245.12 crores. Both institutional series show high kurtosis (FII: 8.68; DII: 6.52) and positive skew, indicating episodic large inflows.

**Table 1: Descriptive Statistics (2015–2025)**

Nifty Returns: Mean=0.00047, SD=0.01020, Min=−0.12980, Max=0.08763, Skewness=−1.064, Kurtosis=17.896 | FII Flows (₹Cr): Mean=−118.89, SD=2285.21, Min=−15525.35, Max=17122.74, Skewness=0.46, Kurtosis=8.68 | DII Flows (₹Cr): Mean=781.64, SD=1801.89, Min=−6907.97, Max=13245.12, Skewness=1.75, Kurtosis=6.52

#### 4.2 Correlation Analysis

Table 2 presents the Pearson correlation matrix. FII flows and Nifty returns exhibit a positive but weak correlation ( $r = 0.283$ ), indicating that increases in foreign inflows are generally associated with higher returns, consistent with procyclical FII behavior. DII flows and Nifty returns show a weak negative correlation ( $r = -0.112$ ), reflecting the counter-cyclical pattern where domestic investors increase purchases during market declines. Critically, FII and DII flows are negatively correlated at  $r = -0.533$  (moderate strength), confirming the well-documented counterbalancing dynamic: when FIIs sell, DIIs absorb.

**Table 2: Pearson Correlation Matrix**

Nifty Returns vs. FII Flows:  $r = 0.283$  (positive, weak) | Nifty Returns vs. DII Flows:  $r = -0.112$  (negative, weak) | FII Flows vs. DII Flows:  $r = -0.533$  (negative, moderate)

#### 4.3 Regression Analysis and Hypothesis Testing

OLS regression results are summarized in Table 3. The model achieves an  $R^2$  of 0.0823 (adjusted  $R^2 = 0.0817$ ), indicating that FII and DII flows jointly explain approximately 8.23% of daily return variation—low but expected in financial markets where returns are driven by numerous macroeconomic, behavioral, and global factors. The F-statistic is 122.19 ( $p = 0.000$ ), confirming overall model significance at the 1% level.

The FII coefficient ( $\beta_1 = 1.396 \times 10^{-6}$ ) is positive and highly significant ( $p = 2.20 \times 10^{-45}$ ), leading to rejection of  $H_{01}$ . This confirms that FII net inflows are a significant positive driver of Nifty returns, reflecting the Indian market's sensitivity to global capital flows. Every additional ₹1,000 crores of FII net buying is associated with an approximate 0.0014% increase in daily returns. The DII coefficient ( $\beta_2 = 3.12 \times 10^{-7}$ ) is also positive and significant ( $p = 0.0112$ ), leading to rejection of  $H_{02}$ . While smaller in magnitude than the FII effect, DII flows nonetheless contribute positively to returns—suggesting that during FII outflow phases, DII buying provides partial support to market levels.

**Table 3: OLS Regression Results**

Intercept ( $\beta_0$ ): 0.000245 ( $p = 0.0569$ , n.s.) | FII Flows ( $\beta_1$ ):  $1.396 \times 10^{-6}$  ( $p = 2.20 \times 10^{-45}$ , sig.) | DII Flows ( $\beta_2$ ):  $3.12 \times 10^{-7}$  ( $p = 0.0112$ , sig.) |  $R^2 = 0.0823$  | Adj.  $R^2 = 0.0817$  | F-stat = 122.19 ( $p = 0.000$ )

#### 4.4 Comparative Analysis: Pre-COVID (2015–2020) vs. Post-COVID (2020–2025)

A structural shift is visible across the two sub-periods. Mean Nifty returns increased from 0.00035 (2015–2020) to 0.00064 (2020–2025), reflecting post-pandemic recovery and policy stimulus. However, return volatility (standard deviation) rose from 0.00858 to 0.01204, indicating a more turbulent market environment post-2020. FII mean flows



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declined from +11.82 crores (net buyers) to -64.24 crores (net sellers), reflecting geopolitical uncertainty, rising global interest rates, and portfolio reallocation away from emerging markets. DII mean flows, by contrast, surged from +280.98 crores to +791.47 crores, underscoring the exponential growth of domestic SIP contributions, insurance investments, and mutual fund inflows. The FII–return correlation strengthened from 0.152 to 0.326 post-COVID, while the DII–return correlation became more negative (from -0.010 to -0.148), reinforcing the increasingly pronounced stabilizing role of domestic investors.

**Table 4: Comparative Analysis (Pre- vs. Post-COVID)**

Metric | 2015–2020 | 2020–2025 || Mean Nifty Return | 0.00035 | 0.00064 || Return SD (Volatility) | 0.00858 | 0.01204 || Mean FII Flows (₹Cr) | +11.82 | -64.24 || Mean DII Flows (₹Cr) | +280.98 | +791.47 || FII–Return Correlation | 0.152 | 0.326 || DII–Return Correlation | -0.010 | -0.148

### V. CONCLUSION

This study provides comprehensive empirical evidence on the relationship between institutional investment flows and stock market volatility at the NSE over 2015–2025. Three principal conclusions emerge. First, FII flows are a statistically dominant driver of Nifty returns ( $\beta_1 = 1.396 \times 10^{-6}$ ;  $p \approx 10^{-45}$ ), confirming that the Indian equity market is highly sensitive to foreign capital movements. This aligns with Behavioral Finance Theory (herd behavior, global risk-off episodes) and Market Microstructure Theory (large FII trades create demand-supply imbalances). Second, DII flows also significantly and positively influence returns ( $\beta_2 = 3.12 \times 10^{-7}$ ;  $p = 0.011$ ), albeit with smaller magnitude, consistent with their growing stabilization function. Third, the moderate negative correlation between FII and DII flows ( $r = -0.533$ ) and the post-COVID surge in DII participation signal a structural maturation of Indian capital markets: reduced dependence on foreign capital reduces systemic vulnerability.

The findings carry important implications. For regulators and policymakers (SEBI, RBI), the strong FII influence justifies monitoring foreign flow surges and maintaining circuit-breaker mechanisms. Policies that incentivize domestic retail and institutional participation—SIP tax benefits, enhanced pension fund equity limits—will further cushion the market from external shocks. For portfolio managers and investors, divergent FII-DII behavior offers tactical signals: DII accumulation during market declines may indicate entry points for long-term strategies. The study acknowledges limitations: the model's  $R^2$  of ~8% confirms that institutional flows are not the sole determinants of volatility; future research should incorporate GARCH modeling, macroeconomic variables (exchange rates, crude oil, US Fed rates), and sector-level analysis for deeper insights.

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