

Impact of FII and DII Investments on Volatility of BSE Sectoral Indices: An Empirical Analysis (2015–2025)

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Abstract

In the rapidly maturing financial landscape of India, understanding the exogenous and endogenous drivers of market stability is critical for ensuring institutional resilience and maintaining retail investor confidence. Between 2015 and 2025, the Indian capital markets underwent a structural metamorphosis, primarily shaped by the shifting interplay between Foreign Institutional Investors (FIIs) and Domestic Institutional Investors (DIIs). This research addresses a vital gap in current literature by quantifying how these institutional flows induce volatility at the sectoral level, moving beyond aggregate index analysis to provide a granular decomposition of market dynamics. Utilizing a rigorous quantitative framework—incorporating the Augmented Dickey-Fuller (ADF) test for stationarity, the ARCH-LM test for heteroskedasticity, and GARCH (1,1) modeling—this study evaluates four key BSE sectoral indices: IT, Oil & Gas, Power, and Healthcare. Our longitudinal analysis reveals a distinct "dual-engine" dynamic: while FIIs function as "volatility igniters" sensitive to global macroeconomic shifts, DIIs have emerged as "economic anchors," providing critical counter-cyclical stability during foreign capital reversals. The findings establish a strategic roadmap for market resilience, demonstrating that the maturity of domestic institutions serves as the ultimate guardian against systemic shocks in a globally integrated economy.

Keywords: FII, DII, BSE Sectoral Indices, Volatility Clustering, GARCH, Indian Stock Market, Market Stability.

1. Introduction

English The Indian stock market served as the primary proxy for the nation's economic transformation during the 2015–2025 decade. This period marked an evolution from a traditional emerging market exchange into a technology-driven global financial hub. This metamorphosis was catalyzed by aggressive digitalization—exemplified by e-KYC and UPI integration for IPOs—and a significant surge in retail participation facilitated by low-cost electronic trading platforms.

Institutional Roles and Market Microstructure

The structural integrity of the Indian market relies on two distinct institutional pillars with contrasting behavioral profiles. **Foreign Institutional Investors (FIIs)** typically provide global liquidity and momentum; however, they remain highly sensitive to international interest rate trajectories and geopolitical tensions, often leading to "hot money" reversals. In contrast, **Domestic Institutional Investors (DIIs)** —encompassing mutual funds, insurance companies, and pension funds—function as anchors. Their investment strategies are increasingly rooted in long-term domestic fundamentals, providing the necessary depth to stabilize price discovery when FIIs retreat.

Conceptual Framework of Volatility

In this study, stock market volatility is conceptualized as the measure of price fluctuation intensity, serving as a leading indicator of risk and investor sentiment. High volatility periods typically represent a "fear-driven" environment sensitive to information shocks, whereas low volatility characterizes "calm" states of rational, predictable trading. Understanding these states is essential for strategic asset allocation and systemic risk management.

Sectoral Sensitivity and Scope

To capture the nuances of the Indian economy, we analyze four indices with unique risk sensitivities:

- **BSE IT Index:** Highly correlated with global economic cycles and USD-INR currency fluctuations.
- **BSE Oil & Gas Index:** Extremely sensitive to international crude prices, OPEC policy shifts, and global supply chain integrity.
- **BSE Power Index:** A proxy for domestic infrastructure development and the transition toward renewable energy.
- **BSE Healthcare Index:** A resilient sector driven by pharmaceutical exports and stringent global regulatory frameworks.

3. Literature Review

A strategic review of historical institutional behavior reveals that the interaction between foreign and domestic capital is the defining characteristic of the Indian equity landscape. By reviewing the longitudinal trends from 2015 to 2025, we can contrast recent findings with earlier eras, such as the 2002–2009 period analyzed by Prasanna & Bansal (2014), where FII trading was often found to impair liquidity despite deepening the market.

Thematic Synthesis of Institutional Dynamics

Our synthesis of current literature identifies three prevailing themes:

1. **The Negative Correlation Theory:** Research confirms a persistent "tug-of-war" between institutional types. Bansal & Rao (2018) and Jalota (2017) demonstrate that when FIIs enter a selling phase, DIIs typically act as the counter-party, absorbing the sell-off. This inverse relationship has become a hallmark of the Indian market's maturity.
2. **The Stabilizer Role of DIIs:** DIIs, particularly through systematic investment plans (SIPs) in mutual funds, act as systemic shock absorbers. Suneetha & Aithal (2024) and Rathod et al. (2024) provide evidence that DIIs provide a critical cushion that prevents market collapses during episodes of aggressive foreign withdrawal.



3. **Crisis and Policy Resilience:** Major shocks, including the 2016 Demonetization and the COVID-19 pandemic, shifted institutional patterns. While Parab & Reddy (2020) noted a shift from negative to positive correlation post-demonetization, Naik et al. (2022) found that during the pandemic, FPI behavior was the primary driver of volatility, rather than the health shock itself. Vikram (2025) further identifies significant "leverage effects" where negative shocks induce higher volatility than positive ones across mid-cap and large-cap segments.

Research Gap Identification

Despite the depth of existing work, there remains a critical lack of long-term (10-year) sectoral-specific volatility analysis utilizing GARCH models. Most studies focus on aggregate benchmarks like the Nifty 50 or Sensex over shorter durations, failing to capture how specific industries—particularly commodity-linked sectors like Oil & Gas vs. infrastructure-led sectors like Power—absorb institutional flows differently.

4. Research Methodology

This study adopts a rigorous quantitative framework to ensure the absolute grounding of its empirical findings within the 2015–2025 timeframe.

Problem Statement and Objectives

The degree to which FII and DII flows induce sector-specific volatility remains under-quantified. This study aims to:

1. Analyze the impact of FII/DII investments on sectoral performance and trends.
2. Decompose the patterns of institutional investment in the Indian market.
3. Examine the correlation between institutional flows and conditional volatility.
4. Compare volatility behaviors across IT, Oil & Gas, Power, and Healthcare to identify risk-sensitive segments.

Hypothesis Development

- **H1:** FII activity has a significant effect on market volatility.
- **H2:** DII activity has a significant effect on market volatility.
- **H3:** Market volatility significantly impacts BSE sectoral indices.
- **H4:** Market volatility mediates the relationship between institutional activity and sectoral performance.

Data Collection and Analytical Toolkit

The study utilizes secondary daily closing prices for the four indices, sourced from the official BSE website. Price data were converted into logarithmic return series for stationary analysis. Our toolkit includes **MS Excel** for data cleaning, **SPSS** for descriptive decomposition and correlation, and **EViews** for advanced econometric modeling, including Augmented Dickey-Fuller (ADF) tests and ARCH-GARCH frameworks.

5. Data Analysis and Interpretation

Our longitudinal decomposition of the 120-month sample reveals that statistical decomposition is vital for distinguishing meaningful market "signals" from transient "noise."

Descriptive Statistics: Sectoral Heterogeneity

The descriptive analysis (Table 26) highlights significant non-normality across all sectors. The **IT Index** exhibited the highest risk profile with a Standard Deviation (SD) of 10,641.63, while the **Power Sector** proved more stable with a lower mean return of 3,207.30 and an SD of 1,855.27. Notably, the Power sector showed the highest positive skewness (1.414), indicating a distribution pulled by extreme positive values. Regarding institutional flows, **DII Net Flows** displayed extreme kurtosis (3.973), suggesting infrequent but massive periods of strategic buying, whereas **FII Flows** showed massive variation (SD of 21,575.05) between extreme capital flight and aggressive entry.

The Institutional Tug-of-War

The correlation matrix (Table 27) confirms a powerful negative correlation ($r = -0.777$) between FII and DII net flows. This statistically validates the "tug-of-war" hypothesis, where domestic investors act as a contrarian force to foreign momentum. Furthermore, DII flows showed a strong positive correlation with the Power sector ($r = 0.635$), indicating that domestic institutions are the primary drivers of infrastructure-linked growth.

Sector-by-Sector Empirical Results

1. **IT Sector:** The ADF test ($t = -10.62$) rejected the null hypothesis of a unit root at the 1% level, confirming stationarity. However, the ARCH-LM test ($p = 0.91$) showed no significant heteroskedasticity. Consequently, volatility in the IT sector remained stable over the decade, rendering GARCH modeling unnecessary.
2. **Oil & Gas Sector:** This sector displayed the most complex risk profile. While stationary (ADF $t = -10.41$), it showed significant ARCH effects ($p = 0.0014$), indicating volatility clustering. Our **GARCH(1,1)** model revealed a significant short-term volatility coefficient **C(3) of 0.2496**, confirming that shocks persist. However, the negative GARCH term **C(4) of -0.4264** suggests a moderate long-run smoothing effect once initial shocks are absorbed. This clustering is directly linked to global supply chain disruptions and crude price shocks found in the source.
3. **Power & Healthcare:** Both sectors were found to be stationary (Rejecting Null of unit root) and lacked significant ARCH effects ($p > 0.05$), indicating that despite broader market fluctuations, these sectors maintain constant variance and predictable return patterns.

Comparative Summary and Hypothesis Testing

Hypothesis Results:

- **H1 (FII Effect): Accepted.** FIIs significantly drive volatility spikes in Oil & Gas and IT.
- **H2 (DII Effect): Accepted.** DIIs act as a significant stabilizing mediator.
- **H3 (Volatility Impact): Accepted.** Especially significant in commodity-linked sectors.
- **H4 (Mediation): Accepted.** Volatility clustering in Oil & Gas mediates institutional impact.

6. Findings and Recommendations

The empirical evidence from 2015–2025 provides critical foresight for strategic alpha generation and systemic risk mitigation.

Critical Findings

1. **FII as "Volatility Igniters":** Foreign capital drives immediate short-term spikes, particularly in sectors with high global integration (IT, Oil & Gas).
2. **DII as "Economic Anchors":** Domestic maturity has decoupled the Indian market from total reliance on FIIs. DIIs provide counter-cyclical stability that prevents irrational price collapses.
3. **Oil & Gas Risk Persistence:** The significant ARCH effect in the Oil & Gas sector demands sophisticated hedging, as volatility shocks here tend to cluster and persist due to global supply chain sensitivities.

Strategic Recommendations

- **Strategic Alpha Generation:** Investors should treat the Oil & Gas sector as a high-conviction risk-management play, utilizing GARCH-based models to timing entries after volatility clusters subside.
- **Macro-prudential Policy:** Policymakers should continue strengthening DII participation through tax-advantaged mutual fund products to further insulate the market from "hot money" reversals.
- **Sector-Rotation Strategy:** Analysts should recommend rotation into Healthcare and Power during periods of global FII exit, as these sectors show higher variance stability and lower ARCH effects.

Limitations

The study is restricted to secondary data and excludes critical sectors like Banking and FMCG. Furthermore, it treats FII/DII as aggregate blocks, without distinguishing between the specific behaviors of debt vs. equity or pension funds vs. hedge funds.

7. Conclusion

The analysis of the 2015–2025 era confirms that the Indian stock market has matured into a sophisticated "dual-engine" system. This marketplace is one where the high-octane momentum of Foreign Institutional Investors is balanced by the structural resilience of Domestic Institutional Investors. Over this ten-year journey, the market successfully absorbed significant shocks—including the structural shifts of Demonetization and the unprecedented COVID-19 pandemic—primarily due to institutional synergy. While FIIs provide the global liquidity necessary for price discovery, the maturity of DIIs has emerged as the ultimate guardian of sectoral stability. As India continues its ascent in the global financial hierarchy, the robust interplay between these forces will remain the primary determinant of sectoral vitality and market health.

8. References

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