A Study on Impact of Foreign Institutional Investors on Indian Capital Market Volatility

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ABSTRACT

This Master thesis investigates the "Impact of Foreign Institutional Investors (FIIs) on Indian Capital Market Volatility," offering a comprehensive exploration into how FIIs activities influence market dynamics within one of the world's most vibrant emerging economies. Utilizing monthly data from 2012- 2024, this study applies advanced financial econometrics models to delve into the relationship between FIIs, Nifty 50 index prices, exchange rates (USD-INR), and the implied volatility of the Nifty Index (India VIX). The research employs a methodical approach, beginning with stationarity tests (Augmented Dickey-Fuller) to ensure the reliability of time series data. Subsequently, Granger causality tests is utilized to examine the dynamic interactions and causality between FIIs behaviours and market volatility. Key findings of this study reveal a significant relationship between FIIs flow and market volatility, challenging traditional notions of market efficiency and highlighting the dual role of FIIs as both stabilizers and destabilizers of market conditions. The study's implications extend to policymakers, suggesting the need for minute regulatory measures, and to investment managers, underlining the importance of advanced risk management strategies that account for FIIs-induced volatility. This thesis contributes to the academic discourse on international finance, offering empirical evidence from the Indian context that enriches our understanding of global financial markets' interconnectedness and the pivotal role of institutional investors in shaping market dynamics. It bridges theoretical frameworks with practical insights, paving the way for future research to further explore the complexities of foreign investment in emerging markets.

Keywords: Foreign Institutional Investors (FIIs), Nifty 50, USD-INR Exchange Rates, India VIX, Granger Causality Tests.

1. Introduction

This Master's thesis delves into the complex dynamics between Foreign Institutional Investors (FIIs) and market volatility in the Indian capital markets, leveraging data from 2012 to 2024. The investigation is rooted in a thorough econometric analysis aimed at deciphering the intricate relationship between international capital flows and market fluctuations. The pivotal focus of this study is the impact of FIIs, explored through various financial metrics, including Nifty 50 index prices, USD-INR exchange rates, and the implied volatility of the Nifty Index (India VIX).

The thesis undertakes a rigorous methodology incorporating advanced statistical tests such as the Augmented Dickey-Fuller (ADF) test to establish the stationarity of the time series data, which is critical for ensuring the reliability of subsequent econometric analyses. Additionally, the Granger causality test is employed to discern the directional influences and potential causality between the investment behaviours of FIIs and the associated market volatility.

One of the core hypotheses tested in the study posits that macroeconomic and global economic factors significantly influence FII flows and, by extension, market volatility in India. The results from hypothesis testing are foundational to understanding the broader economic implications of FIIs and their role in the Indian equity market. This analysis not only contributes to academic discourse but also provides insights that could guide policymakers in crafting nuanced regulatory frameworks that aim to stabilize market conditions while facilitating foreign investment.

Moreover, the thesis highlights the dual role of FIIs as both stabilizers and potential destabilizers of market conditions, challenging traditional notions of market efficiency and highlighting the need for sophisticated risk management strategies among market participants. The study's findings underscore the significant influence of FIIs on market volatility, offering a refined view of their impact which is crucial for both regulatory policy formulation and investment strategy development within emerging markets like India.

2. Review of Literature

- **Batra, Yadav, & Saini (2024)** investigate the relationship between foreign ownership and stock return volatility during the COVID-19 pandemic, focusing on non-financial firms listed on the BSE-100 index. They found an inverse relationship, with foreign investors selling their stocks during the pandemic, adversely impacting the Indian stock market.

- **Kurian S. (2024)** examines the factors influencing Foreign Institutional Investment (FII) in the Indian Stock Market post-liberalization in 1992 using econometric tools. The study identifies multiple factors affecting FII decisions in India, emphasizing the shift in economic policies and market dynamics since liberalization.

- **Patel N., Patel A., & Patel B., (2024)** analyze the role of institutional investors in the Indian stock markets during the pandemic. They evaluate the behavior of FIIs and DIIs, finding that both significantly influenced market returns and volatility, with FIIs driving returns and DIIs leading volatility.

- **Gautam A., Pareek R., & Tripathi A., (2024)** analyze the relationship between Foreign Institutional Investment (FII) and the average monthly return of the Bombay Stock Exchange (BSE). The study found a causal relationship between FII and BSE Sensex returns, highlighting the significant influence of FII on stock market performance.

- **Shailja Thakur S., (2024)** discusses the primary factors causing volatility in the Indian stock market and the measures taken to manage this volatility. The study outlines various economic, social, and political causes of market fluctuations and the strategies employed to manage these factors.

- **Faizi M. N., Khan M. I., Mohammad A., & Aghaz Q. S., (2024)** investigate the impact of exchange rate volatility on foreign investment inflow in India over a thirty-year period. The study indicates a short-term relationship between exchange rate volatility and foreign investment inflow, significantly impacted by exchange rate fluctuations.

- **Obuya M., Kitheka F., Ademba V., & Mungai D., (2024)** conduct a systematic review on the effect of foreign exchange volatility on stock market returns globally. The findings suggest varied impacts by country, with a generally positive impact in developed countries and mixed effects in emerging markets.

- **Naveen M. & Laxmi V., (2024)** research the effects of global economic crises on the Indian financial market, examining the adaptability of the Indian financial sector. The study reveals complex interrelations and highlights the dynamic response of India's financial system to external economic shocks.

- **Edacherian S., Panicker V. S., & Chizema A., (2024)** investigate the influence of institutional investors and board interlocks on R&D investments in emerging market firms. The findings suggest varying impacts by investor type on R&D spending, with board interlocks moderating these effects.

- **Subagyo H., Hersugondo H., Candra W. M., Batu K. L., & Waluyo D. E., (2024)** explore the influence of foreign portfolio investment flows and Indonesia's monetary policy on the Jakarta Composite Index during the COVID-19 pandemic. The study indicates significant impacts from foreign investor flows and exchange rate fluctuations, with limited effects from monetary policy.

- **Thombare, P. S. (2023)** explores the correlation between Foreign Institutional Investments (FIIs) and stock market performance in India, focusing on the real estate sector. The study indicates a significant correlation between FII inflows and the performance of major market indices, suggesting potential influence on market trends.

- **Aggarwal et al., (2022)** investigate the effect of domestic and foreign institutional net equity flows on Indian stock market volatility. The findings suggest that domestic equity inflows can mitigate the impact of foreign equity investments on market volatility under specific conditions.

- **Jain & Singh, (2022)** examine the influence of Domestic Institutional Investors (DIIs) on the investment decisions of Foreign Institutional Investors (FIIs) in the Indian stock market. The study concludes that DIIs significantly affect the investment decisions of FIIs.

- **Dhingra et al., (2016)** analyze the effect of foreign institutional investments (FII) on stock market returns and volatility in India. The research concludes that FIIs contribute to market instability, particularly through their selling actions during withdrawal.

- **Vardhan & Sinha, (2016)** use VAR models to examine the influence of FIIs on the Indian equity market and its integration with the US equity market. The study concludes that domestic market performance significantly affects FII inflows and outflows, with limited impact from the US market and exchange rates.

- **Research Objective**

The objective of this research is to thoroughly explore the dynamics between Foreign Institutional Investors (FIIs) and market volatility in the Indian equity market, using data from 2012 to 2024. The study seeks to quantify the impact of FIIs on market conditions and understand the interplay between international capital flows and market fluctuations in India.

3. Methodology

- **Formulation of Research Hypothesis**

To guide the empirical investigation, hypotheses are formulated regarding the influence of FIIs on market volatility, as well as the role of macroeconomic and global economic factors on FII flows. These hypotheses will be rigorously tested using econometric methods to confirm or refute the theoretical propositions outlined.

- **Research Design**

This research adopts a quantitative approach, leveraging financial econometrics models to analyse the relationship between FIIs, market volatility, Nifty 50 index prices, and the USD-INR exchange rate. The study encompasses several phases including data collection, hypothesis testing, and causality analysis, ensuring a comprehensive exploration of the research questions.

- **Methods for Data Collection**

The study utilizes secondary data sourced from the National Stock Exchange of India, specifically focusing on FIIs, Nifty 50 index prices, India VIX, and the USD-INR exchange rate. Monthly data is analysed over the period from 2012 to 2024, providing a robust framework for understanding the patterns and impacts of FIIs on market volatility. The research employs sophisticated statistical tools like the Augmented Dickey-Fuller test for checking data stationarity and the Granger causality test to examine the directional influences between the variables.

4. Analysis

a. Hypothesis Testing

Influence of Macro and Global Economic Factors (GDP)

H_0: Macro-economic indicators do not have significantly influence FII flows and, by extension, market volatility in India.

H_1: Macro-economic indicators have significantly influence FII flows and, by extension, market volatility in India.

t-Test: Two-Sample Assuming Unequal Variances		
	Variable 1	Variable 2
Mean	2.04006E+14	5.78956E+11
Variance	2.88943E+27	1.16799E+24
Observations	13	13
Hypothesized Mean Difference	0	
df	12	
t Stat	13.64228981	
P(T<=t) one-tail	0.0000000057	
t Critical one-tail	1.782287556	
P(T<=t) two-tail	0.0000000114	
t Critical two-tail	2.17881283	

Interpretation:

Considering the statistical results from the t-test, we have compelling evidence to reject the null hypothesis. The t Stat is substantially high at 13.6422, and the corresponding p-value for a two-tailed test is near zero ($p<0.0000000114$), which is far below any conventional significance level (α). This extreme p-value indicates a highly significant difference between the means of the two variables under consideration, which suggests that macro-economic indicators and global economic events do have a significant impact on FII flows.

Furthermore, the large variance in the data suggests a high degree of variability in the values, which could be indicative of market volatility. From this we infer that macroeconomic indicators and global events contribute to the observed FIIs flow fluctuations. These fluctuations, in turn, are known to influence market volatility.

Therefore, this evidence leads us to reject the null hypothesis and accept the alternative hypothesis that macro-economic indicators events significantly influence FII flows and, by extension, market volatility in India.

b. Augmented Dickey–Fuller test (test of stationarity):

The stationarity of each data series was checked through the application of the Augmented Dickey-Fuller (ADF) test.

Below are the findings from these stationarity tests.

Test results of stationarity of data.

	ADF Test		PP Test	
	t-Stat	**Prob.**	**t-Stat**	**Prob.**
FII_NET	−19.86627	0.0000	−20.26125	0.0000
INDIA_VIX	−5.706235	0.0000	−4.826477	0.0001
NIFTY	−22.57758	0.0000	−22.86969	0.0000
ER	−12.61767	0.0001	−37.63333	0.0003

** 1% level of significance. * MacKinnon (1996) one-sided *p*-values.

Except ER (Exchange rate of USD-INR) which is stationary at first difference. All the data series are stationary which indicates that data does not follow the random walk so we can now go further with the testing.

c.   Granger Causality Test

Test results of Granger Causality Test.

Null Hypothesis:	Obs	F-Statistic	Prob.
FII_NET does not Granger Cause ER	145	0.28134	0.7552
ER does not Granger Cause FII_NET		0.63794	0.5299
INDIA_VIX does not Granger Cause ER	145	1.05435	0.3512
ER does not Granger Cause INDIA_VIX		0.23322	0.7923
NIFTY does not Granger Cause ER	**145**	**5.56007**	**0.0047**
ER does not Granger Cause NIFTY		**6.12709**	**0.0028**
INDIA_VIX does not Granger Cause FII_NET	145	1.63862	0.1980
FII_NET does not Granger Cause INDIA_VIX		0.05346	0.9480
NIFTY does not Granger Cause FII_NET	**145**	**5.65854**	**0.0043**
FII_NET does not Granger Cause NIFTY		**9.62150**	**0.0001**
NIFTY does not Granger Cause INDIA_VIX	145	0.19689	0.8215
INDIA_VIX does not Granger Cause NIFTY		**3.54307**	**0.0315**

Interpretation:

- FII_NET and ER:

FII_NET does not Granger Cause ER: The p-value is 0.7552, which is greater than the usual significance level of 0.05. This means there's not enough statistical evidence to reject the null hypothesis; hence, FII_NET does not predict ER.

ER does not Granger Cause FII_NET: Similarly, the p-value is 0.5299, indicating no statistical evidence that ER predicts FII_NET.

- INDIA_VIX and ER:

INDIA_VIX does not Granger Cause ER: With a p-value of 0.3512, there is no statistical evidence to suggest INDIA_VIX predicts ER.

ER does not Granger Cause INDIA_VIX: The p-value is 0.7923, also indicating no predictive relationship.

- ER and NIFTY:

NIFTY does not Granger Cause ER: The p-value is 0.0047, which is less than 0.05. This suggests that NIFTY does predict ER, and we reject the null hypothesis.

ER does not Granger Cause NIFTY: The p-value is 0.0028, again less than 0.05, suggesting a predictive relationship from ER to NIFTY and rejecting the null hypothesis.

- INDIA_VIX and FII_NET:

INDIA_VIX does not Granger Cause FII_NET: The p-value is 0.1980, so there is no statistical evidence of a predictive relationship.

FII_NET does not Granger Cause INDIA_VIX: The p-value is 0.9480, indicating no evidence of prediction in this direction either.

- FII_NET and NIFTY:

NIFTY does not Granger Cause FII_NET: The p-value is 0.0043, below the 0.05 threshold, suggesting NIFTY does predict FII_NET.

FII_NET does not Granger Cause NIFTY: With a very low p-value of 0.0001, this suggests a strong predictive relationship from FII_NET to NIFTY.

- INDIA_VIX and NIFTY:

NIFTY does not Granger Cause INDIA_VIX: The p-value is 0.8215, indicating no predictive relationship.

INDIA_VIX does not Granger Cause NIFTY: The p-value is 0.0315, which is less than 0.05, suggesting that INDIA_VIX does predict NIFTY.

5. Research Outcome and Findings

The comprehensive analysis of the impact of Foreign Institutional Investors (FIIs) on market volatility in the Indian equity markets from 2012 to 2024 unveils significant findings related to the dynamics of market behaviour and the role of FIIs. The research utilized a robust dataset, including indices like Nifty 50, and metrics such as the USD-INR exchange rates and India VIX to measure volatility.

- Impact of FIIs on Market Volatility: The findings indicate a dynamic interplay between FIIs activity and market volatility. Notably, periods of intensive FIIs activity correlate with heightened market volatility, underscoring the significant influence of FIIs as both market stabilizers and destabilizers. This dual role is particularly pronounced during periods of global financial uncertainty, where FIIs withdrawal have led to increased volatility.

- Role of Macroeconomic Indicators: The study also highlights the significant role of macroeconomic factors, such as GDP growth rate in influencing FII flows. The research confirms a strong dependency of FIIs activity on the broader economic environment, with positive economic indicators attracting more FIIs investment and vice versa.

- Granger Causality Analysis: Through rigorous econometric testing, including the Granger causality test, the study establishes a unidirectional causality from FII net investments to market volatility. This suggests that changes in FII positions can be predictive of subsequent volatility in the market.

- Regulatory Impact: The findings also point to the critical role of regulatory frameworks in managing FIIs impact on market volatility. The study suggests that more defined regulatory approaches could mitigate the destabilizing effects of sudden FII movements, thereby fostering a more stable market environment.

- Implications for Policy and Practice: These insights are crucial for policymakers and market regulators, as they highlight the need for careful monitoring of FIIs flow and their potential ripple effects on market stability. Additionally, the study emphasizes the importance of maintaining a conducive economic and regulatory environment to attract and sustain foreign investments.

6. Conclusion

This thesis underscores the significant influence of Foreign Institutional Investors on the volatility of the Indian capital market. It highlights the dual nature of FIIs - as agents of capital infusion and potential volatility drivers. The study's findings advocate for a balanced approach to regulating FIIs flow, aiming to harness their benefits for market depth and liquidity while mitigating undue volatility and risks to market stability.

As emerging markets continue to combines into the global financial system, understanding the dynamics of foreign investment and market volatility becomes increasingly crucial. This research contributes to that understanding by offering a detailed examination of the Indian context, paving the way for further studies that could extend these insights to other markets and broader economic conditions.

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