# **A STUDY ON IMPACT OF FOREIGN INSTITUTIONAL INVESTORS ON INDIAN CAPITAL MARKET VOLATILITY**

Master Thesis Report submitted in partial fulfilment of the requirement for the award of the degree of

Master of Business Administration (MBA)

Submitted By

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2024

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Total Pages : **52**

Name of the Researcher : **Kalathiya Zeel Mukesh**

Department : **Finance**

Institution : **Faculty of Management Studies, CMS Business School**

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# **Acknowledgement**

I extend my heartfelt gratitude to a host of individuals whose unwavering support, insightful guidance, and encouragement have been instrumental in the completion of my master thesis on "Impact of Foreign Institutional Investors (FIIs) on Indian Capital Market Volatility,"

Foremost, I express my profound appreciation to my mentor, Dr. Shalini from the Finance Department, whose expertise, and mentorship have been the cornerstone of my research journey. Dr. Shalini relentless dedication, invaluable feedback, and inspiring guidance have not only shaped this thesis but also my academic and professional outlook. Her ability to challenge and push boundaries has encouraged me to explore the depths of this subject with rigor and enthusiasm.

I am immensely grateful to the faculty and staff of the Finance Department for their constructive criticism and invaluable insights throughout this process. Their commitment to academic excellence and their supportive environment has significantly contributed to my growth and learning.

Lastly, I acknowledge the scholarly contributions of various authors, researchers, and institutions whose work provided the academic foundation for my study. The literature and data they have published have been pivotal in framing the context and substance of my research.

This thesis is not only a reflection of my academic journey but also a testament to the collective support and inspiration I received from everyone mentioned and many others who have contributed in various ways. My deepest gratitude to you all.

Kalathiya Zeel Mukesh,

10/12/2024

# **Abstract**

This Master thesis investigates the "Impact of Foreign Institutional Investors (FIIs) on Indian Capital Market Volatility," offering a comprehensive exploration into how FII activities influence market dynamics within one of the world's most vibrant emerging economies. Utilizing a decade of weekly data from 2012 to 2021, this study applies advanced financial econometrics models to delve into the relationship between FII open interest, Nifty 50 index spot 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, Vector Autoregression (VAR) models and Granger causality tests are utilized to examine the dynamic interactions and causality between FII behaviours and market volatility. Cointegration tests further assess the long-term equilibrium relationships among the variables, providing insights into the enduring impacts of FIIs on market stability.

Key findings reveal a significant relationship between FII flows 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 FII-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 explore the complexities of foreign investment in emerging markets further

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# **Chapter 1: Introduction and Review of Literature**

## **1.1. Rationale for the Study and Motivation**

The liberalization of financial markets across the globe has led to an unprecedented increase in cross-border capital flows, particularly into emerging economies. Among these flows, investments by Foreign Institutional Investors (FIIs) have gathered significant attention due to their potential impact on market dynamics. India, with its growing economy and liberalized financial sector, has become a profitable destination for such investments. This surge in FII activity raises questions about its implications for the volatility of the Indian capital market.

The existing body of literature provides mixed evidence on the role of FIIs in market volatility. Some studies suggest that FII flows contribute to market stability by providing liquidity and enhancing the efficiency of price discovery processes. In contrast, others argue that FIIs may increase market volatility, particularly during periods of financial distress, by engaging in herding behaviour or rapid, large-scale reversals of capital flows. This separation in views underscores a significant gap in our understanding of FIIs' impact on market volatility in the Indian context, necessitating a comprehensive investigation.

Furthermore, the Indian capital market has undergone numerous regulatory and structural changes in recent decades, aimed at attracting foreign investment while ensuring market stability. These changes have likely altered the landscape in which FIIs operate, making previous findings on their impact potentially obsolete. Hence, there is a compelling need for updated empirical analysis that considers the current regulatory and market environment.

My interest in the impact of Foreign Institutional Investors on market dynamics arise from a broader interest with financial markets and their critical role in economic development. The minute interplay between regulatory policies, investor behaviour, and market outcomes offers a rich field for academic inquiry. Specifically, the Indian capital market, with its unique characteristics and significant growth over the years, presents an attract case for studying the effects of foreign investment on market volatility.

Through this thesis, I aim to bridge the gap in the literature, providing insights that could guide policymakers in designing frameworks that encourages market stability while encouraging foreign investment. Moreover, this study offers a valuable opportunity to apply and enhance my analytical skills, leveraging quantitative methods to separate out complex relationships within financial data.

## **1.2. Statement of the Research Problem**

The integration of global financial markets has deeply affected capital flows, especially in emerging economies like India, which has become a focal point for Foreign Institutional Investors (FIIs). These investors play a pivotal role in shaping the financial landscape, bringing capital, technology, and expertise that can lead to enhanced market efficiency and growth. However, their impact on market volatility—a critical aspect of financial stability and investor confidence—presents a complex puzzle. Despite the potential benefits of FII involvement, there is an ongoing debate about whether their activities contribute to or mitigate market volatility. This thesis seeks to explore this relationship within the Indian context, a market characterized by significant FII participation and dynamic regulatory changes.

Recent data illustrate the magnitude of FII engagement in India, with net FII investments reaching approximately $8 billion. Despite such substantial capital inflows, the Indian capital market has experienced periods of heightened volatility, with the benchmark Sensex index witnessing swings of over 10% within single trading months. These figures underscore the critical need to examine the correlation between FII flows and market volatility, particularly in an economy trying for stability amongst the global financial turbulence.

Furthermore, the Indian capital market has been subject to extensive regulatory reforms aimed at attracting foreign investment and safeguarding markets. Such reforms include the relaxation of investment caps for FIIs and the introduction of stricter reporting requirements, which have significantly altered the investment landscape.

The research problem had twofold: Firstly, there is a lack of updated empirical analysis that reflects the current magnitude and patterns of FII investments in India and their relationship with market volatility. Secondly, the effect of recent regulatory changes on this dynamic remains unclear. By employing a comprehensive dataset that includes FII investment flows, market volatility indices, and regulatory milestones from the past decade, this study aims to fill these gaps. It seeks to provide a clear understanding of how FII activities influence market volatility in the contemporary Indian financial landscape.

## **1.3. Review of Literature**

The connection between Foreign Institutional Investors (FIIs) and market volatility in emerging economies, particularly India, has gathered extensive scholarly attention due to the substantial role FIIs play in shaping market dynamics. This literature review critically examines twenty recent studies that shed light on various sides of this complex relationship. Each study is selected for its relevance, methodological accuracy, and contribution to the discourse on FIIs and market volatility.

1. Batra, Yadav, & Saini (2024) investigates the relationship between foreign ownership and stock return volatility, particularly during the COVID-19 pandemic, using data from non-financial firms listed on the BSE-100 index. To examine how foreign ownership affects stock return volatility and how this relationship was influenced by the COVID-19 pandemic. The findings of the study show that there is an inverse relationship between foreign ownership and stock return volatility, with foreign investors selling their stocks during the pandemic, negatively affecting the Indian stock market.

2. Kurian S. (2024) identifies the factors influencing Foreign Institutional Investment (FII) in the Indian Stock Market, particularly post-liberalization in 1992, and uses econometric tools for the analysis. The objectives include to identify and analyse the determinants of FII in the Indian Stock Market post-liberalization. The study concludes that several factors affect FII decisions in India, highlighting the shift in economic policies and market dynamics since liberalization.

3. Patel N., Patel A., & Patel B., (2024) studies the Role of Institutional Investors in The Indian Stock Markets During the Pandemic. This study evaluates the behaviour of FIIs and DIIs in the Indian stock market during the COVID-19 pandemic, analysing their impact on market returns and volatility through various econometric methods. The Objectives of study where to assess the influence of FIIs and DIIs on the returns and volatility of major Indian stock indices during the COVID-19 pandemic. And the findings show that both FIIs and DIIs significantly influenced market returns and volatility, with FIIs driving returns and DIIs leading volatility during the pandemic.

4. Gautam A., Pareek R., & Tripathi A., (2024) analyses the relationship between Foreign Institutional Investment (FII) and the average monthly return of the Indian stock market, particularly focusing on the Bombay Stock Exchange (BSE). Objectives of the study was to examine the factors driving FII in the Indian stock market and their impact on market returns. This research found a causal relationship between FII and BSE Sensex returns, highlighting the significant influence of FII on stock market performance.

5. Shailja Thakur S., (2024) discusses the primary factors causing volatility in the Indian stock market and the measures taken by government and regulatory bodies to manage this volatility. The objectives of study are to identify and evaluate the main factors contributing to stock market volatility in India and the efforts to mitigate these factors. This study outlines various causes of market volatility, including economic, social, and political factors, and details the strategies employed to manage market fluctuations.

6. Faizi M. N., Khan M. I., Mohammad A., & Aghaz Q. S., (2024) investigates the relationship and impact between exchange rate volatility and foreign investment inflow in India over a thirty-year period, using various statistical tests and models. The objective of this study is to assess the impact of exchange rate volatility on foreign investment inflow in India post-economic reforms. This analysis indicates a short-term relationship between exchange rate volatility and foreign investment inflow, with a significant impact of exchange rate on capital inflow.

7. Obuya M., Kitheka F., Ademba V., & Mungai D., (2024) conducts a systematic review to understand the effect of foreign exchange volatility on stock market returns, analysing many journal articles and studies. The objective was to explore the relationship between foreign exchange volatility and stock market returns globally. The findings of the study were that relationship between foreign exchange volatility and stock market returns varies by country, generally showing a positive impact in developed countries, while developing and emerging markets exhibit mixed effects.

8. Naveen M. & Laxmi V., (2024) researches on effects of global economic crises on the Indian financial market, examining changes in various economic indicators and the adaptability of the Indian financial sector. The objective of the study was to analyse how global financial crises influence India's financial market and its overall economic resilience. This study reveals complex interrelations between global economic crises and the Indian financial system, highlighting its dynamic response and adaptability to external economic shocks.

9. Edacherian S., Panicker V. S., & Chizema A., (2024) Investigates the influence of institutional investors and board interlocks on R&D investments in emerging market firms, this study applies various analytical techniques to a large sample of Indian firm-year observations. The objective of the study is to assess the impact of institutional investors and board interlocks on R&D investment decisions in emerging market firms. The finding suggest that different types of institutional investors have varying impacts on R&D investments, with foreign institutional investors and mutual funds negatively affecting R&D spending. Board interlocks can both positively and negatively moderate this impact.

10.Subagyo H., Hersugondo H., Candra W. M., Batu K. L., & Waluyo D. E., (2024) explores the influence of foreign portfolio investment flows and Indonesia's monetary policy on the Jakarta Composite Index during the COVID-19 pandemic, using advanced econometric models. The objective of the study was to examine the effects of foreign investor portfolio flows and monetary policy changes on the Indonesian stock market during the COVID-19 pandemic. The findings suggest that foreign investor flows significantly impacted the Jakarta Composite Index, with domestic investors influenced by foreign investment patterns. Monetary policy had limited effect on the index, but USD/IDR exchange rate fluctuations significantly affected the market.

11. Thombare, P. S. (2023 explores the correlation between Foreign Institutional Investments (FIIs) and stock market performance in India, focusing on the real estate sector. Utilizing data from 2002 to 2020, the research examines whether FIIs drive stock market indices like SENSEX and NIFTY or vice versa. The main objective was to analyse the impact of FIIs on the performance of the Indian stock market, particularly assessing the causality in the relationship between FII investments and market indices. The findings indicate a significant correlation between FII inflows and the performance of major market indices, suggesting that FIIs may influence market trends, though further investigation is needed to confirm causality.

12. Aggarwal et al., (2022) Investigates the effect of domestic and foreign institutional net equity flows on Indian stock market volatility, finding that domestic equity inflows can mitigate the impact of foreign equity investments on market volatility under certain conditions. The objectives were to determine the relationship between domestic and foreign net equity flows and Indian stock market volatility. The findings suggest that domestic equity inflows reduce the influence of foreign equity flows on market volatility only when they significantly exceed foreign inflows; otherwise, foreign inflows still impact market volatility.

13.Jain & Singh, (2022) examines the influence of Domestic Institutional Investors (DIIs) on the investment decisions of Foreign Institutional Investors (FIIs) in the Indian stock market, using regression analysis to explore the relationship between the investment patterns of DIIs and FIIs.The objective was to analyse the impact of DIIs on the investment behaviour of FIIs in India. This study concludes that DIIs significantly affect the investment decisions of FIIs, with mutual fund investments acting as a proxy for DII activity.

14. Dhingra et al., (2016) analyses the effect of foreign institutional investments (FII) on stock market returns and volatility in India using static and dynamic models. The research finds that FIIs act as positive feedback traders when investing and as negative feedback traders during withdrawal, significantly impacting market volatility, especially through selling activities. The objective was to investigate the dynamic interactions between foreign institutional investments and stock market return and volatility in India. Finding concludes that FIIs contribute to market instability, particularly through their selling actions, which markedly increase market volatility.

15. Vardhan & Sinha, (2016) study uses VAR models to examine the influence of FIIs on the Indian equity market and its integration with the US equity market, finding that domestic equity market significantly influences FII inflows and outflows. The objective was to analyse the impact of FIIs on the Indian stock market and its correlation with the US stock market. And the findings conclude that domestic market performance significantly affects FII inflows and outflows, while the exchange rate and the US market have limited impact.

16. Bhargava & Malhotra, (2015) explores the impact of FII on the Indian stock market, noting positive effects on market returns and Bombay stock exchange turnover, with FIIs causing an increase in both. However, there is no evidence of volatility spillover from FII to the Indian stock markets. The objective was to analyse the effect of FII on Indian stock market performance. And findings conclude that FII has a positive impact on market returns and turnover but does not contribute to market volatility.

17. Prasanna & Bansal, (2014) assesses the impact of FII on the liquidity of the Indian stock market between 2001 and 2010, finding that FII flows positively affect market capitalization and trading volume, yet negatively influence market liquidity. The main Objective was to evaluate the influence of FII on stock market liquidity in India. This research concludes that FII flows increase market activity but reduce liquidity, leading to excess market volatility and decreased liquidity.

18. Goudarzi & Ramanarayanan, (2011) investigates the cointegration and causality between the Indian stock market and FII during the 2008 world financial crisis, using methodologies like Engle-Granger and Johansen to explore the relationship. The main objective was to assess the impact of FII on Indian stock market volatility during the global financial crisis of 2008. The finding concludes that there is a cointegrated and bilateral causal relationship between the BSE500 stock index and FII series during the crisis.

19.Dhamija, (2008) explores the determinants and effects of FII flows on the Indian economy, focusing on firm-level characteristics and macroeconomic conditions, and discusses changes in regulatory policies affecting these investments. The main objective was to explore the factors influencing FII flows in India and their impact on economic development. The findings of this study concludes that FII flows are influenced by individual firm characteristics and macroeconomic conditions, with regulatory policies playing a significant role.

20.Dhillon & Kaur, (1970) investigates the impact of FIIs on stock market volatility in India, highlighting how capital market reforms have increased market sensitivity to both national and international events, and discusses the resultant volatility due to speculative FIIs investment. The main objectives were to examine the influence of FIIs on stock market volatility and how capital market reforms have affected this relationship. The findings suggest that FIIs investment contributes to increased market volatility, and the Indian stock market is affected by both domestic and international events.

## **1.4. Identification of Research Gaps**

Temporal Dynamics and Long-Term Effects:

Despite the comprehensive analysis this study leaves unanswered questions about the sustainability of FIIs' influence on market stability. For instance, data from the Securities and Exchange Board of India (SEBI) indicate that FII flows have shown increasing trends over the past decade, with net investments growing significantly. This rise underscores the need for research focusing on how these investments have correlated with long-term market volatility trends, beyond immediate market reactions, to recognize patterns and potential stabilization mechanisms over time.

Macroeconomic Factors and Global Shocks:

The global financial ecosystem is increasingly interconnected, making emerging markets like India vulnerable to international economic shocks. For instance, the recent COVID-19 pandemic has had profound impacts on FII flows and market volatility. A refined analysis that models the interaction between such global shocks, macroeconomic indicators (e.g., GDP growth rates), and FII activity could offer a comprehensive understanding of how externalities influence Indian market volatility.

## **1.5 Theoretical framework**

The exploration of the impact of Foreign Institutional Investors (FIIs) on the volatility of Indian capital markets is sustain by several key theoretical frameworks that elucidate the mechanisms through which international capital flows influence market dynamics. This section describes the foundational theories that inform the study, offering a conceptual basis for understanding the multifaceted relationship between FIIs and market volatility.

Efficient Market Hypothesis (EMH)

The Efficient Market Hypothesis, particularly its semi-strong form, which posits that asset prices reflect all publicly available information, provides a lens through which to assess the market impact of FIIs. Data from SEBI indicate that FII flows into India have occasionally preceded significant market movements, challenged the idea of perfect market efficiency, and highlighted the need to examine the variation of information distribution and market response within the Indian context.

Granger Causality Test

The Granger Causality Test was first introduced by Sir Clive Granger in 1969, in his seminal paper "Investigating Causal Relations by Econometric Models and Cross-spectral Methods." Granger's motivation was to develop a statistical framework that could test for causality between time series data in a non-experimental setting, where traditional experimental approaches to establishing causality were not feasible. His work fundamentally changed how economists and statisticians infer causal relationships in time series analysis, earning him the Nobel Prize in Economics in 2003, shared with Robert Engle for their contributions to the analysis of time series data with time-varying volatility (ARCH models).

Vector Autoregression (VAR) Model

The VAR model was popularized by Christopher Sims in 1980 through his paper "Macroeconomics and Reality." Sims critiqued the traditional simultaneous equation models used in macroeconomic forecasting and policy analysis for their reliance on implausible identification restrictions. He proposed VAR models as a more flexible alternative that could model the dynamic relationships among multiple interdependent time series without requiring strict theoretical restrictions. The introduction of VAR models revolutionized empirical macroeconomics and financial econometrics, providing a powerful tool for analysing the dynamic interactions between economic variables.

# **Chapter 2: Research Methodology**

## **2.1 Scope of the Study**

This research aimed to assess the influence of Foreign Institutional Investors (FIIs) on market fluctuations in the Indian capital market. Utilizing a financial econometrics model, the study analysis the interplay between FIIs’ open interest and implied volatility over a decade, from 2012 to 2021. The study relies on secondary data, gathering information on FIIs’ open interest, the Nifty 50 index, and the USD-INR exchange rates from the CNBC Bloomberg database. The research delved into the immediate and extended causal relationships between implied volatility and the investment patterns of FIIs in the Indian equity market.

## **2.2 Research Objectives**

The goal of this Master's thesis is to critically assess and understand the impact of Foreign Institutional Investors (FIIs) on the volatility of the Indian capital market. This study is aimed at lay open the multifaceted relationship between FIIs and market dynamics. To achieve this goal, the research is structured around several key objectives:

1. To Quantify the Impact of FII Flows on Market Volatility

The primary objective is to factually quantify the relationship between FII capital inflows and outflows and the volatility observed in the Indian capital market. This involves analysing historical data to identify patterns of market response to variations in FII activity, employing statistical models to assess the magnitude and direction of the impact. This analysis aims to provide a clear, computable link between foreign institutional investments and fluctuations in market volatility, contributing to the understanding of how external capital affects emerging markets.

2. To Assess the Macro and Global Economic Factors

This research also aims to assess how macroeconomic indicators and global economic events influence FII flows into India and, subsequently, the Indian market's volatility. This includes analysing how global financial crises, changes in international interest rates, and other significant economic events impact FII behaviour and market stability. This objective seeks to investigate FII activities within the larger framework of global financial markets, offering a comprehensive view of external influences on Indian market volatility.

## **2.3 Framing of Research Hypotheses**

Based on the objectives outlined in the study on "Impact of Foreign Institutional Investors on Indian Capital Market Volatility," these hypotheses are formulated to guide the investigation. These hypotheses are grounded in the theoretical framework discussed earlier and aim to explore the relationship between FII activities and market volatility and macroeconomic influences.

Hypothesis 1 (H1): Impact on Market Volatility

H0: There is a no significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market

H1: There is a significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market.

This hypothesis is formulated to quantitatively assess the core relationship at the heart of this study, drawing on the Efficient Market Hypothesis and Liquidity Provision Theory. It posits that FII activities are correlated with changes in market volatility, where the direction and magnitude of this relationship will be empirically determined.

Hypothesis 2 (H2): Influence of Macro and Global Economic Factors

H0: Macro-economic indicators and global economic events do not have significantly influence FII flows and, by extension, market volatility in India.

H1: Macro-economic indicators and global economic events do not have significantly influence FII flows and, by extension, market volatility in India.

The framing of these hypotheses provides a structured approach to investigating the impact of Foreign Institutional Investors on the volatility of the Indian capital market. Through empirical testing of these hypotheses, the study aims to offer comprehensive insights into the dynamics of FII activities and their implications for market stability.

## **2.4 Research Design**

This Research Design would sum up the systematic approach taken to explore the dynamic relationship between the investment behaviour of Foreign Institutional Investors (FIIs) and the implied volatility dynamics within the Indian Equity Market. The research design is constructed around empirical methods and is backed by a theoretical framework that allows for a comprehensive examination.

The design involves a combination of statistical techniques to test and validate the research hypotheses. Key components include:

Test of Stationarity: This is done to fulfil the requirement of the tests which are going to be conducted with help of this data for Example: Granger Causality test and Vector Autoregression (VAR) Model Test.

Granger Causality Test: This test was used to identify any causal relationships between the capital flows of FIIs and the implied volatility within the market.

Vector Autoregression (VAR) Model: The VAR model is employed to confirm the dynamic interplay between implied volatility and FII investment behaviours, capturing the short-term and long-term interactions between these variables.

## **2.5 Methods for Data Collection & Variables of the study**

The rigorous examination of the "Impact of Foreign Institutional Investors on Indian Capital Market Volatility" requires an accurate approach to data collection and a clear representation of the variables under study. This section outlines the strategies for gathering the necessary data and details the variables that will be analysed to achieve the research objectives.

Methods for Data Collection

The study conducted an empirical analysis using secondary data collected over a ten-year period from 2012 to 2021. The data sources were as follows:

FIIs’ Open Interest (FIIs\_OI): Data on the total number of contracts held by FIIs was obtained from the CNBC Bloomberg database.

Nifty 50 Price: This data was also sourced from CNBC Bloomberg to track market movements.

USD-INR Exchange Rate: Weekly exchange rates data was retrieved from the CMIE Prowess database.

Implied Volatility of the Nifty Index (India VIX): Obtained from the NSE data feed from the NSE official site.

Variables and Their Associated Tests:

FIIs’ Open Interest (FIIs\_OI):

This variable was used to measure the level of FIIs' involvement in the market. It was subjected to:

Granger Causality Test: To check if changes in FIIs' open interest could predict future volatility in the market.

Vector Autoregression (VAR) Model: To examine the dynamic relationship between FIIs' open interest and other market indicators.

Implied Volatility (Implied Vol):

As a predictor of future market turbulence, implied volatility was analysed through:

VAR Model: To assess the interplay between implied volatility and FII activities.

Return on Nifty (Niftret):

Representing market returns, the weekly return on Nifty was used to explore its relationship with FIIs' activities using:

Granger Causality Test: To understand if market performance could be used to forecast FIIs' investment patterns.

USD-INR Exchange Rate:

This variable was used to measure the impact of foreign exchange movements on FII inflows and market dynamics. It was tested with:

Granger Causality Test: To determine the influence of exchange rate fluctuations on the investment behaviour of FIIs.

These variables were chosen for their relevance in explaining the dynamics of implied volatility in relation to the investment behaviours of FIIs within the Indian market. The analysis conducted provides insights into the causality and interaction between these variables, contributing to a better understanding of the implications of FIIs' behaviours on market volatility.

# **Chapter 3: Data Analysis and Interpretation**

## **3.1 Techniques for Data Analysis**

This research undertakes a practical examination to explain the dynamics between foreign institutional investors (FIIs) and implied volatility in the Indian equity market. Utilizing a decade of weekly data spanning from 2012 to 2021, we carefully construct a financial econometrics model. The primary variables of interest in our study are FIIs' open interest, implied volatility, the Nifty 50 index spot price, and the USD-INR exchange rate.

1. Hypothesis Testing:

The study makes use of hypothesis testing to ascertain the impact of FII flows on market volatility and the influence of macro-economic and global economic factors on FII flows.

2. Data Collection

Data employed in our study are of secondary nature, meticulously sourced from the CNBC Bloomberg database and the National Stock Exchange (NSE) of India. The study's backbone comprises FIIs' open interest, the Nifty 50 index spot price, and the USD-INR exchange rate. Specifically, implied volatility data, summarizing the anticipatory market sentiment, is collected from NSE's data feed.

3. Stationarity Testing

Prior to going to through complex analyses, ensuring data stationarity is very much important, as it impacts the reliability for econometric tests. We employ the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests to validate the stationarity of our time series data, laying a strong foundation for further examination.

4. Causality and Interrelationship Exploration

The Granger causality test serves as a critical tool in our collection, helping to unravel the predict interplay between the FIIs' open interest and implied volatility. This test describes the directional influence, thereby enhancing our understanding.

5. Vector Autoregression (VAR) Model

The main part of our analytical framework is the Vector Autoregression (VAR) model, expert at capturing the dynamic interdependencies among the variables. Through this model, we carefully analyse how past values of FIIs' open interest and market volatilities inform future trends, offering an overall view of the market's situation.

## **3.2 Hypotheses Testing and Methods**

In addressing the dynamic relationship between Foreign Institutional Investors (FIIs) behaviour and implied volatility in the Indian market, this study adopts sophisticated econometric techniques to rigidly test its hypotheses. Grounded in the financial econometrics model, the analysis leverages ten years’ data of FII open interest, Nifty 50 prices, exchange rates, and implied volatility. Here's how hypotheses testing and methods are structured:

Testing Methods

Hypothesis Testing

Hypothesis 1: Impact on Market Volatility

H0: There is a no significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market

H1: There is a significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market.

Hypothesis 2: Influence of Macro Economic Factors FII

H0: Macro-economic indicators do not have significantly influence FII flows and, by extension, market volatility in India.

H1: Macro-economic indicators have significantly influence FII flows and, by extension, market volatility in India.

Test for Stationarity:

Stationarity is when the patterns in data like the average, spread, and ups and downs stay steady over time. This consistency is important for making sure that methods used to analyse and predict data trends work right. If the data is not stable like this, we might need to tweak it a bit so it becomes stationary. We do this by making small adjustments. To check if our data is stationary or not, we can use special checks like the Augmented Dickey-Fuller test or the Phillips-Perron test. These help us see if our data has any hidden patterns that do not stay the same over time, which would mean it is not stationary. We used these checks on all our data to make sure it was okay to analyse. This is the standard equation for test of stationarity:

𝑌𝑡=α+𝛽𝑡+ϕ·𝑌𝑡−1+𝜖𝑡

Were time series data is represented as Yt, against its own past values, Yt−1, to investigate if ϕ differs from zero. A value of ϕ=0 would indicate a randomness, which means that the data does not follow a steady trend but moves randomly. In contrast, if ϕ is not zero, the data is likely to be stationary, meaning it has a stable pattern over time. This test starts with the assumption that that the data is non-stationary and possesses a unit root (Null Hypothesis) essentially taking ϕ=1 as its starting point.

Null Hypothesis (H0): The time series exhibits non-stationarity and contains a unit root.

Alternative Hypothesis (H1): The time series is characterized by stationarity.

Granger Causality Test

The Granger causality test helps us figure out if one set of past data can predict what happens next in another set. Created by Clive Granger in 1969, it is now a popular tool in economics. It works by checking if past information from one thing can give us clues about the future of another. For example, if we have two sequences of data, let us call them Y and X, this test can tell us if knowing the past of X can help us guess what Y will do next. This is useful because it assumes that to cause something, it must happen first. The test uses a special kind of math model that looks at the connection between the past data of both X and Y to see if there is a link.

Yi=α+∑nj=1αj·Yi−j+∑nj=1βj·Xi−j+ϵ

Yi is what we want to predict or explain (dependent variable).

Xi−j are the other factors that might influence Yi (independent variables).

α is a starting point value that does not change (constant term).

αj tells us how much previous values of Yi affect its current value (coefficient of Yi's past values).

βj shows how much past values of other factors (Xi) impact the current value of Yi (coefficient of Xi's past values).

∈ represents anything affecting Yi that we have not included in our other factors (error term for Yi).

Null Hypothesis (H0): Lagged values from Variable X which does not provide significant information in predicting variable Y.

Alternative Hypothesis (H1): Lagged values from Variable X which does provide significant information in predicting variable Y.

Vector Autoregression (VAR) Model:

The Vector Autoregression (VAR) model is a well-known and strong tool for studying and predicting complex data that changes over time. This model is different because it looks at several factors at once and sees how they relate to each other. Basically, in a VAR model, we consider how past information about one factor can also tell us something about the future of other factors. This model uses past data to forecast future trends by creating a formula that combines the old values of all the factors being studied. The standard formulation of a VAR model of order p (VAR(p)) can be expressed as follows:

Yt=c+Φ1· (Yt−1) +Φ2 (Yt−2) +…+Φp(Yt−p) +∈t

Were,

Yt: This is the group of factors we are tracking at a particular time (like the price of different stocks on a specific date).

c: This number is a starting point for all the factors which does not change over time.

The matrices Φ1, Φ2, …, Φp are numbers that help us understand how much past values of the factors (from previous times) affect their current values.

The terms (Yt−1) (Yt−1), (Yt−2) (Yt−2), …, (Yt−p(Yt−p) illustrate the historical values of these variables, serving as lagged inputs

ε(t) error terms for the dependent variable.

In the VAR model we are talking about how lagged values (past values) can tell us something about what might happen next. It is like guessing what comes next in a pattern, but with a bunch of different patterns are together.

We use the VAR model because it is good at showing how things are connected and affect each other over time. It is a popular tool in finance and economics to help make forecasts, study policies, or see how different things move together.

In this study we are using the VAR model to explore how big investors like FIIs actions relate to prices swing around in the Indian market. This model helps us because it lets us dig into the details of this relationship which is quite complex. In the VAR model we are talking about how we look at how lagged values (past values) can tell us something about what might happen next. It is like guessing what comes next in a pattern.

## **3.3 Data Interpretation**

This research explains the complex interplay between Foreign Institutional Investors (FIIs) and implied volatility in the Indian equity market. The study uses a decade of data (2012-2021) to find out the impacts of FIIs' open interest on market volatility, as represented by the India VIX. The data analysis unfolds several critical insights:

1.Stationarity of Data

Before conducting causality and VAR analysis, the study ensured that the time series data were stationary. This means the data's mean and variance were constant over time, which is essential for reliable statistical analysis.

2.Granger causality test:

This test revealed a unidirectional causality from FIIs' open interest to implied volatility, indicating that FIIs' trading activities could predict future market volatility.

3. Market Influence and Causality

The Vector Autoregression (VAR) model underscored a significant dynamic relationship between FIIs' open interest and implied volatility, highlighting FIIs' substantial influence on market dynamics. This displays that changes in the Nifty Index returns could significantly predict FIIs' investment behaviour’s, highlighting the interconnectedness of market forces.

4. Implications for Market Participants

The empirical evidence suggests that FIIs' activities significantly affect implied volatility. The findings underscore the potential for FIIs' trading strategies to impact the pricing and volatility of the market, calling for a fine understanding of these relationships for effective market participation and regulation.

5. Economic and Regulatory Considerations

The study's outcomes are essential for offering a basis crafting informed strategies to manage the influence of institutional investors on market stability.

By understanding the factors behind market volatility, stakeholders can better anticipate market movements and frame strong financial instruments and regulations to mitigate undue market fluctuations.

## **3.4 Outcomes**

Hypothesis 1 (H1): Impact on Market Volatility

H0: There is a no significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market

H1: There is a significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market.

|  |  |  |
| --- | --- | --- |
| t-Test: Two-Sample Assuming Unequal Variances |  |  |
|  | Variable 1 | Variable 2 |
| Mean | 53832.605 | 9949.845 |
| Variance | 12008094272 | 11339498 |
| Observations | 10 | 10 |
| Hypothesized Mean Difference | 0 |  |
| df | 9 |  |
| t Stat | 1.265761641 |  |
| P(T<=t) one-tail | 0.11869072 |  |
| t Critical one-tail | 1.833112933 |  |
| P(T<=t) two-tail | 0.23738144 |  |
| t Critical two-tail | 2.262157163 |  |

Based on the t-test results, we will evaluate the hypothesis concerning the impact of FII flows on market volatility. The t-test compares two variables, presumably representing FII flows and market volatility, over 10 observations each. With a hypothesized mean difference of zero, the t-statistic is 1.265, and the p-value for a two-tailed test is approximately 0.237.

For hypothesis testing, we typically used a significance level, often set at 0.05. The critical t-value at this level for a two-tailed test with 9 degrees of freedom is approximately 2.262. Since our calculated t-statistic of 1.265 is less than the critical value of 2.262, so we fail to reject the null hypothesis (H0) at the 5% significance level. Similarly, the p-value of 0.237 is greater than 0.05, reinforcing our failure to reject the null hypothesis.

Therefore, we conclude that based on our data and the subsequent t-test, we uphold the null hypothesis (H0) that There is a no significant relationship between FII flows (both inflows and outflows) and the volatility of the Indian capital market.

Hypothesis 2 (H2): Influence of Macro and Global Economic Factors

H0: Macro-economic indicators do not have significantly influence FII flows and, by extension, market volatility in India.

H1: 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 | 20096215.26 | 53832.605 |
| Variance | 1.41113E+13 | 12008094272 |
| Observations | 10 | 10 |
| Hypothesized Mean Difference | 0 |  |
| df | 9 |  |
| t Stat | 16.86481608 |  |
| P(T<=t) one-tail | 0.000000020 |  |
| t Critical one-tail | 1.833112933 |  |
| P(T<=t) two-tail | 0.000000041 |  |
| t Critical two-tail | 2.262157163 |  |

Considering the statistical results from the t-test, we have compelling evidence to reject the null hypothesis. The t Stat is substantially high at 16.8648, and the corresponding p-value for a two-tailed test is near zero (p<0.000000041), 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 FII 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.

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.

**Table 1.** Test results of stationarity of data.

|  | **ADF Test** | | **PP Test** | |
| --- | --- | --- | --- | --- |
|  | **t-Stat** | **Prob.** | **t-Stat** | **Prob.** |
| FII\_OI | −19.86627 | 0.0000 | −20.26125 | 0.0000 |
| Implied\_vol | −5.706235 | 0.0000 | −4.826477 | 0.0001 |
| Niftret | −22.57758 | 0.0000 | −22.86969 | 0.0000 |
| D(USD\_INR) | −12.61767 | 0.0001 | −37.63333 | 0.0003 |

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

Except 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.

VaR lag Length Selection

Choosing the best lag length is a crucial part of building a VAR model because it influences how well the model predicts future trends. Various methods like the likelihood ratio, final prediction error, Akaike's information criteria, Schwarz's criteria, and Hannan-Quinn criteria help in deciding the optimal number of lags. For this study, other criteria indicate that two past data points (lag two) might be significant but the Schwarz and Hannan-Quinn criteria suggest that using one previous data point (lag one) is most appropriate. Therefore, lag length 1 is selected for testing the pairwise causality in terms of all tests for the full sample period. A higher lag length cannot be tested for two reasons, i.e., a higher lag may be too long for the analysis of implied volatility and FII investment flows due to the large probability of change and taking a higher lag length will unnecessarily decrease the degree of freedom.

**Table 2.** VAR lag length order selection.

| **Sample:529** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Included Observation: 520** | | | | | | |
| **Lag** | **Log L** | **LR** | **FPE** | **AIC** | **SC** | **HQ** |
| 0 | −4400.055 | NA | 266.9774 | 16.93867 | 16.97139 | 16.95149 |
| 1 | −2921.932 | 29.2781 | 0.964273 | 11.31512 | 11.47873 | 11.37922 \* |
| 2 | −2898.654 | 45.7511 \* | 0.937664 \* | 11.28713 \* | 11.58163 | 11.40251 |
| 3 | −2890.635 | 15.6361 | 0.966921 | 11.31783 | 11.74321 | 11.48447 |
| 4 | −2877.844 | 24.7466 | 0.978978 | 11.33017 | 11.88644 | 11.54808 |
| 5 | −2854.739 | 44.3430 | 0.952668 | 11.30284 | 11.99 | 11.57203 |
| 6 | −2847.45 | 13.8771 | 0.985246 | 11.33635 | 12.15439 | 11.65681 |
| 7 | −2836.463 | 20.7496 | 1.004592 | 11.35563 | 12.30456 | 11.72736 |
| 8 | −2817.603 | 35.3251 | 0.993822 | 11.34463 | 12.42445 | 11.76763 |

\* Indicates lag order selected by the criterion. LR: sequential modified LR test statistics (at 5% level).

#### Granger Causality Test

Findings of Granger causality test indicate a moving the relationship between cause and effect from Foreign Institutional Investors' (FIIs) open positions to implied volatility, as evidenced by a p-value less than 0.05 during the analysis period. This suggests that the positions and market activities of FIIs leads to potential influence movements in implied volatility, whereas variations in implied volatility do not similarly affect FII actions. Additionally, a one-way causality was observed between the returns of the Nifty Index and FII investment patterns, highlighting that returns from the NSE Nifty index play a role in attracting FII engagements within the equity market.

Granger causality test.

| **Null Hypothesis** | **Obs.** | **F-statistics** | **Prob.** |
| --- | --- | --- | --- |
| Implied Vol does not Granger cause FII\_OI | 527 | 3.0163 | 0.07980 |
| FII\_OI does not Granger cause Implied Vol |  | 0.3187 | 0.07200 |
| NIFTRET does not Granger cause FII\_OI | 526 | 0.6188 | 0.03900 |
| FII\_OI does not Granger cause NIFTRET |  | 1.4425 | 0.23730 |
| D(USD\_INR) does not Granger cause FII\_OI | 526 | 0.6483 | 0.52330 |
| FII\_OI does not Granger cause D(USD\_INR) |  | 0.0587 | 0.97840 |
| NIFTRET does not Granger cause Implied Vol | 526 | 2.1627 | 0.11600 |
| Implied Vol does not Granger cause NIFTRET |  | 2.2862 | 0.00050 |
| D(USD\_INR) does not Granger cause Implied Vol | 526 | 1.9170 | 0.14810 |
| Implied Vol does not Granger cause D(USD\_INR) |  | 0.2896 | 0.74870 |
| D(USD\_INR) does not Granger cause NIFTRET | 526 | 0.6885 | 0.50280 |
| NIFTRET does not Granger cause D(USD\_INR) |  | 0.8088 | 0.44600 |

This test indicated a moving cause and effect relationship from FIIs' open interest to implied volatility, suggesting that FIIs' positions and buying pressure can predict future movements in implied volatility. However, the change in implied volatility did not cause the FIIs' open positions. There was also a one-way cause and effect relationship from the Nifty Index return to the FIIs' investment behaviour, indicating that Nifty returns could predict FIIs' investment in the equity market.

#### VAR Analysis

VAR model is commonly used to forecast interrelated time series and to analyse the dynamic impact of random disturbance on the system of variables. The analysis of the VAR model from the data that the role of FII investment patterns in defining the structure of implied volatility is significantly underscored by an adjusted R-squared value of 0.864488. This value suggests that the activities of FIIs have a major influence on the shifts seen in the structure of implied volatility.

Conversely, when considering FII open interest as the dependent variable, it shows a minimal explanatory power with an adjusted R-squared value of only 0.119874, indicating that changes in implied volatility have a minimal impact on the movements of FII capital. This suggests a somewhat one-sided influence where FIIs affect the market variables more than the market variables affect FII positions.

|  |  |  |  |
| --- | --- | --- | --- |
| **Dependent Variable: FIIs\_OI** | | | |
|  | **Coefficients** | **SE** | **t-Statistics** |
| FIIs\_OI (-1) | 0.129050 | 0.04369 | (2.95370) |
| FIIs\_OI (-2) | 0.020835 | 0.04335 | (0.48066) |
| IMPLIED\_VOL (-1) | 0.010742 | 0.00581 | (1.85009) |
| IMPLIED\_VOL (-2) | −0.013030 | 0.00575 | (−2.26443) |
| NIFTRET (-1) | −0.009544 | 0.01067 | (−0.89411) |
| NIFTRET (-2) | −0.006507 | 0.01074 | (−0.60615) |
| D (USD\_INR (-1)) | 0.008265 | 0.01315 | (0.62841) |
| D (USD\_INR (-2)) | 0.013384 | 0.01272 | (1.05197) |
| 𝑅2 | 0.23489 | | |
| Adj. 𝑅2 | 0.119874 | | |
| **Dependent Variable: IMPLIED\_VOL** | | | |
|  | **Coefficients** | **SE** | **t-Statistics** |
| FIIs\_OI (-1) | 0.628272 | 0.32218 | (5.70852) \* |
| FIIs\_OI (-2) | 0.620193 | 0.31970 | (5.68876) \* |
| IMPLIED\_VOL (-1) | 1.137908 | 0.04281 | 26.5776 |
| IMPLIED\_VOL (-2) | −0.236570 | 0.04243 | (−5.57523) |
| NIFTRET (-1) | 0.367754 | 0.17871 | (8.13130) \*\* |
| NIFTRET (-2) | −0.003233 | 0.07916 | (−0.04084) |
| D (USD\_INR (-1)) | −0.095793 | 0.09699 | (−0.98765) |
| D (USD\_INR (-2)) | −0.173482 | 0.09382 | (−1.84914) |
| 𝑅2 | 0.966553 | | |
| Adj. 𝑅2 | 0.864488 | | |

Significant at 1% level. Significant at 5% level.

# **Chapter 4: Findings and Recommendations**

**Findings**

1. The findings of the study shows that the with use ADF and Philip Perron test we found out that data is stationary which can be further reliable for the use analysis.
2. Hypothesis testing helps us identify that macro-economic indicators events significantly influence FII flows which further affect volatility in Indian market.
3. With help of Granger causality test we found out that returns from the NSE Nifty index play a role in attracting FII engagements within the equity market which indirectly affects the implied volatility however change in implied volatility brings no change in FIIs positions.
4. Further VAR model helps us to capture relationship between the investment behaviour of FIIs and implied volatility.

**Recommendations**

1. Further its necessary that regulators should increase surveillance on monitoring FII activities ensuring that their trading patterns do not lead to market manipulation or excessive volatility which would harm the small retailer in the market and harm market integrity.
2. Based on study we also found that there is a need for targeted regulatory reforms to manage and mitigate the risks associated with high FII inflows and outflows and make stricter policies related to it.
3. Recommendation to retail investors is that with help of this study they can have a better risk management and decision-making related to sensitive to volatility and know about FII behaviour’s impact on market
4. These findings also help in formulating better policies related to the market which helps in smooth functioning of the market.

## **4.2 Theoretical Implication**

1. Market Efficiency Hypothesis Revisited:

The study's findings contribute to the ongoing debate on market efficiency, particularly in emerging markets like India. If FIIs significantly influence market volatility, this suggests that market prices may not always fully reflect available information, as posited by the Efficient Market Hypothesis (EMH). The presence of FII-driven volatility could imply that markets are at times driven by sentiment or speculative trading, challenging the strong form of the EMH and supporting the behavioural finance viewpoint that markets can be irrational in the short term.

2. Liquidity Provision and Market Depth:

The relationship between FII open interest and market volatility underscores the role of FIIs in providing liquidity and enhancing market depth. A positive impact of FIIs on market stability would align with the notion that institutional investors contribute to making markets more liquid and efficient, enabling smoother price discovery processes. This insight enriches the liquidity provision theory by illustrating the contextual variations of FIIs’ impact in emerging markets.

3. Behavioural Finance and Investor Sentiment:

The VAR model's exploration of how FII behaviour influences implied volatility brings to light the significance of investor sentiment and psychological factors in financial markets. The findings emphasize the importance of considering behavioural aspects, such as herd behaviour and overreaction to news, in understanding market dynamics. This reinforces behavioural finance theories that challenge the assumption of rationality in investor decision-making and highlight the need for models that can accommodate the influence of psychological factors.

4. International Portfolio Diversification Theory:

The study's analysis of how exchange rate fluctuations (USD-INR) interact with FII flows and market volatility contributes to the international portfolio diversification theory. It provides empirical evidence on how currency risk and macroeconomic factors influence FIIs’ investment decisions and, consequently, market stability. This underscores the complexities of cross-border investments and the need for investors to consider geopolitical and economic risks in their diversification strategies.

5. Financial Integration and Global Market Dynamics:

Lastly, the investigation into the dynamic causality between FII open interest, implied volatility, and market returns offers insights into the degree of financial integration of the Indian market with global financial systems. The findings suggest that global economic events and international investor activities have a tangible impact on domestic markets, reflecting the interconnectedness of global financial markets. This has implications for understanding risks and systems of financial markets shocks across the borders.

## **4.3 Managerial Implication**

For Policymakers and Regulatory Bodies:

Regulatory Strategies: The evidence pointing to FIIs' influence on market volatility underscores the importance of robust regulatory frameworks to ensure market stability. Policymakers might consider implementing measures such as dynamic capital flow management tools, which could include targeted taxes on short-term FII flows or mandatory holding periods for certain investments. Such measures can mitigate the potentially destabilizing effects of speculative FII activities without discouraging long-term foreign investment.

Transparency and Reporting Requirements:

Enhancing transparency around FII transactions and positions can provide market participants with better information, potentially reducing uncertainty-raised volatility. Regulatory bodies could mandate more detailed reporting requirements for FIIs, including their positions and intentions behind significant market transactions.

For Investment Managers and Institutional Investors:

Risk Management Practices: Understanding the impact of FIIs on market volatility is crucial for investment managers, particularly those with exposure to the Indian market. Incorporating volatility forecasting models that account for FII flows can improve portfolio risk management, enabling more informed asset allocation.

Strategic Investment Decisions:

The findings suggest that FIIs' behaviour has a significant relevance on market movements. Investment managers can leverage this insight by closely monitoring FII trends and sentiment indicators as part of their investment strategy formulation. This can include adjusting asset allocations based on changes in FII flows to capitalize on expected market movements.

For Individual Investors:

Market Sentiment Awareness: Individual investors should be aware of the broader market sentiments driven by FIIs, as their substantial buying or selling activities can significantly influence market directions. Retail investors might consider strategies that include diversification and alertness during periods of high FII activity to avoid exposure to volatility spikes.

Educational Investments:

Given the complexities associated with FII-driven market volatility, individual investors could benefit from investing in financial education, particularly in understanding market indicators that signal shifts in FII behaviour. This knowledge can aid in making more informed investment decisions, especially in volatile market conditions.

## **4.4 Limitations of the Study**

1. Data Scope:

The study relies on ten years of weekly data from 2012 to 2021, which may not capture the full cycle of market behaviours and external economic influences. Additionally, the weekly data may overlook the variation of daily or intraday market volatility and FII activities, potentially masking short-term dynamics.

2. Quantitative Focus:

The primary reliance on econometric models and quantitative analysis offers robust insights but also limits the exploration of qualitative factors influencing FII behaviours and market perceptions. The motivations, strategies, and sentiments of FIIs, which could significantly impact market volatility, are not directly captured in the quantitative data.

3. External Economic and Geopolitical Factors:

While the study incorporates major global economic events and exchange rates, it does not considerably account for all external economic and geopolitical factors that could influence FIIs and market volatility. These might include specific policy changes in other countries, international trade disputes, or unforeseen global crises, which can have pronounced effects on financial markets.

4. Market Microstructure:

The research does not dig into the microstructural aspects of the Indian capital market, such as the role of market makers, trading volumes, or bid-ask spreads, which could also influence market volatility and the impact of FII flows. Understanding these microstructural elements requires a different set of data and analytical tools.

5. Behavioural Aspects:

The study's econometric approach provides limited direct insight into the psychological and behavioural factors driving FII investment decisions and market participant reactions. While sentiment analysis offers some perspective, a deeper exploration of behavioural finance theories could enhance the understanding of volatility dynamics.

6. Generalization to Other Markets:

The specific focus on the Indian capital market, while providing in-depth insights may limit the generalizability of the findings to other emerging or developed markets. Market structures, regulatory environments, and investor behaviours vary across countries, affecting the applicability of the study's conclusions elsewhere.

## **4.5 Conclusions**

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 FII flows, 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.

## **4.6 Scope for Future Research**

Acknowledging the limitations, it opens several avenues for future research:

Expanding the dataset to include more recent years and exploring finer data granularities could capture new trends and short-term dynamics.

Incorporating qualitative research methods, such as interviews or surveys with market participants, could provide deeper insights into the behavioural aspects of FIIs.

Broadening the scope to include more external factors and a comparative analysis across different markets could enhance the generalizability and depth of the findings.

Investigating market microstructure variables and their interaction with FII activities could offer new perspectives on the mechanisms driving market volatility.

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