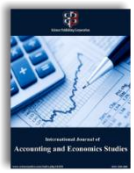
International Journal of Accounting and Economics Studies, 12 (SI-1) (2025) 291-296

International Journal of Accounting and Economics Studies

Website: www.sciencepubco.com/index.php/IJAES
https://doi.org/10.14419/ggy30r95
Research paper



The Relationship between Financial Market Volatility and Macroeconomic Indicators

Dr. Duryodhan Jena [1] *, Dr. Moli Ghosh [2], V. Haripriya [3], Sanjay Bhatnagar [4], Divya Sharma [5], Rashmi [6], Dr. Varsha Agarwal [7]

[1] Professor, Department of Management, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India.
[2] Assistant Professor, Master of Business Administration, Sathyabama Institute of Science and Technology, Chennai, Tamil Nadu, India.
[3]Assistant Professor, Department of CS & IT, Jain (Deemed-to-be University), Bangalore, Karnataka, India.
[4] Centre of Research Impact and Outcome, Chitkara University, Rajpura, Punjab, India.
[5] Chitkara Centre for Research and Development, Chitkara University, Himachal Pradesh, India.
[6] Assistant Professor, Maharishi School of Business Management, Maharishi University of Information Technology, Lucknow, Uttar Pradesh, India.
[7] Director, ISME, ATLAS SkillTech University, Mumbai, India.
**Corresponding author E-mail: duryodhanjena@soa.ac.in*

Received: May 28, 2025, Accepted: June 4, 2025, Published: August 28 2025

Abstract

Economists and experts in finance have recently focused more on the connection between the stock market and the actual economy. Indeed, it is difficult to envision a world without stock markets currently. The operations in the stock markets and their connections to the macro economy have taken on a great deal of significance in the current situation, which is characterized by the growing interconnectedness of the financial markets and the execution of different stock market reform measures. This research aims to investigate the relationship between stock prices and several carefully chosen macroeconomic indicators. Before that, it's critical to appreciate the significance of the nation's stock market and stock prices. According to financial theorists, the share price is calculated by dividing the number of outstanding shares by the present value of all projected future earnings for the company. This implies that price is determined by the company's earning potential. Additionally, the market's estimate of a company's earnings potential is influenced by several elements, including the possible earnings in the future, the potential growth, and the time it will take to achieve those goals. All available information about a firm and its potential for future profitability is reflected in its price. Prices fluctuate as information about a company's future becomes available to the public. But future uncertainty can increase volatility, and psychological variables can intensify the impact of fresh knowledge.

Keywords: *Financial Market; Volatility; Macroeconomic Indicators; Stock Market.*

1. Introduction

Essentially, volatility refers to the range of possible outcomes for something uncertain. It can capture the idea of inconsistency or unsteadiness (Sharma & Rajput, 2024). In finance, volatility is often defined as sudden shifts or fluctuations in the prices of assets (Mushtaq et al., 2011). If a variable shows significant increases or decreases compared to its average value, it's considered volatile (Jaya Priya & Kanimozhi, 2015). You can see this kind of behaviour in stock prices, exchange rates, inflation rates, and similar metrics (Lee et al., 2010). Return volatility is crucial in financial economics, closely tied to the concepts of risk and uncertainty, and sometimes these terms are used interchangeably (Duhaim et al., 2024). However, while volatility relates to risk, they aren't quite the same. Risk deals with the uncertainty of negative outcomes, while volatility measures the range of all possible outcomes, both positive and negative. In financial risk management, volatility is a key factor in pricing options and derivatives (Ahmad & Ramzan, 2016). Models like the Black-Scholes and Binomial Tree are widely used to evaluate major classes of derivatives such as options, futures, forwards, and swaps (Oluseyi, 2015). All these approaches really focus on the ups and downs in the pricing of the products mentioned (Zakaria & Shamsuddin, 2012). Volatility forecasting plays a crucial role in financial metrics like the Sharpe ratio, which helps us compare how well investments are performing, and it's also key in risk management tools like Value at Risk (VaR) (Oseni & Nwosa, 2011; Mousa & Rasheed, 2022).

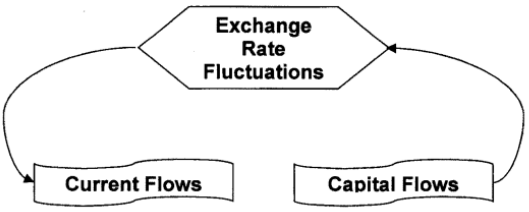


Fig. 1: Cause & Effect for Exchange Rate Fluctuations

2. Materials and Methods

Now, when we talk about a stock's beta, we're referring to its volatility in relation to the market, while alpha represents the volatility that comes from factors within the company itself, independent of market movements (Czapkiewicz et al., 2018). High volatility can often signal some kind of market disruption, suggesting that assets aren't being valued fairly and that the capital market isn't functioning as it should. Modern financial theory revolves around the balance between risk and the expected return, as seen in models like the Arbitrage Pricing Model (APT), Capital Asset Pricing Model (CAPM), and Option Pricing Theory (Hakimov et al., 2024). In all these frameworks, volatility plays a crucial role in determining security's fair value (Ayopo et al., 2016).

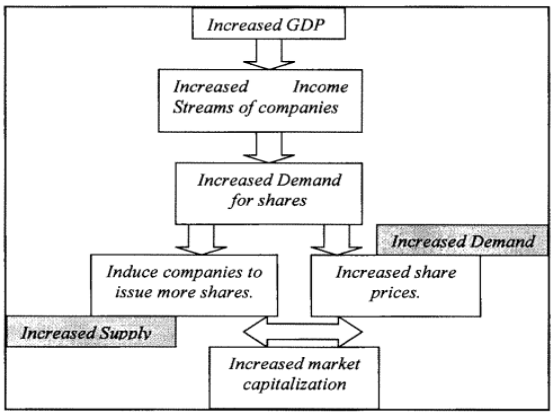


Fig. 2: GDP Propelling Financial Growth

Volatility is all about measuring how much a trend swings, but it doesn't tell us which way it's headed. This happens because when we calculate standard deviation (or variance), we square all the differences, which means both positive and negative changes get lumped together into one number. So, even if two different securities have the same expected return, the one with higher volatility will experience bigger price swings over time.

You could think of volatility to show how much a certain variable can change. It's closely tied to unpredictability and uncertainty. In stock market discussions, "volatility" often gets mixed up with "risk," and when volatility is high, it usually signals that the market is a bit shaky—suggesting that securities might not be priced right and that the capital market isn't functioning as smoothly as it should. While the concept of volatility is pretty straightforward, as it measures how spread out values are around an average, it can be tricky to analyse and apply due to some unique challenges. Ultimately, volatility plays a key role in assessing the risk versus return balance, as it's a common sign of financial instability (Olokoyo et al., 2020; Chowdhury & Rahman, 2004; Sabour & Vazifeh, 2018).

This study used monthly data from January 2010 to December 2023, sourced from the World Bank, IMF Data Portal, and NSE. Key variables include inflation rate, GDP growth, repo rate, INR/USD exchange rate, and Nifty 50 index returns. Analytical techniques include ADF tests for stationarity, Johansen cointegration to assess long-run relationships, and GARCH/EGARCH models to capture volatility clustering. Granger causality tests were applied to determine directional influence among variables.

3. Results And Discussion

Comparative insights with Brazil, South Africa, and Indonesia reveal that similar macroeconomic indicators, particularly inflation and exchange rate volatility, drive stock market fluctuations, validating the broader applicability of our findings. However, India demonstrates relatively higher sensitivity to foreign institutional investments (FIIs), underlining its unique capital flow structure. When making important financial and economic decisions, there are a few key factors to keep in mind, such as risk management, asset pricing, and portfolio allocation. One major aspect to consider is how asset prices and market volatility react to new information about fundamental variables. Since most price and volatility changes are driven by trades based on information, the way this information arrives can really shape those reactions. Researchers have looked at various types of stochastic processes to understand the link between price changes and how information comes in. This includes broader stochastic time changes discussed by Ane and Geman, as well as the subordinated processes introduced by Clark in 1973.

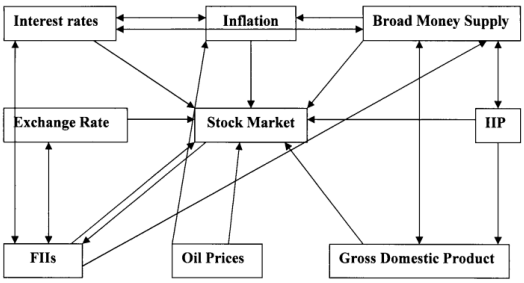
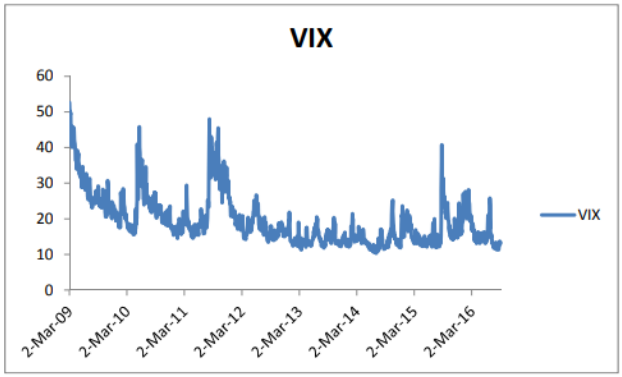
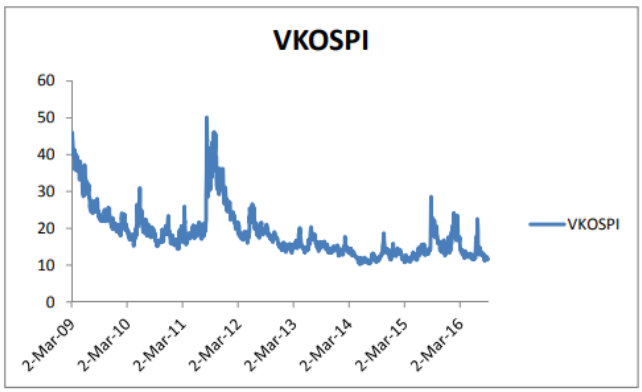


Fig. 3: Macroeconomic Indicators Determining Stock Price Movements

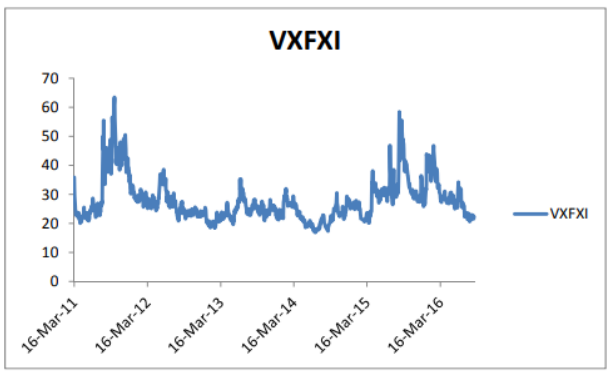
In this context, the steady flow of relevant data suggests that there are time variations happening at high frequencies. Additionally, the returns process tends to be continuous when the information arrival is also "continuous." On the flip side, the pricing process can experience noticeable "jumps" when there are sudden breaks in the flow of information. The jump-diffusion model is the simplest example of a model that incorporates these jumps, which occur when the total information arrival has a limited number of discontinuities over a set period. In this scenario, spikes in activity are often associated with times of heightened market activity, such as during financial crises.



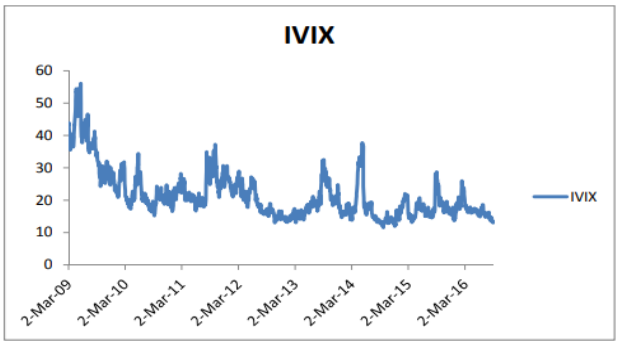
(a)



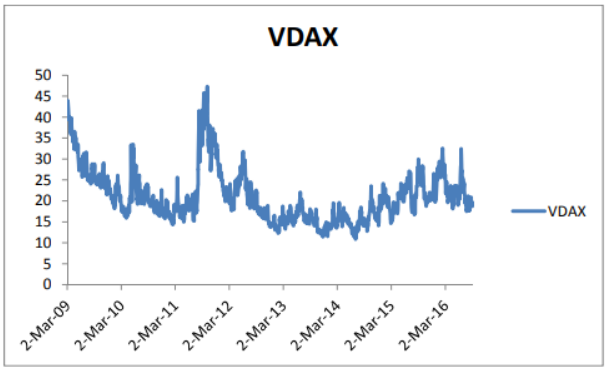
(b)



(c)



(d)



(e)

Fig. 4: Performance Comparison of Desired Values

Risk often shows itself through volatility, which is a big concern for anyone dealing with money, whether they're investing in the stock market or other financial tools. In recent years, worries about volatility have become increasingly important for researchers, regulators, retail investors, market participants, and financial professionals.

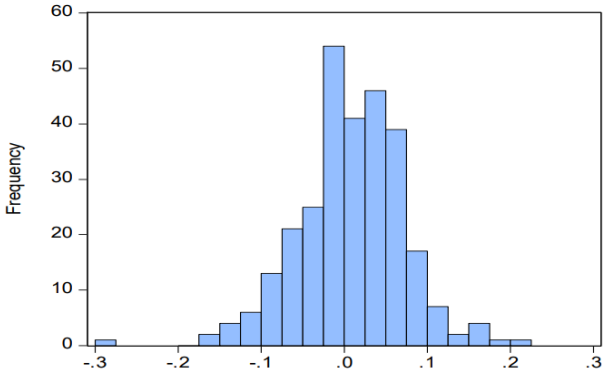


Fig. 5: Sensex Returns"s Distribution

For most people, risk and volatility are pretty much the same thing. They tend to view high volatility negatively, seeing it as a sign that capital markets aren't working properly and that security values are shaky. The link between global economic factors and stock market volatility is a complicated topic that needs more exploration. While it's clear that economic variables can impact stock market volatility, the exact nature and extent of these relationships are still up for debate (Paye, 2012).

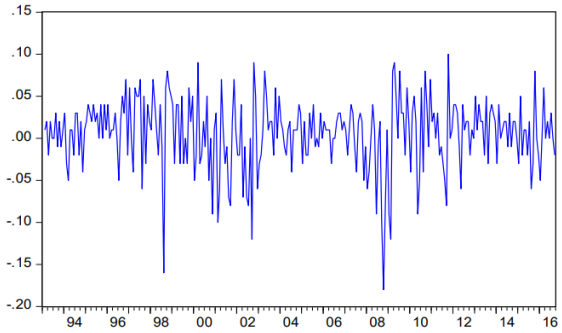


Fig. 6: Time series Plots of Growth Rate or Return of FII

Recent global crises, particularly the COVID-19 pandemic (2020–2021) and the inflationary surge that followed (2022–2023), have significantly reshaped volatility dynamics in financial markets. GARCH model results during these periods indicate increased volatility clustering and persistent fluctuations, reflecting heightened investor uncertainty and rapid shifts in monetary policy. The pandemic led to abrupt information shocks, while the inflation surge triggered capital outflows and policy-driven volatility, especially in emerging economies like India. Factors like rising interest rates, high inflation due to stable global crude oil prices, an economic slowdown, fluctuations in corporate earnings, currency market volatility, slow economic reforms, political unrest, a general decline in asset values, political tensions, and even the threat of terrorism all play a role in stock price volatility. It's interesting to note that psychological factors can sway market movements just as much as political, economic, social, and, most importantly, behavioural factors.

4. Conclusion

A key insight from modern asset pricing theory is that every risky asset faces two main types of risk: idiosyncratic risk, which is specific to each asset, and systematic risk, which affects all risky assets in the financial market. Recent studies have underscored the importance of idiosyncratic risk in asset pricing and management, even though systematic risk continues to play a major role. Unlike systematic risk, idiosyncratic risk can vary quite a bit. This variability makes it essential to explore how idiosyncratic volatility impacts asset pricing. For starters, many investors hold undiversified portfolios, making idiosyncratic risk particularly relevant. Market fluctuations and shocks from specific companies or industries can significantly affect these investors. Therefore, understanding these risk factors can provide valuable insights into the challenges facing individual companies and the risks associated with the portfolios they make up, especially from a portfolio management perspective. Gaining a clearer understanding of these two types of risks in default prediction is expected to greatly influence how most financial institutions approach the New Basel Accord II. When crafting credit portfolio management strategies, it's vital to weigh the trade-offs between systematic and idiosyncratic risks. Considering both types of risks at the individual firm level is essential.

References

[1] Adeniji, O. S. (2015). An empirical investigation of the relationship between stock market prices volatility and macroeconomic variables' volatility in Nigeria. European Journal of Academic Essays, 2(11), 1–12.

[2] Ahmad, N., & Ramzan, M. (2016). Stock market volatility and macroeconomic factor volatility. International Journal of Research in Business Studies and Management, 3(7).

[3] Ayopo, B. A., Isola, L. A., & Somoye, R. O. (2016). Stock market volatility: Does our fundamentals matter. Ikonomicheski Izsledvania, 25(3), 33–42.

[4] Chowdhury, S. S. H., & Rahman, M. A. (2004). On the empirical relation between macroeconomic volatility and stock market volatility of Bangladesh. The Global Journal of Finance and Economics, 1(2), 209–225.

[5] Czapkiewicz, A., Jamer, P., & Landmesser, J. (2018). Effects of macroeconomic indicators on the financial markets interrelations. Finance a Uver: Czech Journal of Economics & Finance, 68(3).

[6] Duhaim, S. M., Taleb, D., & Ghadhban, Z. H. (2024). The quality learning system interface factor of success blended learning. International Academic Journal of Science and Engineering, 11(1), 262–264. https://doi.org/10.9756/IAJSE/V11I1/IAJSE1130

[7] Hakimov, N., Karimov, N., Reshetnikov, I., Yusufjonova, N., Aldasheva, S., Soatova, N., Eshankulova, S., & Bozorova, D. (2024). Mechanical marvels: Innovations in engineering during the Islamic Golden Age. Archives for Technical Sciences, 2(31), 159–167. https://doi.org/10.70102/afts.2024.1631.159

[8] Jaya Priya, M., & Kanimozhi, M. (2015). Removal of chromium (VI) from contaminated water using concentrates of leaves or their ashes of herbal plants. International Journal of Advances in Engineering and Emerging Technology, 6(1), 122–132.

[9] Lee, K., Yeuk, H., Choi, Y., Pho, S., You, I., & Yim, K. (2010). Reverse-safe authentication protocol for secure USB memories. Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, 1(1), 46–55.

[10] Mousa, M. J., & Rasheed, M. K. (2022). Testing the Quality of Forecasting Using the Theils U Statistics for Forecasting the Production Capacity of Crude Oil in Iraq Until 2033. International Academic Journal of Social Sciences, 9(2), 1–7.

[11] Mushtaq, R., Rehman, M. Z. U., Shah, S. Z. A., & Murtaza, G. (2011). The relationship between stock market volatility and macroeconomic volatility: Evidence from Pakistan. SSRN. https://doi.org/10.2139/ssrn.1885329

[12] Olokoyo, F. O., Ibhagui, O. W., & Babajide, A. (2020). Macroeconomic indicators and capital market performance: Are the links sustainable? Cogent Business & Management, 7(1), 1792258. https://doi.org/10.1080/23311975.2020.1792258

[13] Oseni, I. O., & Nwosa, P. I. (2011). Stock market volatility and macroeconomic variables volatility in Nigeria: An exponential GARCH approach. Journal of Economics and Sustainable Development, 2(10), 28–42.

[14] Paye, B. S. (2012). 'Déjà vol': Predictive regressions for aggregate stock market volatility using macroeconomic variables. Journal of Financial Economics, 106(3), 527–546. https://doi.org/10.1016/j.jfineco.2012.06.004

[15] Sabour, M. P., & Vazifeh, Z. (2018). Study the relationship between organizational change and strategic planning of human resources. International Academic Journal of Organizational Behavior and Human Resource Management, 5(2), 85–98.

[16] Sharma, N., & Rajput, A. (2024). Development of a genomic-based predictive model for warfarin dosing. Clinical Journal for Medicine, Health and Pharmacy, 2(2), 11–19.

[17] Zakaria, Z., & Shamsuddin, S. (2012). Empirical evidence on the relationship between stock market volatility and macroeconomics volatility in Malaysia. Journal of Business Studies Quarterly, 4(2), 61.

[18] Sadulla, S. (2024). Techniques and applications for adaptive resource management in reconfigurable computing. SCCTS Transactions on Reconfigurable Computing, 1(1), 6-10. https://doi.org/10.31838/RCC/01.01.02

[19] Arun Prasath, C. (2025). Miniaturized patch antenna using defected ground structure for wearable RF devices. National Journal of RF Circuits and Wireless Systems, 2(1), 30–36.

[20] Velliangiri, A. (2025). An edge-aware signal processing framework for structural health monitoring in IoT sensor networks. National Journal of Signal and Image Processing, 1(1), 18–25.

[21] Veerappan, S. (2025). Harmonic feature extraction and deep fusion networks for music genre classification. National Journal of Speech and Audio Processing, 1(1), 37–44.

[22] Sathish Kumar, T. M. (2025). Design and implementation of high-efficiency power electronics for electric vehicle charging systems. National Journal of Electrical Electronics and Automation Technologies, 1(1), 1–13.

[23] Prabhakar, C. P. (2024). Digital twin-based optimization models for intelligent industrial systems. Electronics, Communications, and Computing Summit, 2(3), 9–17.

[24] Kavitha, M. (2025). Breaking the silicon ceiling: A comparative analysis of women's leadership and participation in AI startups across global innovation hubs. Journal of Women, Innovation, and Technological Empowerment, 1(1), 1–6.

[25] Surendar, A. (2025). Coordinated Control of Bidirectional EV Chargers for Grid Stability in High-Density Urban Networks. National Journal of Intelligent Power Systems and Technology, 1(1), 1-11.
[26] Fu, W., & Zhang, Y. (2025). The role of embedded systems in the development of smart cities: A review. SCCTS Journal of Embedded Systems Design and Applications, 2(2), 65–71.
[27] Maria, E., Sofia, K., & Georgios, K. (2025). Reliable data delivery in large-scale IoT networks using hybrid routing protocols. Journal of Wireless Sensor Networks and IoT, 2(1), 69-75.
[28] Abdullah, D. (2025). Nonlinear dynamic modeling and vibration analysis of smart composite structures using multiscale techniques. Journal of Applied Mathematical Models in Engineering, 1(1), 9–16.
[29] Netkachev, A., & Kamireddi, V. R. (2022). An overview on basics of computational fluid dynamics. Journal of Artificial Intelligence in Fluid Dynamics, 1(1), 21–30.
[30] Al Freijat, S. Y., Almaaitah, N. K., & Al-Trawneh, H. A. (2025). Advantages of The Digital Economy from The Point of View of Economic Specialists. Calitatea, 26(204), 7-16.