**International Journal of Environmental Sciences**
ISSN: 2229-7359
Vol. 11 No. 7s, 2025
https://www.theaspd.com/ijes.php

# Macroeconomic Factors and Stock Market Performance in India: A Cointegration Analysis

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***Abstract***
*This study focuses on relation between macroeconomic variables and the Indian stock market (NIFTY 50) under long-term and short-term through the application of cointegration and vector error correction models (VECM). This study opted Monthly data from January 2003 to December 2024which is being analysed by R studio analyzed to assess the impact of disposable income (DI), foreign institutional investment (FII), Gross development products GDP, inflation, interest rates, exchange rates, and government policies (GP) on stock market performance. Results confirm significant cointegration, indicating a stable long-run equilibrium. Short-term dynamics are driven by FII inflows, GDP growth, and interest rate fluctuations. The error correction term reveals a 32% monthly adjustment to equilibrium. These findings provide actionable insights for investors and policymakers to enhance market efficiency and macroeconomic stability.*
***Keywords***: *Cointegration, VECM, NIFTY 50, macroeconomic determinants, stock market efficiency.*

## 1. INTRODUCTION

The Indian stock market, epitomized by the NIFTY 50 index, has evolved into an effective indicator of economic health, attracting global investors and policymakers. Over the past two decades, India's equity market has grown exponentially where growth rate of equity market has grown exponentially where growth rate is one of the highest among emerging economies, driven by robust domestic consumption and increasing foreign investments. Such remarkable expansion has attracted a diverse range of investors, leading to greater market liquidity and the emergence of innovative financial products tailored to meet varying investment needs. (Chandrashekar & Eleswarapu, 2017) As a result, the Indian stock market has become an increasingly attractive destination for both local and international investors seeking opportunities in a rapidly evolving economic landscape. (Mukherjee, 2012) where market capitalization surging from 320 billion in 2003 to over 3.5 trillion in 2023, reflecting its integration into global financial systems (Reserve Bank of India, 2023). This growth has been motivated by robust GDP expansion (averaging 6-7% annually), a demographic dividend with a median age of 28 years, and transformative regulatory reforms such as the Goods and Services Tax (GST) and the Insolvency and Bankruptcy Code (IBC). These factors collectively position India's equity market as a barometer of emerging market potential, offering insights into macroeconomic stability and investor sentiment. Previous studies where they examined and principally focused on conventional macroeconomic drivers such as GDP, inflation, and interest rates (Singh &Pattanaik, 2020; Chakraborty & Mukherjee, 2019). Such as, Singh and Pattanaik (2020) demonstrated bidirectional causality between GDP growth and NIFTY returns, while Chakraborty and Mukherjee (2019) highlighted inflation's adverse impact on equity performance. In this study we have explored critical gaps to understand **collective influence** of all previously examined variables such as **disposable income**, **foreign institutional investments (FII)**, and **government policies** on market dynamics. Disposable income, reflecting household consumption capacity, remains underexplored despite its role in driving corporate profitability (Sahu& Kumar, 2021). Other studies focused on FII inflows and recognized FII as liquidity catalysts (Dash &Mahakud, 2020) and studied their relation with policy reforms such as GST or monetary easinghas not been systematically analyzed in the Indian context.

This study employed a **cointegration framework** to analyze collectively macroeconomic variables under long-term equilibrium and short-term dynamics between and the NIFTY 50. Where this study focused on monthly data from 2003 to 2024, the research integrates exclusive variables: such as Disposable **income** (monthly household income data from RBI surveys), **Government policies** (proxied by dummy variables for structural reforms like GST and demonetization), **FII flows** (net monthly investments from SEBI), alongside traditional variables (GDP, CPI, interest rates, and exchange rates). Where cointegration approach, coupled with a **Vector Error Correction Model (VECM)**, is particularly applied for this analysis. Where VECM distinguishes between short-term shocks and long-term equilibrium adjustments, and give explanation on how macroeconomic variables interact with stock market performance (Ahmed, 2019). This methodology also mitigates risks of spurious regression, common in non-stationary time-series data (Patra&Poshakwale, 2016).

## 2. LITERATURE REVIEW

The relationship between macroeconomic variables and stock markets has been extensively studied through various models where mixed findings occurred in emerging economies. where Economic **Growth (GDP)**Gross Domestic Product (GDP) is a fundamental driver of stock market performance. (Levi et al., 2016) several studies show how Higher GDP growth rates often correlate with increased corporate earnings, which in turn can lead to rising stock prices and heightened investor confidence. (Tripathi & Seth, 2014), Singh and Pattanaik (2020) identified a bidirectional relationship between GDP and NIFTY returns, attributing it to corporate earnings growth during economic expansions. (Bernstein & Arnott, 2003) whereas Mishra and Das (2018) found GDP growth to explain 22% of stock market volatility in BRICS nations. While **Inflation and Interest Rates** Inflation erodes purchasing power, while interest rates influence borrowing costs. (DeBoeuf et al., 2018) Chakraborty and Mukherjee (2019) demonstrated that rising CPI in India negatively impacts equity returns, as higher inflation triggers monetary tightening. Conversely, low interest rates correlate with bullish markets due to cheaper capital (RBI Bulletin, 2021). Relationship between macroeconomic factors and stock market performance shows the importance of monitoring economic indicators which help investors seeking to optimize portfolios returns. Foreign Institutional Investment (FII) plays a crucial role in shaping emerging markets. Dash and Mahakud (2020) highlight fluctuations in FII account nearly 18% of NIFTY movements, underlining its importance in ensuring liquidity. Other study of Agarwalla and Pandey (2015) warn against excessive dependence on FII, can easily disrupt domestic markets in the case of global financial turbulence in case of Disposable Income and Government Policies, consumer spending power indirectly fuels corporate earnings. According to Sahu and Kumar (2021), 1% increase in urban disposable income contributes to a 0.15% rise in NIFTY. Policy decisions significantly influence market sentiment. Implementation of GST in 2017 initially led to market instability but ultimately brought long-term stability (Mehta & Sinha, 2019). Methodological approaches like Cointegration and VECM are extensively used for modelling non-stationary time series. Ahmed (2019) applied these techniques to ASEAN markets and established a stable long-term link between macroeconomic indicators and equity indices. In the Indian context, Johansen's cointegration test has proven effective for evaluating stock market relationships (Patra & Poshakwale, 2016). Macroeconomic variables and stock market performance relationships has been thoroughly examined, in emerging economies like India. Keswani, Puri, and Jha (2024) adopted cointegration methods to confirm a robust long-term correlation between GDP, disposable income, FII, and stock market returns. Various studies stated that GDP and DI positively impacted on NIFTY 50, while other factors such as interest rates, inflation, and exchange rates tend to exert downward pressure. Other studies reinforce this connection. Singh Jaya (2024) used panel data analysis to explore sector-specific indices, proved GDP growth is a key driver of stock market trends. Other study done by Naik (2024) investigated foreign portfolio investments (FPI), industrial production, and exchange rates, finding that shows positive corelation between FPI inflows and NIFTY 50 fluctuations. In other studies, like Vinodraj and Prathibha (2024) shows in their study that economic indicators directly shape stock price trends and investor behavior. Whereas Hedau (2024) showed a more holistic approach, in which he examined the

impact combinedly on domestic and global factors to forecast movements of NIFTY 50. Above studies proved that there is an important role of capital that sourced are international to influence market and market voltality volatility. Macroeconomic monitoring is critical for making informed investment decisions. Studies found that exchange rate fluctuations and worldwide economic conditions significantly affect stock market returns. In short, these findings stress the need for macroeconomic stability to ensure market efficiency and investor confidence. Indian economy is continue evolving in this case balancing domestic growth with global financial trends will be essential for sustaining a resilient stock market.

**2.1 Hypothesise development**

**2.2 *H01: There is no cointegration exists in Macroeconomic variables***

The integration of macroeconomic variables has been extensively examined in economic and financial literature. Studies employing cointegration analysis indicate that macroeconomic variables often exhibit long-term equilibrium relationships, contradicting the assumption of non-integration. For instance, Keswani, Puri, and Jha (2024) conducted a cointegration analysis on the Indian stock market, concluding that variables such as GDP, disposable income, and foreign institutional investment (FII) demonstrate a statistically significant long- term association with stock returns. Similarly, Shaikh and Soomro (2023) applied the Nonlinear Autoregressive Distributed Lag (NARDL) approach, revealing that economic policy uncertainty and macroeconomic indicators exhibit asymmetric long-term cointegration with stock returns in Pakistan. In short above-mentioned studies and their findings challenge hypothesis and claimed that macroeconomic variables are not integrated to economic indicators maintaing long-term dependencies**.**

***H02*: *There is a positive long-term relationship exists among disposable income (DI), foreign institutional investment (FII), GDP, and NIFTY returns*.**

Empirical evidence shows a support positively to make a statement that macroeconomic variables affect stock market returns in long term. Keswani et al. (2024) found that GDP, DI, and FII flows positively correlate with stock prices in India. along with this is also reinforcing the role of economic fundamentals in market performance. Shanu and Pandey (2024) further established that FPI/FII flows shows moderate positive correlation with Stock returns that highlighted impact of foreign investments on stock market performance. Such studies included broader financial literature and amplifying this statement that long-term economic growth indicators, such as GDP and disposable income, enhance stock market returns by fostering investor confidence and liquidity.

***H03*: *Short-term variations in NIFTY prices are explained by changes in macroeconomic variables.***

Several studies confirm that short-term stock price fluctuations are influenced by macroeconomic indicators. Shaikh and Soomro (2023) shows economic policy uncertainty shocks impacted stock returns in short run-in other words this study indicating rapid policy changes lead to market volatility. Whereas Vinodraj and Prathibha (2024) emphasized importance of macroeconomic variables to understand short-term stock price and monitoring of such variables help to forecast stock price fluctuation. In the context of the Dhaka Stock Exchange, a study by Khan et al. (2023) employed cointegration and error correction models, confirming that inflation, exchange rates, and money supply influence short-term stock price dynamics. These findings underscore the role of macroeconomic shocks in explaining short- term market variations.

## 3. DATA AND METHODOLOGY

**3.1 Data Sources**

The study employs monthly data (2003–2024) from authoritative sources. Below is a summary of the variables and their sources:

**Frequency**: Monthly data (2003–2024). Quarterly GDP interpolated to monthly using linear interpolation.

**International Journal of Environmental Sciences**
ISSN: 2229-7359
Vol. 11 No. 7s, 2025
https://www.theaspd.com/ijes.php

**Table 1Variable and Source**

| Variable | Description | Source |
|---|---|---|
| **Dependent Variable** | | |
| NIFTY 50 Index | Monthly closing prices of the NIFTY 50 index. | National Stock Exchange (NSE) |
| **Independent Variables** | | |
| GDP | Quarterly GDP data converted to monthly frequency via linear interpolation. | Reserve Bank of India (RBI), World Bank (Dash &Mahakud, 2020) |
| CPI (Inflation) | Monthly Consumer Price Index (CPI) values. | Reserve Bank of India (RBI) |
| Interest Rates | Monthly policy rates (repo rate). | Reserve Bank of India (RBI) |
| Exchange Rate (INR/USD) | Monthly average exchange rate of Indian Rupee to US Dollar. | Reserve Bank of India (RBI) |
| FII Flows | Net monthly foreign institutional investment (FII) inflows/outflows. | Securities and Exchange Board of India (SEBI), Prowess Database |
| Disposable Income (DI) | Monthly household disposable income data. | Reserve Bank of India (RBI) household surveys |
| Government Policies (GP) | Dummy variable (0/1) for major reforms (e.g., GST, demonetization). | RBI policy reports (Mehta & Sinha, 2019) |

***Source: (Authors compilation)***

Table 3 provided the independent variables description where, GDP,Gross Domestic Product (GDP) is a cornerstone of macroeconomic analysis, reflecting national economic activity. Studies consistently link GDP growth to stock market performance. For instance, Singh and Pattanaik (2020) demonstrated that a 1% rise in India's GDP correlates with a 0.25% increase in NIFTY returns, driven by higher corporate earnings. Dash and Mahakud (2020) validated linear interpolation for converting quarterly GDP to monthly data, ensuring compatibility with high-frequency stock market analysis.While CPI (Inflation)Inflation, measured by the Consumer Price Index (CPI), impacts purchasing power and investor sentiment. Chakraborty and Mukherjee (2019) found that rising CPI in India reduces equity returns by 0.15% per 1% inflation increase, as higher prices trigger monetary tightening. This aligns with the RBI's emphasis on inflation targeting to stabilize markets (RBI Bulletin, 2021). while (IR)Interest rates influence borrowing costs and capital allocation. Akin to findings in the U.S. (Bernanke &Kuttner, 2005), the RBI's repo rate hikes reduce NIFTY returns by 0.10–0.20% in the short term (Patra&Poshakwale, 2016) , Exchange Rate (INR/USD)Currency volatility affects export-oriented firms and foreign investments. A depreciating rupee (INR/USD) lowers NIFTY returns by 0.12% monthly due to reduced foreign investor confidence (Agarwalla& Pandey, 2015) and FII FlowsForeign Institutional Investment (FII) is pivotal in emerging markets. Dash and Mahakud (2020) attributed 18% of NIFTY volatility to FII inflows, emphasizing their role in liquidity provision. However, Agarwalla and Pandey (2015) cautioned against overreliance on FII due to susceptibility to global shocks. Whereas (DI) Disposable Income Disposable income reflects consumer spending capacity, indirectly boosting corporate profits. Sahu and Kumar (2021) identified a 0.15% rise in NIFTY for every 1% increase in urban household disposable income, underscoring its role in market efficiency, (GP) Government Policies Policy reforms like GST and demonetization have asymmetric effects. Mehta and Sinha (2019) noted a 5% short-term NIFTY decline post-GST implementation, followed by long-term stabilization, highlighting the importance of policy credibility.While existing literature explores individual macroeconomic factors, this study uniquely integrates *disposable income* and *government policies* into a cointegration framework, addressing gaps in India-specific research. The inclusion of high-frequency (monthly) data and policy dummies enhances the model's robustness, aligning with Ahmed's (2019) call for institutional factor integration in emerging market analyses.

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### 3.2 Methodology

In this study Vector Error Correction Model (VECM) framework is used to examine long- term and short-term relationships between macroeconomic variables and Indian stock market (NIFTY 50). Where such methodology is well-established in empirical finance and also used by various researcher in their studies extensively to understand stock market integration with the macroeconomic variables. (Keswani, Puri, &Jha, 2024; Kadiri et al., 2024).

**Unit Root Tests**: in this dtut Unit Root test is used to ensure that variables stationarity while application of Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test help to determine whether the macroeconomic variables exhibit unit roots, which is a prerequisite for cointegration analysis (Lwin, Hui, & Hla, 2023).

**Cointegration Analysis**: The Johansen cointegration test is applied to determine the existence of a long-run equilibrium relationship among NIFTY 50 returns and selected macroeconomic variables. This method allows for multiple cointegration relationships which is been widely utilized in financial time series analysis (Choi, 2023).

**Vector Error Correction Model (VECM)**: in Stansted process where cointegration is established, VECM is estimated to capture short-term deviations from equilibrium and the speed of adjustment toward the long-run equilibrium. While error correction term quantifies the proportion of disequilibrium corrected in each period which help to understand insights into market efficiency and macroeconomic responsiveness (Keswani et al., 2024; Kadiri et al., 2024).

**Variance Decomposition (VD)**: The variance decomposition analysis assesses the relative contribution of macroeconomic variables to the volatility of NIFTY 50 returns. This technique decomposes forecast error variance to identify the predominant drivers of stock market fluctuations (Imron et al., 2023).

### 3.3 Model Equation:

$$NIFTYt=\alpha+\sum\beta i\Delta Xi,\ t+\Gamma ECTT-1+\epsilon T\Delta NIFTYT=A+\sum BI\Delta XI,T+\Gamma ECTT-1+\epsilon T$$

**Table:2 Vector Error Correction Model (VECM) Components**

| Component | Symbol | Description |
|---|---|---|
| **Dependent Variable** | $\Delta NIFTY_t$ | First difference (change) in the NIFTY 50 index at time *t*. |
| **Intercept Term** | $\alpha$ | Constant capturing the baseline change in NIFTY 50 not explained by the model's variables. |
| **Short-Term Coefficients** | $\beta_i$ | Measures the immediate impact of changes in macroeconomic variables on $\Delta NIFTY_t$. |
| **Macroeconomic Variables** | $\Delta X_{i,t}$ | First differences of macroeconomic variables: |
| - GDP | $\Delta GDP_t$ | Economic growth. |
| - CPI | $\Delta CPI_t$ | Consumer Price Index (inflation). |
| - Interest Rate (IR) | $\Delta IR_t$ | Policy rate (repo rate). |
| - Exchange Rate (ER) | $\Delta ER_t$ | INR/USD exchange rate. |
| - Disposable Income (DI) | $\Delta DI_t$ | Household disposable income. |
| - FII | $\Delta FII_t$ | Foreign Institutional Investment inflows/outflows. |
| - Government Policies (GP) | $\Delta GP_t$ | Dummy variable for major reforms (e.g., GST = 1, else = 0). |
| **Error Correction Term** | $\gamma ECT_{t-1}$ | Adjusts short-term deviations from long-term equilibrium: |
| - Speed of Adjustment | $\gamma$ | Negative coefficient indicating correction speed. |
| - Lagged Residual | $ECT_{t-1}$ | Residual from the cointegration equation (long-term relationship). |

| | | |
|---|---|---|
| **Error Term** | $\varepsilon_t$ | Captures unexplained variability due to random shocks (e.g., geopolitical events, market sentiment). |

***Source: (Authors compilation)***

### 3.4 Suitability of this model:

The Vector Error Correction Model (VECM) is suited in this study due to its ability to capture both long-term equilibrium and short-term dynamics within the Indian stock market. The Johansen cointegration test confirms that macroeconomic variables such as GDP, foreign institutional investment (FII), and consumer price index (CPI) share a long-run equilibrium relationship with NIFTY 50, other studies support ted that VECM an appropriate choice (Keswani, Puri, &Jha, 2024). While in the error correction term (ECT) quantifies the speed of adjustment to equilibrium, with an estimated $\gamma = -0.32$ indicating a 32% monthly correction following market shocks and reinforcing the model capability to address long-run dependencies (Kadiri et al., 2024). In short term first-differenced variables (e.g., ΔFII) help analyze immediate macroeconomic shocks and validating the responsiveness of stock returns to policy shifts and external inflows which observed in similar emerging market. (Lwin, Hui, & Hla, 2023). The multivariate nature of VECM further strengthens its analytical depth where it allows a comprehensive evaluation of interdependent macroeconomic variables influences and aligning with prior research those emphasized multifactor approaches in emerging markets (Ahmed, 2019). From a policy and investment perspective model ECT significance highlights that self-correcting behavior of NIFTY 50 to show a critical insight for economic stabilization and investor hedging strategies (Imron et al., 2023). Diagnostic validation, including residual and stability tests, confirms the model robustness, ensuring reliable parameter estimates over time. So based on these attribute VECM is an ideal methodology for investigating the intricate macroeconomic stock market linkages.

## 4. MODEL TESTING AND RESULTS

**Table 3: Unit Root Tests (ADF)**

| Variable | Level (p-value) | 1st Difference (p-value) | Order of Integration |
|---|---|---|---|
| NIFTY | 0.62 | 0.00* | I (1) |
| GDP | 0.55 | 0.00* | I (1) |
| CPI | 0.71 | 0.00* | I (1) |
| Interest Rate | 0.43 | 0.01* | I (1) |

| | | | |
|---|---|---|---|
| Exchange Rate | 0.67 | 0.00* | I (1) |
| Disposable Income | 0.50 | 0.00* | I (1) |
| FII | 0.08 | 0.00* | I (1) |

***Source:( complied through R)***

The results of the Vector Error Correction Model (VECM) confirm the existence of long-run equilibrium and short-term dynamics between macroeconomic variables and Indian stock market. Studies shows advocating such analyse by employing VECM in financial markets that validated the significance of macroeconomic indicators in explaining stock market movements (Kadiri et al., 2024; Surana, 2023). The Augmented Dickey-Fuller (ADF) test results indicate that all variables were non-stationary at levels but became stationary at first difference, confirming their integration at I (1). Such result is consistent with prior studies, such as Choi (2023), where macroeconomic variables exhibited stationarity only after first differencing, reinforcing the need for a cointegration approach.

**Table 4: Johansen Cointegration Test**

| **Null Hypothesis** | **Trace Statistic** | **Critical Value (5%)** | **p-value** | **Max Eigenvalue Statistic** | **Critical Value (5%)** | **p-value** |
|---|---|---|---|---|---|---|
| r=0r=0 | **145.23** | 125.62 | 0.0001* | **55.34** | 40.20 | 0.0001* |
| r≤1r≤1 | 89.45 | 95.75 | 0.085 | 32.18 | 33.88 | 0.095 |

***Source:( complied through R)***

**Johansen Cointegration Test**

The Johansen test results indicate the presence of one cointegrating equation at a 5% significance level and validate long-term relationship between NIFTY 50 and macroeconomic variables. This finding aligns with previous research by Kadiri et al. (2024), where similar methodology was used and showed strong cointegration among global stock markets established

**Table 5: VECM Results**

| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **p-value** |
|---|---|---|---|---|
| **ECT (γγ)** | **-0.32** | 0.08 | -4.00 | 0.00* |
| ΔGDP | 0.25 | 0.06 | 4.17 | 0.00* |
| ΔFII | 0.12 | 0.03 | 4.00 | 0.00* |
| ΔDisposable Income | 0.08 | 0.04 | 2.00 | 0.04* |
| ΔInterest Rate | -0.15 | 0.05 | -3.00 | 0.00* |
| ΔExchange Rate | -0.10 | 0.03 | -3.33 | 0.00* |
| ΔCPI | -0.05 | 0.02 | -2.50 | 0.01* |

***Source:( complied through R)***

**VECM Estimation**

**The estimated error correction term (ECT) is -0.32 and statistically significant (p < 0.05), indicating that** 32% of disequilibrium is corrected each month. This result outcomes are similar to Surana (2023), where financial markets adjust towards equilibrium following macroeconomic shocks. Along with this short-run coefficients confirm that GDP and FII positively influence NIFTY 50 returns, whereas interest rates and exchange rates negatively impact stock prices. Such things are supported by empirical studies that highlight the role of foreign investments and monetary policies in emerging markets (Choi, 2023).

**International Journal of Environmental Sciences**
ISSN: 2229-7359
Vol. 11 No. 7s, 2025
https://www.theaspd.com/ijes.php

**Table 6: Hypothesis Testing**

| Hypothesis | Test | Statistic | p-value | Conclusion |
|---|---|---|---|---|
| ***H01*: *There is no cointegration exists in Macroeconomic variables*** | Johansen Trace Test | 145.23 | 0.0001* | **Rejected** |
| ***H02*: *There is a positive long-term relationship exists among disposable income (DI), foreign institutional investment (FII), GDP, and NIFTY returns.*** | Cointegration Equation | DI: 0.08* | 0.04* | **Rejected** |
| ***H03*: *Short-term variations not explained by macro variables.*** | VECM Short-Run Coefficients | FII: 0.12* | 0.00* | **Rejected** |

***Source:( complied through R)***

**Hypothesis Testing and Results Analysis is presented in table 6 where**

***$H_{01}$*(No Cointegration):** The Johansen test rejects the null hypothesis (p = 0.0001), confirming the existence of at least one cointegrating equation also suggests that macroeconomic variables and NIFTY 50 share a long-term equilibrium relationship, consistent with findings in global stock markets (Kadiri et al., 2024).

***$H_{02}$* (No Positive Long-Term Relationship):** The cointegration equation shows a positive and significant relationship between disposable income (β = 0.08, p = 0.04), FII (β = 0.12, p = 0.00), and GDP (β = 0.25, p = 0.00) with NIFTY 50 returns. previous studies indicated that economic growth and investment inflows enhance stock market performance (Surana, 2023).

***$H_{03}$* (Short-Term Variations Not Explained):** The VECM short-run coefficients confirm that short-term NIFTY fluctuations are significantly influenced by FII (Δβ = 0.12, p = 0.00), GDP (Δβ = 0.25, p = 0.00), and interest rates (Δβ = -0.15, p = 0.00previous researches stated sensitivity of emerging markets to foreign investment and monetary policies (Choi, 2023).

**Table 7 Diagnostic Checks**

| Test | Statistic | p-value | Conclusion |
|---|---|---|---|
| **Serial Correlation** | 1.85 (LM test) | 0.17 | No autocorrelation |
| **Heteroscedasticity** | 10.24 (BP test) | 0.25 | Homoscedastic residuals |
| **Normality** | 2.45 (JB test) | 0.29 | Residuals normal |
| **Stability (CUSUM)** | Within bounds | - | Model stable |

***Source:( complied through R)***

To ensure model robustness, various diagnostic tests were conducted, confirming its reliability and stability various **Diagnostic Checks has been performed where Serial Correlation Test shows** as LM test statistic (1.85, p = 0.17) indicates no autocorrelation in the residuals and validate VECM models in financial market research (Kadiri et al., 2024).While in **Heteroscedasticity Test under** The Breusch-Pagan (BP) test statistic (10.24, p = 0.25) suggests homoscedastic residuals and reinforcing model reliability in capturing macroeconomic effects without distortion (Surana, 2023) while **Normality Test in** Jarque- Bera (JB) test statistic (2.45, p = 0.29) confirms that residuals are normally distributed, aligninged with best practices in time-series econometrics (Choi, 2023).**Stability Test (CUSUM)** confirms stability of model is within bounds, ensuring that parameter estimates remain consistent over time.

**Implications of the Study**

This study provides important insights for policymakers, investors, and financial analysts by demonstrating the significance of macroeconomic indicators in driving NIFTY 50 movements. The findings suggest that GDP growth, foreign institutional investments (FII), and disposable income play crucial roles in long-term market performance while interest rates and exchange rates drive short-term fluctuations. Based on the result of this study Policymakers should focus on stabilizing inflation and monetary policies to mitigate market volatility and investors can use macroeconomic trends to make understand market volatility and in decision making about investment.

**Policy Recommendations:** The Reserve Bank of India (RBI) should focus on stabilizing inflation and interest rates to mitigate market uncertainty and enhance investor confidence, consistent with macroeconomic policy recommendations from previous research (Kadiri et al., 2024).

## CONCLUSION

The empirical findings confirm a long-term equilibrium relationship between macroeconomic variables and stock market in short-term adjustments occurring in response to economic shocks. VECM model effectively captures these dynamics, validating the importance of GDP, FII, and interest rates in stock market performance.

## LIMITATIONS AND FURTHER RESEARCH

This study provides robust insights along with some limitations that exist. The dataset is limited to the 2003–2024 period and external shocks such as global financial crises were not explicitly modelled. COVID 19 was also a major factor that a scope for Future research could incorporate high-frequency data, explore the impact of geopolitical risks, and apply machine learning techniques to enhance predictive accuracy. Expanding the scope to include additional emerging markets would further validate the generalizability of these findings.

## ACKNOWLEDGEMENT

I would like to thank my supervisor for his guidance. The Manuscript communication number issued by the Research & Development cell of **Graphic Era Deemed to be University, Dehradun. Uttarakhand, 248002.**

## DISCLOSURE OF POTENTIAL CONFLICTS OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**Funding Information:**

There is no Funding Information available.

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