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Economic Growth and Equity Performance in India: Evidence from GDP and Nifty 50 Dynamics

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ABSTRACT
This study empirically investigates the relationship between India's GDP growth and stock market performance, focusing on the Nifty 50 index over the period 2008–2024. During these years marked by major economic transitions—including post-crisis recovery, key structural reforms, and the COVID-19 shock—real GDP growth exhibited relative stability, while stock market returns displayed significantly higher volatility. Descriptive analysis reveals that GDP growth averaged 6.11% compared to 2.66% for Nifty returns, with coefficients of variation of 0.77 and 3.36 respectively, underscoring the contrasting nature of these indicators. A Pearson correlation coefficient of indicates a weak linear relationship between GDP growth and equity returns. To further explore the connection, a multiple regression model incorporating inflation, the RBI repo rate, and the USD–INR exchange rate was estimated. The low adjusted R-squared value and absence of statistically significant predictors suggest that neither GDP nor the selected macroeconomic variables reliably explain short-term stock market movements. These findings imply that Indian equity markets are influenced more by forward-looking expectations, global cues, and policy signals than by contemporaneous GDP figures. The study concludes that while stock markets and GDP share broad long-term trends, their short-term interactions are weak and complex.
Keywords: GDP growth; Stock market returns; Macroeconomic indicators; Correlation analysis; Regression analysis; Emerging markets

1. INTRODUCTION:

The relationship between economic growth and stock market performance has long been a subject of interest in financial economics, particularly in emerging economies where markets are rapidly evolving. In India, real GDP growth is widely regarded as a key indicator of economic productivity and developmental progress, while stock market returns—especially those of benchmark indices such as the Nifty 50—reflect investor sentiment, risk perception, and expectations regarding future economic prospects. Understanding the interaction between these two indicators is essential for investors, policymakers, and researchers seeking to interpret market dynamics within the broader macroeconomic environment.

Between 2008 and 2024, the Indian economy experienced significant structural transformations and unprecedented shocks, including the aftermath of the global financial crisis, the policy stagnation of the early 2010s, landmark reforms such as the Goods and Services Tax (GST) and demonetization, and the severe economic disruption caused by the COVID-19 pandemic followed by a rapid recovery. During this period, India's real GDP growth averaged 6.11%, reflecting relative macroeconomic stability, whereas Nifty 50 returns averaged only 2.66%, exhibiting substantially higher volatility. This contrast is further emphasized by the coefficients of variation—0.77 for GDP and 3.36 for Nifty 50 returns—indicating that stock markets respond more sensitively to short-term shocks and global cues than to the steady progression of economic growth.

Existing literature suggests that while GDP embodies long-term economic fundamentals, stock markets are inherently forward-looking, pricing in future expectations rather than current output levels. This divergence is particularly relevant in India, where formal financial markets predominantly represent corporate and organized sectors, while a significant portion of national output originates from informal or less market-linked sectors. As a result, GDP movements may not be immediately or proportionally reflected in equity market performance.

Against this backdrop, this study investigates the empirical relationship between India's real GDP growth and Nifty 50 stock market returns from 2008 to 2024. In addition to GDP, key macroeconomic variables—such as inflation, the Reserve Bank of India's (RBI) repo rate, and the INR/USD exchange rate—are incorporated to assess their combined influence on market behaviour. Through correlation analysis and multiple linear regression, the study aims to evaluate whether meaningful, statistically

significant linkages exist between macroeconomic indicators and stock market performance in India's evolving financial landscape.

By addressing both contemporaneous relationships and broader structural patterns, this research contributes to a deeper understanding of how expectations, sentiment, policy developments, and global factors shape equity market movements in one of the world's fastest-growing emerging economies.

LITERATURE REVIEW

The UTI Mutual Fund article *"GDP and Its Relationship with Broader Markets"* explains how a country's Gross Domestic Product (GDP) growth and stock market performance are interconnected. While GDP measures the overall economic output, stock markets reflect investor sentiment and expectations about future growth. Historically, rising GDP indicates expanding corporate profits, fostering bullish markets. Mingwei and Yingchao (2018) analyse the relationship between China's GDP growth and stock market performance using econometric methods such as cointegration tests and variance decomposition. Their findings indicate a long-term equilibrium relationship between seasonally adjusted GDP growth and stock market metrics. Notably, Granger causality tests reveal that changes in GDP significantly influence stock market turnover, with GDP variance impacting turnover more than vice versa. This suggests that GDP growth plays a guiding role in the development and promotion of China's stock futures market. Bhattarai et al. (2021) investigate the relationship between stock market development and economic growth in Nepal from 1994 to 2019 using an autoregressive distributed lag (ARDL) model with bound testing procedures. The findings reveal a significant long-term equilibrium relationship between stock market development and economic growth, suggesting that enhancing the stock market could positively influence Nepal's economic growth.

Paramati and Gupta (2011) investigate the causal relationship between stock market performance and economic growth in India from April 1996 to March 2009. Using monthly Index of Industrial Production (IIP) and quarterly Gross Domestic Product (GDP) data, the authors employ unit root tests, Granger causality tests, Engle-Granger cointegration tests, and error correction models. Findings show a bidirectional relationship between IIP and stock prices (BSE and NSE). However, quarterly results show no relationship between GDP and BSE, but a unidirectional relationship from GDP to NSE. The study concludes that economic growth plays a significant role in stock market development, supporting the 'demand following' hypothesis in the short run.Keswani et al. (2024) explore the long-term relationship between key macroeconomic factors and stock prices in the Indian stock market from 2009 to 2019. Using monthly data, they apply cointegration analysis and the Vector Error Correction Model (VECM) Granger causality test. The study finds a significant long-term association between stock prices and variables like GDP, disposable income, and Foreign Institutional Investor (FII) flows. Additionally, stock returns show a negative relationship with interest rates, government policies, exchange rates, and inflation. These insights help investors, policymakers, and economists understand how macroeconomic factors influence India's stock market dynamics.

Srinivasan (2014) investigates the relationship between stock market development and economic growth in India using annual data from 1991 to 2012. The study employs cointegration and Granger causality tests to examine long-term and short-term dynamics between stock market indicators — such as market capitalization and turnover ratio — and GDP growth. The findings reveal a strong long-term relationship and bidirectional causality between stock market development and economic growth. The research by MSCI (2010) examines the connection between GDP growth and equity returns. It challenges supply-side models, which suggest that GDP growth directly translates into stock market performance through corporate profit growth, earnings per share (EPS) growth, and stock price increases. Filatov and Gurbanov (2024) examine the connection between U.S. GDP growth and the performance of the stock market, specifically focusing on the S&P 500 index. The authors analyse data from 1990 to 2019 and use linear regression techniques to model this relationship. The results reveal a strong positive correlation between GDP growth and stock market performance and indicate statistical significance. The findings emphasize the reliability of GDP as a basis for forecasting the stock market and have significant implications for investors, particularly those involved in index funds. The study concludes that understanding the GDP-stock market connection is crucial for making informed investment decisions and economic predictions.The study by Jabeen et al. (2022) Investigates the Impact of macroeconomic factors on stock returns, particularly under conditions of economic uncertainty. The authors use machine learning techniques to analyse the influence of news sentiment on stock performance, focusing on the interplay between macroeconomic variables and market reactions to economic news. The research demonstrates that macroeconomic factors, such as GDP growth and inflation, alongside economic uncertainty and news sentiment, significantly affect stock returns. The findings emphasize the importance of considering news sentiment and machine learning models for better forecasting and understanding stock market behaviour during uncertain economic conditions. Ball and French (2021) explore the theoretical and practical relationship between stock markets and GDP. The study examines how stock market performance can be interpreted as a predictor of economic growth, highlighting both the strengths and limitations of this relationships and provided a nuanced understanding of the predictive power of stock markets in relation to GDP.

Ahn & Cogman (2007) examine China's capital market transformation, driven by regulatory reforms, increased foreign participation, and improved corporate governance. The authors highlight how China's financial system, traditionally bank-centric, is evolving towards a more market-based approach. The paper argues that these changes, though slow and often overlooked, are creating a more robust financial system that can support sustainable economic growth while integrating China into the global capital markets. Atje & Jovanovic (1993) explore the relationship between stock market

development and economic growth, using cross-country empirical analysis. Their findings suggest that countries with more active stock markets experience higher economic growth, even after controlling for other financial factors.

Greenwood & Smith (1997) investigate the reciprocal relationship between financial market development and economic growth. The authors argue that financial markets enhance economic efficiency by reducing transaction costs, improving capital allocation, and fostering investment in high-growth industries. They explore how financial institutions evolve over time, adapting to the needs of a growing economy. Using historical and theoretical analysis, they demonstrate that economies with well-developed financial markets experience faster and more stable growth. The paper highlights policy implications, advocating for deregulation, investor protection, and financial deepening to maximize economic benefits.Harris (1997) reassesses the link between stock markets and economic development, challenging earlier studies that found a strong positive correlation. Using updated econometric techniques and a broader dataset, the paper questions whether stock market growth directly translates into higher GDP. The study calls for a more nuanced view, considering factors like legal infrastructure, investor behaviour, and macroeconomic stability when evaluating the impact of stock market expansion on economic growth.

Abu-Bader & Abu-Qarn (2005) examined the relationship between financial development and economic growth in Egypt using time-series data. The findings suggest a strong, long-term relationship where financial development positively impacts economic growth. However, the study also acknowledges challenges such as institutional weaknesses that may hinder financial sector contributions to growth. The results support policies that strengthen financial markets, enhance financial deepening, and improve regulatory frameworks to sustain economic development.Adajaski & Biekpe (2006) investigated the link between stock market development and economic growth in selected African countries. Using panel data analysis, they found that well-functioning stock markets contribute to economic growth by providing liquidity, facilitating investment, and promoting financial efficiency. The authors recommend policy measures that strengthen financial institutions, promote investor confidence, and improve stock market regulations to maximize the benefits of financial development on economic growth.

Agarwal (2001) explored stock market development and its impact on economic growth in African countries. Using empirical evidence, the study found that financial markets play a crucial role in economic expansion by improving capital access and investment efficiency. However, underdeveloped stock markets in many African nations limit their effectiveness in supporting growth. The research highlights the importance of regulatory reforms, enhanced investor participation, and financial market integration to strengthen economic performance. The study concludes that a robust stock market can significantly contribute to long-term economic development if supported by sound policies and institutional frameworks.

Agrawalla & Tuteja (2007) analysed the causality between stock market development and economic growth in India using Granger causality tests. Their findings indicate a bidirectional relationship, suggesting that stock market growth fuels economic expansion, and vice versa. Alam & Hasan (2003) examined the causal relationship between stock market development and economic growth in the United States. Using time-series econometric techniques, the study finds that stock market expansion significantly contributes to economic growth by improving liquidity, reducing transaction costs, and enhancing investment opportunities.The authors suggest policy measures that promote market efficiency and transparency to maximize stock market contributions to economic expansion.

Arestis et al. (2001) studied the role of stock markets in financial development and economic growth. Their research found that while stock markets facilitate investment and risk diversification, banking sector development has a more substantial and direct impact on economic growth and recommended a balanced financial policy approach that strengthens both banking and stock markets. Bhattacharya & Sivasubramanian (2003) examined the impact of financial development on India's economic growth from 1970 to 1999. Using econometric techniques, they found a strong positive relationship between financial sector expansion and economic performance. The study emphasizes the role of banking institutions in providing credit, facilitating investment, and supporting economic activity. Their findings underscore the importance of a robust financial sector in economic development. Brasoveanu et al. (2008) analysed the correlation between capital market development and economic growth in Romania. Using econometric models, they found that stock market expansion positively influences economic growth by improving investment efficiency and capital allocation. sustainable economic progress. They recommend policies that encourage financial sector development and strengthen stock market institutions to enhance Romania's economic growth trajectory.

Caporale et al. (2004) examined the causal linkages between stock market development and economic growth using a vector autoregression (VAR) model. However, the effectiveness of stock markets depends on macroeconomic conditions and financial regulations. The study concludes that policymakers should focus on financial sector reforms that promote transparency, investor confidence, and regulatory efficiency to strengthen the relationship between financial development and economic growth.Chakraborty (2008) investigated whether financial development causes economic growth in India using time-series analysis. The study finds a strong positive relationship between financial sector expansion and economic performance.Deb & Mukherjee (2008) analysed whether stock market development causes economic growth in India using time-series data. Their findings suggest that stock market expansion positively impacts economic growth through improved capital allocation, investment efficiency, and financial stability. Their research supports the view that a well-functioning stock market is essential

for long-term economic growth in emerging economies like India.Demetriades & Hussein (1996) explored the relationship between financial development and economic growth across 16 countries. Using time-series econometric analysis, they found that financial sector expansion significantly influences economic performance, though the causality direction varies across nations. The study emphasizes the role of financial institutions in mobilizing savings, facilitating investment, and supporting economic growth.Their findings underscore the importance of tailored financial policies for different economies.

The existing literature reveals significant insights into the relationship between GDP growth, stock market performance, and economic development across various countries. While several studies highlight the bidirectional or unidirectional causality between stock market development and economic growth, there is a noticeable gap in understanding how short-term market fluctuations, driven by external factors such as geopolitical events or investor sentiment, interact with long-term GDP trends. Furthermore, while research often emphasizes macroeconomic variables such as GDP and inflation, fewer studies focus on the role of sector-specific economic growth or the impact of emerging markets on stock market dynamics. The influence of technological advancements, foreign investments, and regulatory changes on the relationship between GDP and stock market performance remains underexplored. Additionally, most studies rely on econometric techniques and historical data, with limited application of modern tools like machine learning or real-time economic sentiment analysis, which could provide more nuanced and dynamic insights. A further gap exists in examining the role of financial institutions in shaping the relationship between GDP growth and stock market performance, particularly in less developed or transitioning economies. Addressing these gaps could offer a more comprehensive understanding of how stock markets and GDP growth interact in the context of rapidly evolving global markets

RESEARCH METHODOLOGY

OBJECTIVES

1. To examine the historical relationship between GDP growth and stock market returns in India
2. To assess the strength and direction of correlation between India's GDP growth rate and major stock indices over different economic periods.
3. To analyse the impact of macroeconomic events on the linkage between GDP growth and stock market performance using historical data.
4. To evaluate the stock market's responsiveness to GDP growth across different economic cycles and find any patterns or anomalies.
5. To derive insights and policy recommendations for investors, policymakers, and market participants based on historical trends, helping them make informed decisions regarding market expectations and economic indicators.

Methodology

To ensure a comprehensive analysis of the relationship between GDP growth and stock market returns, this study will utilize at least **15 years of historical data (FY 2008-2009 to FY 2023-2024)**. This timeframe captures multiple economic cycles, including periods of **high growth, recessions, financial crises, and market recoveries**. The data Collected from official sources such as the Reserve Bank of India (RBI), the Ministry of Statistics and Programme Implementation (MOSPI), and the World Bank.

- **Stock Market Returns:** Historical index returns of **NSE Nifty 50**, sourced from the National Stock Exchange (NSE), Securities and Exchange Board of India (SEBI), and Bloomberg.
- **Macroeconomic Variables:** Improve the robustness of the analysis, additional factors like **inflation rates, interest rates (RBI repo rates), and exchange rates** will be considered.

The study will employ a combination of statistical techniques to explore the relationship between GDP growth and stock market returns.A preliminary analysis will be conducted to summarize the key characteristics of the dataset, including: **Mean, median, and standard deviation** of GDP growth rates and Nifty 50 return,**Volatility measures**, such as variance and coefficient of variation, to assess market fluctuations and **Trends and patterns** in GDP growth and stock returns over different economic phases.

The Pearson Correlation Coefficient will be used to determine the strength and direction of the relationship between GDP growth and stock market returns. This analysis will help answer questions such as:

- Does higher GDP growth lead to increased stock market returns?
- Are there time lags between economic growth and market performance?
- Do stock market movements act as a leading indicator of GDP trends?

To further explore the causality between GDP growth and stock market returns, a linear regression model will be employed. The model will estimate the impact of GDP growth on Nifty 50 returns while controlling for other macroeconomic variables such as:

- **Inflation Rate (CPI or WPI):** To examine how inflation affects market performance.
- **Interest Rate (RBI Repo Rate):** To determine whether monetary policy influences stock returns.
- **Foreign Exchange Rate (INR/USD):** To assess the impact of global capital flows.

The regression model will be tested for statistical significance, multicollinearity to ensure the reliability of results.

Limitations

Using quarterly data from 2008 to 2024 results in **64 observations**. While sufficient for basic correlation testing, this is a **relatively small sample** in econometric terms—especially when considering the inherent volatility and structural breaks in both GDP and stock market data over that time (e.g., Global Financial Crisis, Demonetization, COVID-19, Russia-Ukraine war impacts, etc.).

DATA ANALYSIS

The following data has been analysed using MS Excel-

Period	Nifty 50 Value	Returns for Quarter (%)	Real GDP Growth Rate (%)
2008 Q1	4692.18	-6.75	7.9
2008 Q2	4204.72	-10.39	7.8
2008 Q3	2866.62	-31.82	5.8
2008 Q4	2886.47	0.69	5.8
2009 Q1	4071.33	41.05	6.1
2009 Q2	4794.17	17.75	7.9
2009 Q3	4981.82	3.91	6
2009 Q4	5017.82	0.72	7.8
2010 Q1	5225.60	4.14	8.5
2010 Q2	5599.98	7.16	8.2
2010 Q3	6004.97	7.23	8.5
2010 Q4	5557.63	-7.45	7.8
2011 Q1	5652.35	1.70	5.4
2011 Q2	5142.08	-9.03	5.3
2011 Q3	4927.65	-4.17	6.1
2011 Q4	5293.33	7.42	5.3
2012 Q1	5150.43	-2.70	5.4
2012 Q2	5396.93	4.79	5.2
2012 Q3	5801.55	7.50	4.7
2012 Q4	5803.45	0.03	4.8
2013 Q1	5919.45	2.00	4.7
2013 Q2	5649.70	-4.56	5.2
2013 Q3	6259.75	10.80	4.6
2013 Q4	6356.88	1.55	4.6
2014 Q1	7179.23	12.94	7.1
2014 Q2	7880.15	9.76	6.9
2014 Q3	8397.72	6.57	7.6
2014 Q4	8733.92	4.00	7.3
2015 Q1	8327.88	-4.65	7.5
2015 Q2	8151.02	-2.12	7.6
2015 Q3	7982.47	-2.07	7.2
2015 Q4	7429.67	-6.93	7.9
2016 Q1	8099.22	9.01	7.3
2016 Q2	8678.62	7.15	7.1
2016 Q3	8345.33	-3.84	7
2016 Q4	8871.55	6.31	6.1
2017 Q1	9482.07	6.88	5.6
2017 Q2	9927.87	4.70	6.3
2017 Q3	10364.18	4.39	7

2017 Q4	10544.75	1.74	7.7
2018 Q1	10729.93	1.76	7.5
2018 Q2	11322.48	5.52	6.5
2018 Q3	10708.63	-5.42	6.2
2018 Q4	11082.45	3.49	5.7
2019 Q1	11819.93	6.65	5.1
2019 Q2	11205.23	-5.20	4.3
2019 Q3	12033.98	7.40	3.3
2019 Q4	10587.20	-12.02	2.9
2020 Q1	9914.10	-6.36	-23.1
2020 Q2	11236.17	13.34	-5.8
2020 Q3	12864.37	14.49	1.8
2020 Q4	14284.82	11.04	3.3
2021 Q1	15311.80	7.19	22.6
2021 Q2	16837.80	9.97	9.9
2021 Q3	17336.30	2.96	5.5
2021 Q4	17199.50	-0.79	4.5
2022 Q1	16489.12	-4.13	13.5
2022 Q2	17337.30	5.14	6
2022 Q3	18291.95	5.51	4.8
2022 Q4	17441.95	-4.65	6.9
2023 Q1	18596.15	6.62	9.7
2023 Q2	19548.63	5.12	9.3
2023 Q3	20314.72	3.92	9.5
2023 Q4	22011.80	8.35	8.4
2024 Q1	23,048.72	4.71	6.5
2024 Q2	25,332.63	9.91	5.6
2024 Q3	23,993.75	-5.29	6.2
2024 Q4	23,050.82	-3.93	6.5

Table 1.1 – Data consisting of Quarterly GDP Growth Rates & NIFTY 50 Returns from FY 2008-09 to FY 2024-25 Sources: Investing.com & MoSPI Website

Mean of Nifty 50 Returns	2.66
Median of Nifty 50 Returns	3.96
Standard Deviation of Nifty 50 Returns	8.92
Coefficient of Variation of Nifty 50 Returns	3.36
Variance of Nifty 50 Returns	79.63

Table 1.2- Result of Calculations using MS Excel on Nifty 50 data in Table 1.1

Mean of Real GDP Growth Rate	6.11
Median of Real GDP Growth Rate	6.11
Standard Deviation of Real GDP Growth Rate	4.69
Coefficient of Variation of Real GDP Growth Rate	0.77
Variance of Real GDP Growth Rate	22.04

Table 1.3- Result of Calculations using MS Excel on GDP data in Table 1.1

Following are the considerations for this data-

- For the Nifty 50 Returns , figures are sourced from investing.com and for each quarter the closing figure is taken as a simple average of three-month figures
- For the GDP figures, official estimates from government data are used where the actual figures were not available.

Nifty 50 Returns

Mean (2.66%): The average return of 2.66% over the observed period indicates modest growth in the Nifty 50 index. While positive, the return reflects a period of steady but not aggressive market performance, potentially shaped by macroeconomic factors, policy changes, and global influences.

Median (3.96%): The median return being higher than the mean suggests a left-skewed distribution, indicating that while there were several quarters of strong performance, the average was pulled down by some low or negative returns. This highlights the uneven nature of

stock market movements.

Standard Deviation (8.92%): A high standard deviation underscores the significant volatility in Nifty 50 returns. This level of fluctuation points to the market's sensitivity to economic data, investor sentiment, and global uncertainties, requiring investors to be cautious and well-informed.

Coefficient of Variation (3.36):The coefficient of variation, calculated as the ratio of standard deviation to the mean, is 3.36. This indicates that returns are highly volatile in relation to their average, underscoring the risk inherent in equity investments. Such a high CV is typical of stock indices and reflects the unpredictability of short-term market behavior.

Variance (79.63):The variance figure reinforces the high degree of dispersion in returns, aligning with the standard deviation and CV. It serves as another indicator of the market's fluctuating nature and risk profile.

Real GDP Growth Rate

Mean (6.11%): An average GDP growth rate of 6.11% reflects a strong and healthy economic trajectory. This suggests that the economy has been expanding at a steady pace, offering a supportive environment for business activity and investment over the period.

Median (6.11%): The median being equal to the mean indicates a symmetrical distribution of growth rates, suggesting that extreme values have not significantly skewed the data. This symmetry points to consistent performance across quarters.

Standard Deviation (4.69%):The standard deviation of 4.69% indicates moderate variability in quarterly GDP growth. Compared to stock market returns, this lower volatility suggests that economic growth, while fluctuating, is more stable and predictable.

Coefficient of Variation (0.77):A CV of 0.77 shows that GDP growth is relatively stable in comparison to its mean. This low relative variability is expected for macroeconomic indicators, which usually exhibit smoother trends and less extreme shifts than financial markets.

Variance (22.04):The variance supports the notion of moderate volatility in GDP growth. Although the figure is lower than that of stock market returns, it is still noteworthy, as it captures the cyclical and policy-driven nature of the economy.

Nifty 50 Returns demonstrate **high volatility** with relatively **low average returns**, indicating a riskier and more unpredictable investment avenue influenced by a wide range of short-term factors, including market sentiment, geopolitical events, and policy changes.**Real GDP Growth**, on the other hand, reflects a **more stable and consistent economic environment**. Despite moderate fluctuations, GDP growth shows steady expansion over time, providing a stronger foundation for long-term investment planning and policymaking.This divergence underscores a fundamental insight: **financial markets and economic performance do not always move in tandem**. While GDP captures the broader health of the economy, stock markets are forward-looking and can overreact to both optimism and uncertainty. Therefore, investors and analysts must distinguish between the **real economy** and **market behaviour** when making decisions or drawing conclusions.

Trends and Patterns in Nifty 50 Returns (2008–2024)

The performance of the Nifty 50 Index, a benchmark for Indian stock market performance, has been shaped by several major global and domestic events from 2008 to 2024. These years have witnessed an array of challenges and opportunities, each leaving a unique mark on market returns.

2008–2010: The Aftermath of the Global Financial Crisis

The year 2008 marked one of the most turbulent times in global financial history, triggered by the collapse of Lehman Brothers, which sent shockwaves throughout global markets. The Nifty 50, reflecting investor sentiment and global market conditions, suffered a massive crash during the global financial crisis. Indian stock markets witnessed a sharp decline, with the Nifty 50 losing nearly 50% of its value from its peak in early 2008 to its trough in March 2009.However, the Indian economy demonstrated resilience as it was somewhat insulated from the worst of the financial meltdown due to its limited exposure to subprime mortgage markets. By 2009, the stock market began recovering, reflecting a surge in investor optimism and government stimulus packages aimed at stabilizing the economy. The Nifty 50's recovery from 2009 to 2010 was fuelled by global liquidity and the rebound in foreign institutional investment (FII) flows. As investor confidence returned, the index regained ground, though volatility remained high due to lingering global uncertainties.

2010–2014: The Pre-election Optimism and Policy Challenges

The period from 2010 to 2014 was characterized by a mix of optimism and economic turbulence. The Nifty 50 experienced gradual growth during this period, but it was often overshadowed by domestic challenges, particularly in the form of inflation, high fiscal deficits, and regulatory delays. A key event in this period was the controversial rollout of the Goods and Services Tax (GST) in 2014, which had a significant impact on the economy. While GST promised long-term benefits for economic efficiency, the initial implementation phase led to market jitters due to the uncertainty it created.The stock market also faced significant challenges during the global economic slowdown, particularly after 2011 when concerns over the Eurozone crisis and slowing global demand affected investor sentiment. The Indian market, led by the Nifty 50, faced subdued returns as investors became increasingly wary about the policy paralysis in the government. The years leading up to the 2014 general elections were marked by a volatile stock market, as the electorate awaited a change in leadership. The perception of economic stagnation, compounded by policy delays and corruption scandals, led to a lack of significant market movement during this time.

2014–2019: The Modi Surge and Market Optimism

The stock market entered a new phase in 2014 when Narendra Modi's BJP won a decisive victory in the Indian general elections. Modi's promise of economic reforms, infrastructure development, and ease of doing business led to a surge in investor optimism. The Nifty 50, reflecting the confidence in these reforms, gained considerable ground.One of the major reform measures was the

implementation of the Goods and Services Tax (GST) in 2017, which streamlined India's complex indirect tax system. Despite some initial teething issues, the long-term impact of GST was anticipated to be positive, and this contributed to the positive sentiment in the market. The Nifty 50 continued its upward trajectory, buoyed by strong corporate earnings, foreign investments, and an overall upbeat economic outlook. During this period, India's stock market became one of the best-performing markets globally.

2020–2022: The COVID-19 Pandemic and Market Recovery

In 2020, the COVID-19 pandemic caused a dramatic downturn in global markets, and India was no exception. The Nifty 50 saw a sharp plunge in March 2020 as investors reacted to the uncertainty created by the pandemic and the subsequent lockdowns. The index dropped sharply, with a significant contraction in GDP growth and corporate earnings. However, the Nifty 50's recovery began in late 2020, driven by strong government stimulus packages, optimism around vaccine rollouts, and the resilience of India's digital economy.The market bounced back rapidly, reaching new highs by 2021, as the Indian government implemented several measures to support businesses, including direct cash transfers and liquidity infusions. The Nifty 50's strong performance was also aided by global liquidity, with international investors seeing India as an attractive investment destination in a post-pandemic world. However, the second wave of COVID-19 in 2021 created some temporary setbacks, but the market had already priced in the risk and rebounded quickly.

2022–2024: Inflation, Geopolitical Uncertainty, and Market Resilience

As India entered 2022, the global landscape became more complex. The war in Ukraine led to an increase in commodity prices, resulting in rising inflation across the globe. This, coupled with tighter monetary policies in major economies, created challenges for stock markets. The Nifty 50 showed some volatility in response to these global developments, as inflationary pressures started to weigh on investor sentiment. However, the index showed resilience as India's economy was somewhat insulated from the global energy crisis and geopolitical tensions.By 2024, the market seemed to stabilize, with a focus on domestic consumption, India's growing digital economy, and ongoing structural reforms. The Nifty 50, while facing short-term challenges, displayed an underlying strength as the economy rebounded from the pandemic, and investors began to look beyond the immediate challenges of inflation and geopolitical risks.

Trends and Patterns in India's Real GDP Growth (2008–2024)

India's Real GDP growth has been shaped by several global and domestic factors, including financial crises, policy reforms, and global health emergencies.

2008–2010: The Global Financial Crisis and a Slowdown

India's Real GDP growth was initially strong in 2008, growing at about 6.7%. However, the financial crisis that started in 2007 and culminated in the Lehman Brothers collapse in September 2008 led to a global recession that deeply affected the Indian economy. While India was not as severely impacted as other economies due to its limited exposure to global financial markets, its GDP growth decelerated sharply in 2009 to about 6.7%. This slowdown was attributed to reduced global demand, domestic consumption drops, and a decline in exports.In 2010, India's GDP growth began recovering as the government introduced stimulus measures, and the economy rebounded strongly, with growth reaching around 8.5%. The recovery was led by a resurgence in domestic consumption, a key pillar of India's economy, and a rapid recovery in the services sector.

2010–2014: Policy Paralysis and Stagnation

During this period, India faced several economic challenges, including high inflation, fiscal deficits, and a widening trade imbalance. The growth rate gradually slowed, from around 8.5% in 2010 to about 4.5% in 2013. This period was marked by what is often referred to as "policy paralysis," where the government struggled to implement critical reforms and address structural economic issues.In 2014, as the Modi government took office, India's GDP growth rate started to pick up again, albeit slowly. The period also witnessed an increased focus on infrastructure, digital India initiatives, and ease of doing business reforms, which provided optimism for future growth.

2014–2019: Reform and Growth Surge

India's GDP growth surged during this period, with a peak of 8.3% in 2016. The major domestic reforms such as the implementation of the Goods and Services Tax (GST) in 2017, which simplified the tax structure, and the demonetization initiative in 2016, were significant turning points. While demonetization initially caused disruption, the long-term effects were expected to bring efficiency to the economy by curbing black money and digitizing transactions.During this period, India became one of the fastest-growing major economies, driven by reforms in the labour market, infrastructure projects, and improvements in the digital economy.

2020–2022: The COVID-19 Pandemic and Economic Contraction

The COVID-19 pandemic caused a sharp contraction in India's GDP in 2020. The economy shrank by about 7.3%, marking one of the deepest recessions in Indian history. The nationwide lockdown, business closures, and job losses created a severe economic shock. However, the government's fiscal response, including cash transfers, subsidies, and stimulus measures, helped the economy recover rapidly in the subsequent years.In 2021, India experienced a sharp rebound in growth, with GDP growing by 8.7%, driven by recovery in consumer demand, export growth, and industrial output. The government continued its reform agenda, focusing on infrastructure, agriculture, and digitization, which provided the foundation for the economic recovery.

2022–2024: Inflationary Pressures and Slowdown

India's GDP growth slowed in 2022 to around 5.5% due to rising inflation, global supply chain disruptions, and geopolitical instability. The impact of the Russia-Ukraine war, rising commodity prices, and tightening global monetary policies led to increased costs and slower demand.By 2024, India's economy was on a more stable path, growing at around 6%. While inflationary concerns remained, India's focus on consumption-driven growth,

technology adoption, and domestic reforms in sectors like healthcare, energy, and manufacturing helped maintain a growth trajectory despite external challenges. The resilience of the Indian economy highlighted its capacity to weather global volatility and continue growing, although at a more moderate pace.

Correlation

The Pearson Correlation Coefficient will be used to determine the strength and direction of the relationship between GDP growth and stock market returns.

	Returns for Quarter (%)	*Real GDP Growth Rate (%)*
Returns for Quarter (%)	1.00	
Real GDP Growth Rate (%)	0.0624	1.00

Table 1.4 – Correlation Analysis Output Table

The Correlation Coefficient for the two sets of values comes to **0.0624**

Statistical Implications and Limitations

The Pearson correlation coefficient of **0.0624** indicates a statistically weak relationship between Nifty 50 returns and real GDP growth. However, drawing conclusions from this value without a deeper understanding of its statistical implications and underlying limitations may lead to incorrect or incomplete interpretations. This section dives into the statistical nuance of what this low correlation signifies, how data characteristics influence the outcome, and why the relationship between equity markets and macroeconomic indicators is inherently more complex than a single metric can capture.

Low Correlation ≠ No Relationship

A key statistical misunderstanding is equating low Pearson correlation with the absence of a relationship. A Pearson coefficient strictly measures **linear** relationships. It cannot detect:

- **Non-linear** patterns (e.g., curvilinear or threshold effects),
- **Lagged** associations (e.g., stock markets reacting to future GDP expectations),
- **Asymmetric responses** (e.g., markets reacting more strongly to GDP slowdowns than booms), or
- **Conditional correlations** (e.g., correlation only existing in periods of crisis or high volatility).

In the context of Nifty 50 and GDP, it's quite plausible that market participants react **only to surprises** or **unexpected shifts** in GDP rather than the magnitude of the figure itself. Alternatively, markets may reflect a **leading indicator** role—moving ahead of GDP changes. In such cases, a weak same-period Pearson correlation like 0.0624 doesn't mean markets and the economy are disconnected—it means their relationship is not immediate, linear, or constant over time.

Example: If the stock market rallies 10% in anticipation of future reforms while GDP still grows at 4%, the contemporaneous correlation appears weak, but this doesn't invalidate a deeper linkage.

Volatility Mismatch Between Nifty 50 and GDP

GDP is a **slow-moving macro indicator**. Its quarterly changes are typically within the range of -1% to +8% and are heavily smoothed due to statistical estimation techniques and revisions. In contrast, the **Nifty 50 is highly volatile**, often fluctuating by -15% to +20% in a single quarter due to investor sentiment, earnings shocks, and external cues.

This mismatch in **variance and data behaviour** creates a statistical problem:

- The **standard deviation** of Nifty returns is much higher than that of GDP growth.
- Pearson correlation assumes homoscedasticity (i.e., constant variance), which is clearly violated.
- As a result, even meaningful economic changes in GDP may appear insignificant to market returns in a statistical sense.

Macroeconomic Lag and Policy Noise

the influence of **macroeconomic lag and policy-induced distortions**, which further complicates correlation analysis between market returns and GDP.

Lag Between Policy and Impact

Monetary and fiscal policy changes (e.g., changes in the repo rate, tax reforms, or infrastructure investments) affect the economy with **lags** ranging from one to four quarters. For instance:

- An RBI rate cut may stimulate credit demand, boost consumption, and eventually raise GDP—but only after several months.
- Similarly, the stock market may immediately respond to the **announcement** or even the **expectation** of such policy, well before GDP numbers register the impact.

This **mismatch in timing** makes same-period correlations misleading. If a policy impacts GDP after 2 quarters but affects Nifty returns immediately, a quarterly correlation exercise will not reflect the true strength of the relationship.

Noise from External and Domestic Policies

Policy announcements introduce **random shocks** or **noise** into the data:

- Budget announcements can lead to speculative movements in equity markets regardless of immediate GDP impacts.
- Changes in global trade policy (e.g., US-China tariffs) or oil prices often trigger market movements that have only tangential effects on GDP.
- Regulatory changes like the GST rollout or the introduction of corporate tax cuts create dislocations that temporarily distort economic indicators.

All of these introduce **confounding variables** that weaken the clarity of any direct GDP-market relationship. Moreover, **frequent revisions** in GDP data (due to methodology or base year updates by CSO/MoSPI) complicate long-term correlation analysis. A value once published may later be revised significantly, undermining the stability and reliability of correlation metrics calculated on preliminary data.

While a Pearson correlation of 0.0624 may statistically indicate a weak linear relationship, it should not be interpreted in isolation. Ultimately, correlation is only the starting point—not the conclusion—in understanding the relationship between economic fundamentals and financial markets.

Now, the three research questions raised in the Research Methodology shall be answered in detail with the help of correlation analysis on the data:

- **Does Higher GDP Growth Lead to Increased Stock Market Returns?**

In theory, higher GDP growth should reflect improving economic fundamentals—rising consumer spending, higher business investments, and expanding corporate profits. These factors logically suggest a favourable environment for equity markets. However, the observed **Pearson correlation coefficient of 0.0624** tells a different story in practice. This statistically weak and near-zero correlation implies that **higher GDP growth, at least in the same quarter, does not reliably translate into higher Nifty 50 returns**.

There are several reasons behind this disconnect. Firstly, equity markets are influenced by **expected future earnings** and not just present or past performance. So even if GDP is growing robustly in a quarter, investors may already have anticipated this growth and factored it into stock prices earlier. Moreover, GDP growth in India includes sectors like agriculture, public administration, and informal trade—components that **do not have strong representation on the stock exchange**, especially within the Nifty 50, which is heavily weighted towards financials, IT, and large industrial firms.

Also worth noting is that **GDP is an aggregate measure** that smoothens out sectoral volatility. Stock market returns, on the other hand, are much more reactive to firm-level news, investor psychology, and external triggers (like geopolitical risks or global commodity prices). Thus, while GDP growth might reflect long-term economic improvement, its direct effect on near-term stock performance is minimal.

In conclusion, the correlation statistic indicates that **GDP growth does not have a meaningful immediate influence on quarterly market returns**, and relying on it as a short-term market predictor can be misleading.

- **Are There Time Lags Between Economic Growth and Market Performance?**

The question of lag is particularly important when analysing macroeconomic-financial linkages. The observed correlation value of 0.0624 assumes a **simultaneous** relationship between Nifty 50 returns and GDP growth. However, this same-period analysis does **not account for temporal dynamics**, such as the market reacting to expected growth **before** it happens or GDP reflecting economic momentum **after** market sentiment shifts.

Time lags occur because economic data is typically released with a **delay** and revised over time, while markets operate in **real-time**, digesting news and expectations almost instantly. For instance, a policy reform aimed at increasing capital investment might boost investor sentiment and equity prices well ahead of when its full effect shows up in GDP figures. Conversely, if GDP contracts due to a prior quarter's shock (like a pandemic or interest rate spike), markets might have already adjusted downward, causing a mismatch in the quarterly relationship.

To detect such lags, analysts often apply **cross-correlation tests or lagged regression models** to observe how changes in GDP influence future market returns—or vice versa. In many studies globally, lagged correlations show stronger links than same-period ones. The weak contemporaneous correlation in this case suggests that **market performance and economic activity may not move in tandem in the short term** but could still be interconnected over longer horizons or with lead-lag effects.

Therefore, it's plausible that **stock market performance reflects expectations about future GDP, while GDP data lags investor actions**. This temporal misalignment may dilute short-term correlations but doesn't necessarily disprove a meaningful relationship.

- **Do Stock Market Movements Act as a Leading Indicator of GDP Trends?**

Stock markets are widely considered **forward-looking mechanisms**, pricing in expectations of future earnings, inflation, interest rates, and macroeconomic conditions. In this context, it is worth exploring whether movements in the Nifty 50 index serve as a **leading indicator of GDP trends**.

While the correlation coefficient of **0.0624** between **current** GDP growth and **same-quarter** market returns is weak, this does not automatically refute the market's predictive capacity. In fact, this low value may reflect the inappropriateness of using concurrent variables to test a **leading relationship**. To truly evaluate whether stock returns forecast GDP, one would need to examine how Nifty 50 movements in prior quarters correlate with **future GDP figures**.

International economic literature often supports the idea that **stock indices anticipate economic turning points**. For example, sustained upward trends in equity markets frequently precede recoveries in GDP, while prolonged selloffs can precede recessions. This phenomenon is based on investor behaviour—if companies are expected to grow profits in the coming quarters, their valuations rise today, long before those profits are realized and reflected in GDP.

In the Indian context, this effect may be moderated by the **unique structure of the Nifty 50**, which represents the formal, organized sector and has high exposure to global trends. If future GDP growth is driven by domestic consumption or rural expansion (which the market may not fully price), then the predictive power of the index diminishes. Moreover, **policy unpredictability and data quality issues in emerging economies** can reduce the market's ability to act as a clean forecasting tool for GDP.

Nonetheless, on a broader scale, it is reasonable to consider the stock market as a **leading indicator with limitations**. While its real-time pricing ability captures collective economic expectations, it is also prone to false signals driven by sentiment, speculation, or external shocks unrelated to real output.

Regression Analysis

On analysing the data in the table below for regression on whether other macroeconomic factors affect the correlation, the following results were obtained-

Year	Nifty 50 Returns	GDP Growth Rate	Inflation	Repo Rate (%)	USD - INR Rate
2008	-51.79 %	3.09%	8.35%	7.83	43.51
2009	75.76 %	7.86%	10.88%	5.10	48.41
2010	17.95 %	8.50%	11.99%	5.73	45.73
2011	-24.62 %	5.24%	8.91%	6.65	46.67
2012	27.70 %	5.46%	9.48%	8.00	53.44
2013	6.76%	6.39%	10.02%	7.53	56.57
2014	31.39 %	7.41%	6.67%	8.00	62.33
2015	-40.60 %	8.00%	4.91%	7.35	62.97
2016	3.01%	8.26%	4.95%	6.40	66.46
2017	28.65 %	6.80%	3.33%	6.00	67.79
2018	3.15%	6.45%	3.94%	6.27	70.09
2019	12.02 %	3.87%	3.73%	5.65	70.39
2020	14.90 %	-5.78%	6.62%	4.27	76.38
2021	24.12 %	9.69%	5.13%	4.00	74.57
2022	4.32%	6.99%	6.70%	4.98	81.35
2023	19.42 %	7.58%	5.65%	6.50	81.94
2024	8.75%	7.00%	4.60%	6.50	83.47

Table 1.5- Annual Macroeconomic Indicators i.e. Inflation, GDP, Stock Returns, Repo Rate & USD-INR Rate on an Annual Basis from 2008 to 2024
Sources: Macrotrends, BankBazaar, Basu Nivesh & Prime Investor

Multiple R	0.547713778
R Square	0.299990382
Adjusted R Square	0.066653843
Standard Error	0.280985179
Observations	17

	df	*SS*	*MS*	*F*	*Significance F*
Regression	4	0.406023711	0.101505928	1.285655403	0.329437567
Residual	12	0.94743205	0.078952671		
Total	16	1.353455761			

Table 1.6 : Regression Statistics

Table 1.7 : ANOVA Table

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.35	1.02	-0.34	0.74	-2.58	1.89	-2.58	1.89
GDP Growth Rate	2.04	2.06	0.99	0.34	-2.44	6.52	-2.44	6.52
Inflation	5.16	4.01	1.29	0.22	-3.57	13.89	-3.57	13.89
Repo Rate (%)	-0.08	0.07	-1.28	0.22	-0.23	0.06	-0.23	0.06
USD-INR Rate	0.01	0.01	0.88	0.40	-0.01	0.03	-0.01	0.03

Table 1.8 : Regression Analysis in Depth

Investigating the Causal Link Between GDP Growth and Nifty 50 Returns: A Multiple Linear Regression Approach

The interplay between macroeconomic indicators and stock market performance is a fundamental question in financial economics. This analysis aims to empirically test the causality between India's real GDP growth and the returns on the Nifty 50 index, controlling for inflation (CPI/WPI), the RBI's repo rate, and the INR/USD exchange rate. The regression model adopted here serves as a diagnostic tool to quantify and assess how macroeconomic fundamentals influence stock market behavior. It also allows for understanding whether market movements can be attributed to underlying economic conditions or driven by exogenous shocks and investor sentiment.

Model Summary and Fitness

The linear regression model yields the following key statistics:

- **Multiple R:** 0.5477
- **R-squared:** 0.2999
- **Adjusted R-squared:** 0.0667
- **Standard Error:** 0.2877
- **Observations:** 16
- **F-statistic:** 1.29 (**p = 0.33**)

The R-squared value of 29.99% indicates that nearly one-third of the variation in Nifty 50 quarterly returns is explained by the four macroeconomic variables: GDP growth, inflation, repo rate, and exchange rate. However,

the adjusted R-squared drops significantly to 6.67%, implying that including these variables may not materially enhance the model's explanatory power — potentially due to small sample size or multicollinearity.

The F-statistic of 1.29, with a p-value of 0.33, suggests that the overall regression model is not statistically significant. Therefore, we cannot reject the null hypothesis that all coefficients are jointly equal to zero, which limits the model's utility in prediction or inference.

Interpretation of Coefficients

Variable	Coefficient	t-Stat	p-value	Interpretation
Intercept	-0.38	-0.35	0.73	No meaningful baseline returns when all variables are zero
GDP Growth Rate	1.97	0.96	0.34	Positive but insignificant impact on Nifty returns
Inflation (CPI)	4.81	1.25	0.23	Positive relation, statistically weak
Repo Rate	-0.08	-1.26	0.22	Negative impact, consistent with theory but insignificant
USD/INR Exchange Rate	0.01	0.89	0.40	Minimal influence, not statistically reliable

Table 1.9 : Summary Table of Coefficients

GDP Growth Rate

The coefficient of 1.97 implies that a 1% increase in GDP growth is associated with an approximate 1.97% rise in Nifty 50 returns. However, the p-value of 0.34 suggests this result is not statistically significant. This underscores the possibility that stock markets are more forward-looking or influenced by global and sentiment-driven forces than contemporaneous GDP growth.

Inflation Rate (CPI)

The inflation coefficient of **4.81** is again notably high and positive. This could indicate that during certain inflationary environments, especially in demand-pull cycles, nominal returns were boosted, particularly for inflation-hedged sectors like FMCG and commodities. However, the lack of statistical significance **(p = 0.23)** limits the reliability of this conclusion.

Repo Rate

The negative coefficient **(−0.08)** supports economic theory — higher interest rates generally depress asset prices through higher discount rates and borrowing costs. However, the p-value (0.22) means this relationship is statistically inconclusive, likely due to anticipatory behavior by markets or confounding policy variables.

Exchange Rate (INR/USD)

A small positive coefficient (0.01) suggests a weak relationship between currency depreciation and equity returns. While rupee depreciation may benefit exporters and drive sectoral gains, the overall effect is muted and statistically insignificant **(p = 0.40).**

4. Diagnostic Consideration

Multicollinearity

Though no formal VIF values are calculated, the low t-statistics and overlapping macroeconomic influences point toward potential multicollinearity — especially between GDP, inflation, and repo rates. This can inflate standard errors and mask the true effect of each predictor.

CONCLUSION

This study examined the relationship between India's real GDP growth and Nifty 50 stock market returns between 2008 and 2024, alongside key macroeconomic indicators such as inflation, the RBI's repo rate, and the INR/USD exchange rate. The findings reveal a weak and statistically insignificant contemporaneous relationship between GDP growth and equity market performance, as reflected in the low Pearson correlation coefficient of 0.0624. This outcome underscores the forward-looking nature of financial markets, which respond more strongly to expectations, liquidity conditions, global factors, corporate earnings, and anticipated policy actions than to current GDP readings—an indicator that is lagging, periodically revised, and influenced by sectors not fully represented in equity indices.Historical episodes—including the 2008 global financial crisis, the 2014 general elections, the 2016 demonetization, and the 2020 pandemic—demonstrate that short-term stock market movements often diverge sharply from contemporaneous GDP trends. These findings challenge the conventional assumption that robust GDP growth directly translates into proportionally higher equity returns.For investors, the results highlight the limited usefulness of GDP growth as a short-term allocation tool. More reliable guidance can be found in leading indicators such as the Purchasing Managers' Index (PMI), bank credit growth, foreign institutional investor (FII) flows, earnings revisions, and corporate profitability metrics. Sentiment-driven variables—including the India VIX, social media–based sentiment trackers, news sentiment indices, and machine-learning-enabled sentiment models—also provide meaningful insights into market behaviour.

The study further underscores the importance of sector-level dynamics, as GDP aggregates conceal variations across industries, with several GDP-dominant sectors (e.g., agriculture, public administration) having limited representation in the Nifty 50. Investors may therefore benefit from sector-focused strategies, such as emphasizing consumption-driven sectors during periods of rising urban income or export-oriented industries during phases of strong global demand.From a policy perspective, the weak statistical significance of GDP, inflation, and the repo rate suggests that markets often incorporate policy expectations ahead of official announcements. Inconsistent or opaque communication can amplify volatility, emphasizing the need for clear, coordinated, and transparent guidance from the Finance Ministry and the RBI regarding fiscal consolidation, monetary stance, and reform timelines.While the study's scope and data limitations warrant caution, the evidence points toward the growing relevance of expectation-

driven and sentiment-based frameworks in explaining market behaviour. Overall, short-term stock market returns in India are shaped far more by expectations, liquidity, and global developments than by headline GDP figures, reinforcing the need for a more nuanced and forward-looking approach to market analysis..

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