NIFTY Index Performance: An Empirical Correlation Analysis

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Abstract
This study examines how macroeconomic factors such as Gross Domestic Growth and inflation affect the movement of the NIFTY index for the last 10 years from the data to 2014-2024. Using the Pearson correlation coefficient, an analysis was performed to understand the direction and magnitude of these variables. Quarterly data have been included in the study, and analysis reveals inconsistent but occasionally significant correlations, indicating that while macroeconomic variables influence NIFTY movement, the nature and strength of the influence vary over time. It was found that these macro factors affect NIFTY to some level, but the relationship is neither stable nor uniformly predictive. These findings offer insights for investors and policymakers, as well as future research options, such as adding more macro factors and scope for predicting the values for the next ten years.

Keywords: NIFTY 50, GDP Growth, Inflation, Stock Market Performance, Macroeconomic Indicators, Correlation Analysis, Empirical Analysis

Introduction

Therefore, when people talk about how a country is doing economically, they often look at its stock market first - kind like a mirror of the economy, right? In India, this is called NIFTY 50. It is like the go-to index, which covers 50 big, active stocks on the NSE. Now, figuring out why markets go up and down... that is a big deal. Not just investors, but also people who make financial decisions or, like, set policies and all that. And yeah, among all the things that might affect the market, two biggies keep popping up: GDP growth and inflation. These macro indicators? They are often seen to have a significant effect on market behaviour. Perhaps not always in a straight line but still worth paying attention to.

So, according to macroeconomic theory - or well, what does it say - when GDP goes up, it usually means the economy's growth, right? This tends to boost company profits, and kinda lifts investor mood. Conversely, when growth slows, people begin to worry. Now, inflation is another piece of the puzzle. It is tracked using items such as the Consumer Price Index (CPI), and it affects a number of things: how much people can buy, how much it costs to make stuff, and even how the central bank reacts with interest rates and all. All of this results in how the stock market moves. But here's the tricky bit — the whole thing is not, like, simple math. The way GDP and inflation mess with the market can shift depends on expectations, global surprises, or even just how investors feel about what is coming. However, this is not always a straight path.

This study examines how GDP growth and inflation have been connected to the ups and downs of the NIFTY 50 index using data from 2014 to 2024. Pearson's correlation was used to check if there is any solid link between these economic indicators and how the stock market behaves.

Statement of the Problem

The NIFTY 50 move is in accordance with the directions of many macro-factors. It is useful for investors and policymakers to understand how the past 10 years of NIFTY values are influenced by factors such as GDP and inflation and how it was hit by the pandemic period, as it acts as a base for adding more macro variables and adding regression for the prediction of NIFTY values in the near future.

Objective of the Study

- To investigate the relationship between GDP and Inflation rates to NIFTY Index

Literature Review

A number of studies have tried to determine how things like GDP, inflation, and other big economic indicators mess with the stock market, especially in places like India, where markets are still growing and shifting. One of the early ideas came from Fama (1981), who talked about the Efficient Market Hypothesis, basically saying that stock prices already reflect whatever information is out there, including economic stuff. Then Chen, Roll, and Ross (1986) took it further. They came up with this multifactor model — kind of like saying, "Hey, it's not just one thing — inflation, interest rates, and all that play a pretty big role in how asset returns move." So yeah, there has been a solid push to connect the dots between macro stuff and market behaviour.

In India, few studies have examined how macro factors play out in the stock market. Al-Rimawi, M. A., & Kaddumi, T. A. (2021) focused that all the factors like GDP , Inflation , interest all affects the stock market indexing. M, N. S. (2025) concludes that IIP, crude oil, gold prices, and exchange rates positively correlate with the performance of the sensex, but the WPI and inflation rates are negatively affected. Chittedi (2008) examined uncertainties in the Indian stock market and found that foreign institutional investments (FIIs) contribute significantly to market volatility, and not just India. The other emerging markets show similar results. Maysami and Koh (2000) studied Singapore's market and found that inflation and central bank moves around monetary policy have clear effects on equity prices. During the COVID-19 lockdown, the Indian stock market kinda took a hit — as Alam, Alam, and Chavali (2020) pointed out, investors reacted strongly to the whole pandemic situation, and the study showed that uncertainty kicked the market. Dickinson and Muragu (1994) suggesting that developing markets may not fully reflect available information in stock prices. Patil and Chandraswaroop Reddy (2024) confirmed a significant relationship between exchange rate, money supply, and FII movements.

Even though different studies have taken different routes and come up with all kinds of findings, one thing keeps showing up — inflation and GDP seem to be the key players when it comes to moving the stock market. Most of the literature agrees that more or less. Thus, this study focuses on this. It takes a closer look at how these two factors play out specifically in India, using data from after 2014, which is more recent and may be more relevant now. Instead of becoming too complicated, it sticks to a solid correlation-based approach to see if the links are still strong or may shift with time.

Methodology

Research Design

This study is based on a quantitative empirical research design to evaluate the correlation between macroeconomic indicators, such as GDP and inflation, and the NIFTY 50 index. Pearson's correlation coefficient was used to assess the strength and direction of the linear relationship between two variables: (i) GDP growth rate and (ii) inflation rate, with the NIFTY 50 index over the 11-year period from 2014 to 2024, and the analysis was performed in MS Excel. This approach is suitable for understanding direct relationships, and is widely used in financial and economic research. Correlation is a statistical method that measures the strength and direction of a linear relationship between two variables. By applying Pearson's correlation to quarterly data spanning ten years, this study aims to identify patterns and associations that reveal how macroeconomic factors influence stock market performance.

Methodological Limitations

Data consist of quarterly values of GDP and inflation taken for 10 years from 2014 to 2024,

including the pandemic period. Data were analysed with simple correlation only, and this extends the scope for regression in the near future.

Data Sources

The analysis used secondary data collected from the following sources:

- **NIFTY 50 index data:** National Stock Exchange (NSE), Yahoo Finance, and Investing.com
- **GDP growth rate:** Ministry of Statistics and Programme Implementation (MOSPI), Reserve Bank of India (RBI), and the World Bank
- **Inflation rate (Consumer Price Index):** RBI, MOSPI, and World Bank

The dataset comprises quarterly observations of the NIFTY closing values, corresponding GDP growth rates, and CPI inflation rates.

Statistical Technique

The primary analytical tool is Pearson's correlation coefficient (r) was calculated using Microsoft Excel and statistical software. The correlation coefficient measures the linear association between two continuous variables, with values ranging from

- 1: Perfect positive correlation
- No correlation
- 1: Perfect negative correlation

For interpretation, the significance of correlation coefficients was tested using p-values, with a threshold of $p < 0.05$ for statistical significance. Where possible, scatter plots with regression lines and R^2 values were used to visualise the relationship between variables.

Results and Data Analysis

This section presents the correlation between NIFTY 50 closing values and two macroeconomic indicators, GDP growth and inflation rate, on a quarterly basis from 2014 to 2024. Correlation was computed using Pearson's correlation coefficient, and each year was interpreted individually.

Year	Pearson's r	Strength of Correlation	p-value	Interpretation
2014	0.5994	Moderate Positive	> 0.05	GDP growth moderately aligns with NIFTY gains
2015	–0.3047	Weak Negative	0.695	Weak and insignificant inverse relationship
2016	–0.3503	Weak Negative	0.650	GDP growth did not significantly affect NIFTY
2017	–0.9611	Very Strong Negative	0.038	Statistically significant inverse correlation
2018	–0.7545	Strong Negative	0.129	Strong inverse trend but not statistically significant
2019	–0.4517	Moderate Negative	0.338	Moderate inverse trend, not significant
2020	**0.8762**	**Strong Positive**	**0.049**	**Statistically significant positive correlation**
2021	–0.9245	Very Strong Negative	0.025	Strong GDP growth did not align with NIFTY surge
2022	0.2000	Weak Positive	0.445	Minimal positive effect from GDP
2023	**–0.9953**	**Extremely Strong Negative**	**0.001**	**Highly significant negative relationship**
2024	–0.4116	Moderate Negative	0.588	Inverse trend, not statistically meaningful

Note: Bolded values indicate statistically significant correlations ($p < 0.05$)

Interpretation (GDP)

The results show no consistent pattern between GDP growth and NIFTY movement. While 2020 showed a strong, significant positive correlation, likely due to post-pandemic recovery momentum, several years, especially 2017, 2021, and 2023, exhibited strong inverse relationships, suggesting that factors beyond GDP (e.g. investor sentiment, global markets) influenced stock trends.

Table 1 correlation between NIFTY and Inflation (2014-2024)

Year	Pearson's r	Strength of Correlation	p-value	Interpretation
2014	–0.8221	Strong Negative	> 0.05	Higher inflation correlated with falling NIFTY
2015	0.5060	Moderate Positive	> 0.05	Contrary trend; inflation rise did not hurt market
2016	0.0275	Very Weak Positive	> 0.05	Near-zero relationship
2017	0.6712	Moderate Positive	> 0.05	Suggests optimism despite low inflation
2018	–0.5432	Moderate Negative	> 0.05	Falling inflation may have driven NIFTY gains
2019	0.7559	Strong Positive	> 0.05	Inflation rise did not dampen stock growth
2020	–0.5122	Moderate Negative	> 0.05	High inflation eroded NIFTY gains slightly
2021	–0.0414	No Correlation	> 0.05	Inflation had little effect on NIFTY
2022	–0.9149	Very Strong Negative	> 0.05	Market fell as inflation spiked
2023	–0.3677	Moderate Negative	> 0.05	Suggests downward pressure on market due to inflation
2024	–0.6786	Strong Negative	> 0.05	Inflation likely contributed to stock cooling

*None of the inflation correlations were statistically significant; however, 2022 and 2024 showed clear negative directional trends.

Inflation generally shows a negative correlation with NIFTY, consistent with economic theory: Higher inflation tends to reduce profit margins and investor confidence. However, the relationship lacks statistical significance year-on-year, indicating that inflation alone does not strongly predict market movement without controlling for other variables.

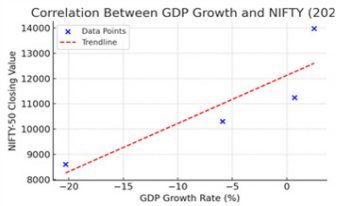

Figure 1 Correlation Between GDP Growth and NIFTY (2020)

Figure 1 shows a strong positive correlation between GDP growth and NIFTY index in 2023Here is the correlation plot for 2020, showing a strong positive linear relationship between GDP growth and the NIFTY-50 index.

- Blue dots represent actual data points (GDP vs NIFTY).
- The red dashed line is the trend line from the linear regression, confirming the upward trend.

Discussion

The results of this study illustrate the nuanced and inconsistent relationship between macroeconomic indicators, specifically GDP growth and inflation, and the NIFTY 50 Index in India. While economic theory suggests that strong GDP growth and low inflation are conducive to equity market expansion, year-wise correlation analysis reveals deviations from this assumption.

In 2020, a statistically significant positive link was observed between GDP growth and NIFTY performance. This is in line with what was expected because the Indian economy bounced back from the COVID-19 downturn, and investors felt better about the future thanks to optimism regarding recovery and policy support. However, in case of years like 2017, 2021, and 2023, strong negative correlations were observed between GDP and the NIFTY index, even when GDP growth was strong. This means that factors such as global uncertainties, fiscal deficits, or high valuations are also considered by people who buy and sell, which makes the market less responsive to changes in the domestic economy.

However, the apparent correlation did not hold for individual years. As shown in Figure 3, inflation showed a negative correlation with NIFTY in one year-2014, 2015 and 2017-but the relationship was not statistically significant. The imperfection of these illusions means that the effect of inflation can often

be largely counterbalanced by other factors such as monetary policy, global commodity prices, or capital flows. For example, in the 201ss, Chinese inflation shot upward, but the NIFTY rose. This suggests that the wane of external capital inflows and ebbing organic liquidity could not significantly affect India itself.

As per these disagreements, the big lesson is that market trends are certainly affected by macroeconomic indicators, but never to the point of absolute consistency. Behavioural policies and global macroeconomic conditions can also greatly affect the Indian stock market. The need for multifactorial investment analysis is supported by empirical evidence, and its conclusions are backed by the limits of relying on macro data alone for forecasting market movements.

Conclusion

This study investigates the correlation between macroeconomic factors such as inflation and GDP to the NIFTY 50 index over the past 10 years from to 2014-2024. It is found that these macro factors are affecting NIFTY to some level, but the relationship is neither stable nor uniformly predictive. In 2020, the strongest positive correlation was observed, reflecting the stock market's reaction to the post covid period. However, in other years, a low or negative correlation was found between and. At this point, it is not recommended that investors or policymakers depend solely on GDP and inflation to predict NIFTY behaviour.

Limitations, Recommendations and Future Research

This research focuses on two macroeconomic indicators and uses quarterly data, which revealed a problem related to this study. Future research should implement multivariate regression or time-series modelling with additional variables including interest rates, foreign institutional investments (FII), exchange rates, and global indices. The analysis of behavioural finance elements, together with macroeconomic fundamentals, would create a more complete understanding of market movements. Recommendations based on this study are that investors should take many factors into account at a time for better prediction, and taking the time horizon in detail will help to make predictions for the long run. The study is limited to a few focal areas in terms of the span of time used, macro factors included, and methodological constraints, which could limit the depth of insights into the dynamics between macroeconomic factors and the NIFTY 50.

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