

Decoding Nifty 50: Impact of Macro Economic Factors on the Indian Stock Market

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Abstract:

India is considered to be 4th largest economy as far as GDP is concerned, but major question lies that are it really growing? And what are those macro economic factors? Which has been considered as parameter of the growth? To answer this questions researcher has made an effort to check impact of the macroeconomic environment on Nifty50, as various studies shows that there has been strong relation between Nifty50 and GDP. The Indian stock market, measured by market capitalization to GDP ratio, has a significant and increasing contribution to the country's economy. This ratio has reached a 15-year high of 140.2%, amplifying that the total value of listed companies exceeds India's GDP by a substantial margin. This signifies a impactful increase in the stock market's influence on the overall economy. Thus researcher wants to test the relationship between Nifty50 & Macroeconomic variables which are inflation, interest rates, exchange rates, FII, silver prices, and gold prices. For the purpose of the research Last five years data are considered i.e 2020-2024 with descriptive research design and statistical regression is measured so as to identify the most crucial variable amongst all macroeconomic variables that affects the Nifty50. Though, study does not claim any relation amongst them before 2020 and after 2024.

Keywords:

Indian Stock Market, Inflation, Exchange Rate, Interest rate, Silver Prices, gold prices, FII, Crude Oil Prices, Nifty50

Introduction

India's economic growth is significantly influenced by the Indian stock market. Many individuals, including the government, investors, economists, politicians, and others, utilize the Indian stock market as an efficient economic indicator. Economic progress is reflected in the performance of the Indian stock market. Nifty 50, Sensex, Nifty Bank, Nifty Midcap 100 & Smallcap 100, BSE 500, BSE 200, and Nifty 500 are some of the key indicators of the Indian stock market. For a number of factors, including the fact that it represents the biggest and most liquid firms in India, serves as a benchmark for mutual funds, exchange-traded funds, and institutional investors, and has a track record of steady and robust long-term development, the Nifty 50 continues to hold its place as a major benchmark.

Indian Stock market is not functioning independently as it's influenced by various macroeconomic factors such as GDP growth rate, Inflation rate, Interest rate, Exchange rate, FII and DII investment, crude oil prices, fiscal deficit, unemployment rate, gold and silver prices, etc. Macroeconomic factors are important because they directly impact investors' confidence,

corporate earnings, and overall market movements. These factors determine market sentiments which help investors to make informed decisions on buying or selling stocks. They affect corporate profits and valuations which is important for investors to predict company earnings and stock valuation. They also provide early warning signals to help investors anticipate downturns and recovery trends before they happen, they guide FII/DII investment decisions and overall liquidity in the market and also help predict recession, economic growth, and potential crashes.

Many studies have examined the relationship between the Indian stock market and key macroeconomic indicators but limited research has been found for Nifty50 from 2020 to 2024, although it covers events like the COVID-19 pandemic and global economic shifts. The present study aims to bridge the gap of this period by analyzing the macroeconomic variables that influence the Nifty50's performance.

Objectives of the Study

- To examine the impact of macroeconomic factors on Nifty50.
- To identify which macroeconomic factor has the most extensive influence on Nifty50.

Literature Review

The association between macroeconomic variables and stock market performance has been a topic of extensive research in the field of finance. Numerous studies have analyzed various macroeconomic indicators, their effects on stock returns, and the dynamics that affect stock market volatility in various economies.

Mohapatra et al. (2025) explored the relationship between gold and the Indian stock market over a period of 15 years. They confirm a weak negative correlation, as Nifty exhibits greater volatility with gold offering stability in times of economic uncertainty. Likewise, İlarıslan (2025) investigated the influence of deposit interest rates on the stock market index and inflation rate of Turkey for the period between 2003 and 2024 and established that when the inflation rates fall below 2.67%, an increase in interest rates negatively impacts the index, while above 2.67% inflation rates positively affect the index.

Scaria and Saji (2025) used short-run movements of the call money rate, consumer price inflation, and exchange rate on the Indian manufacturing industry stock prices for the period between 2015 and 2023 and could not establish a long-run correlation between stock prices and these macroeconomic variables. Reddy (n.d.) also investigated how macroeconomic indicators influence BSE Sensex and found that interest rates, Federal reserves, and inflation are associated with prices.

Chauhan et al. (2025) analysed macroeconomic variables influencing NSE stock market returns from April 2012 to August 2024. Their findings emphasize the long-run impact of Foreign Institutional Investment (FII), Index of Industrial Production (IIP), Money Supply (MS), Wholesale Price Index (WPI), Economic Policy Uncertainty Index (EPU), Crude Oil Price (COP), and Exchange Rate (ER), whereas in the short term, FII, ER, and COP are the most important factors.

Mo et al. (2018) examined the impact of crude oil shocks on Indian stock market returns and volatility and concluded that anticipated oil demand shocks have a significant impact on stock returns and volatility, while supply shocks have no impact. Policy uncertainty shocks, however, result in negative returns and higher volatility. Ullah et al. (2017) discussed the role of macroeconomic variables on the performance of the stock market in SAARC countries and highlighted exchange rates, foreign reserves, and interest rates as main variables.

Luthra and Mahajan (2014) investigated the influence of the growth rate of GDP, inflation, gold price, and exchange rate on BSE Bankex and found that exchange rate, inflation, and GDP growth rate have a positive influence on the banking index and that gold price has a negative influence. Ahmad and Ramzan (2016) tested the macroeconomic volatility and its linkage with the Karachi Stock Exchange and found that inflation, exports, and industrial production of growth matter in influencing the stock returns.

Gurloveleen and Bhatia (2015) examined the BSE 500 index and proved that Foreign Institutional Investors and Exchange Rate alone impact average closing prices. In a similar context, Giri and Joshi (2017) examined macroeconomic variables of the Indian economy from 1979 to 2014 and established that economic growth, inflation, and exchange rates have a positive effect on stock prices, and crude oil prices have a negative effect on them because of inflationary expectations.

Singh (2014) analysed macroeconomic variables' relationship with BSE Sensex and S&P CNX Nifty and observed that gold price has a negative effect on the market. Kotha and Sahu (2016) analysed stock return from 2001 to 2015 and observed co-integration between exchange rate, money supply, WPI, and treasury bill rate with Sensex, and found that inflation and money supply positively influence stock return, while interest rate had an insignificant negative effect.

Misra (2018) established long-run causality between BSE Sensex and macroeconomic variables such as IIP, inflation, interest rate, gold price, exchange rate, foreign institutional investment, and money supply. Abbas et al. (2019) considered the stock returns and macroeconomic factors of G-7 nations and found significant interactions among industrial production, money supply, interest rate, inflation, oil price, and exchange rate.

Jareño and Negrut (2016) examined the U.S. stock market, validating that the Dow Jones and S&P 500 indices have a positive correlation with GDP and Industrial Production Index (IPI), but a negative correlation with unemployment and interest rate variables. Laichena and Obwogi (2015) examined East African Community stock exchanges and discovered that there was an inverse relationship between stock returns and interest rates, a positive relationship between stock returns and inflation, and a negative relationship between stock returns and exchange rate.

Peiró (2016) tested macroeconomic impacts on French, German, and British stock prices, and its findings were that stock returns were influenced heavily by production and interest rates, whose direction stock prices could predict twelve months ahead of time. Celebi and Hönig (2019) examined the German DAX30 index for the period 1991-2018 and discovered that major

indicators like the Composite Leading Indicator, if Export Expectations index, and CPI have lagged effects on stock returns, with differences preceding and following economic crises.

Gay (2016) examined macroeconomic determinants of stock prices in BRIC countries, observing an erratic relationship between exchange rates and stock prices, but an inverse relationship between stock prices and monthly oil prices across nations. Kirui et al. (2014) analysed stock returns in the Nairobi Securities Exchange Limited and found that exchange rates have a significant impact on stock returns, with a 1.4% decrease for each one percent depreciation. But GDP, inflation, and the treasury bill rate had no effect.

Ouma and Muriu (2014) discovered that the returns from the stock market in Kenya are strongly determined by money supply, inflation, exchange rates, and interest rates. Likewise, Tripathi and Seth (2014) studied Indian stock market performance between 1997 and 2011 and concluded that oil prices, money supply, and WPI have a long-run causal nexus with stock market performance, although the nexus is weaker in India than in the developed markets.

In short, the literature indicates that macroeconomic factors are significant in determining stock market performance. Factors that are widely researched, including inflation, interest rates, exchange rates, money supply, and foreign institutional investment, have a considerable impact on stock market returns in different economies. The nature and degree of these relationships, however, differ under different market conditions and economic frameworks.

Research Methodology

Research Gap

Several studies have been done for pre COVID era where researcher made an attempt to find the relation between the macro economic variables and index, but present study will not only find the existence of the relationship between the Nifty50 and Macroeconomics variables but also it will try explore the intensity at which this variable affects the Nifty50 post COVID era.

Research Design

The impact of particular macroeconomic factors on the Nifty 50 index is empirically investigated in this study using a Descriptive research design. Since it makes it easier to measure numerical data objectively and evaluate it statistically in order to find patterns, connections, and trends, a quantitative approach is thought to be suitable for this investigation. This framework makes it possible to examine theories about the connection between stock market performance and macroeconomic variables using econometric techniques.

The research utilizes statistical methodologies and secondary data analysis to evaluate and confirm the formulated hypotheses. Multiple linear regressions, the primary analytical tool, was employed due to its reliability in establishing the correlation between several independent variables (macroeconomic variables) and a single dependent variable (the Nifty 50 Index). SPSS software was utilized for data analysis, given its reliability, user-friendliness, and suitability for regression-based research.

Data Collection

For the current research, secondary data were collected from reputable government sources, including the Reserve Bank of India (RBI), the National Stock Exchange (NSE), and Money Control, among others. The period for which data was collected was between January - 2020 to December - 2024. The macroeconomic factors used in this study are mentioned below:

- Inflation rate from the RBI Database (measured by the Consumer Price Index - CPI)
- Silver Rate (per Kg in INR) and gold rate (per gram in INR) from RBI Database
- Exchange rate from RBI Database (Indian Rupee against the US Dollar)
- Interest rate from the RBI Database (as determined by the RBI)
- Foreign Institutional Investments (FII) from Money Control Database (Net Purchases)
- Crude Oil from other databases (Brent crude in USD per barrel)

Monthly data for each of these variables, along with the daily closing prices of Nifty 50 Index values gathered from the NSE which were converted to monthly averages for consistency.

Data Analysis Techniques

To examine the impact of macroeconomic factors on Nifty50, this study used SPSS for the multiple linear regression model. The regression model is expressed as: The regression equation is specified as:

$$\text{Nifty50} = \alpha + \beta_1 (\text{Inflation}) + \beta_2 (\text{Silver}) + \beta_3 (\text{Gold}) + \beta_4 (\text{Exchange Rate}) + \beta_5 (\text{Interest Rate}) + \beta_6 (\text{FII}) + \beta_7 (\text{Crude Oil}) + \epsilon$$

Hypothesis

H₀ : There is no significant impact of macroeconomic factors on Nifty 50.

H₁ : There is Significant impact of macroeconomic factor on the Nifty 50.

These theories are tested with the help of the MLR model. The regression coefficients' statistical significance will indicate whether the null hypothesis will be rejected in favor of the alternative. The p-value is statistically significant if it is below 0.05, if the corresponding macroeconomic indicator has a quantifiable effect on the Nifty 50 Index.

Result and Discussion

A regression analysis was conducted to determine the relationship between macroeconomic variables and the Nifty 50 average, which is derived from daily closing prices. The three major parts of the analysis were the model summary, ANOVA, and coefficient table. The interpretation of the results is given below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.967 ^a	.935	.927	1142.15779

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound

a. Predictors: (Constant), Crude Oil Price (USD per barrel) Avg, Inflation Rate As per CPI %, FII Net Purchase / Sales in Cr, Gold Price (?) Per 10 Gm Avg, Interest Rate %, Silver Price (?) Per Kg Avg, Exchange Rate of Indian Rupee vis-à-vis US Dollar

The model summary indicates a very high level of explanatory power as evident from the R Square value of 0.935, which means that the macroeconomic variables taken into consideration account for about 93.5% of the fluctuation in the Nifty 50 index. The measure of Adjusted R The ANOVA table shows that the regression model is highly significant at the 1% level overall (F = 107.333, $p < 0.001$), suggesting that the combined effect of the independent variables on the dependent variable (the Nifty 50 average) is large and not due to chance Square of 0.927, based on adjusting for the number of predictors, further testifies to the model being strong. The standard error of the estimate (1142.16) indicates an acceptable amount of prediction error.

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	980128874.761	7	140018410.680	107.333	.000 ^b
Residual	67835270.077	52	1304524.425		
Total	1047964144.837	59			

a. Dependent Variable: Nifty 50 Avg Based on Daily Closing

a. Predictors: (Constant), Crude Oil Price (USD per barrel) Avg, Inflation Rate As per CPI% %, FII Net Purchase / Sales in Cr, Gold Price (?) Per 10 Gm Avg, InterestRate% %, Silver Price (?) Per Kg Avg, Exchange Rate of Indian Rupee vis-à-vis US Dollar

(Constant)	-3031.232	8496.012		-.357	.723	-	14017.263
Inflation Rate As per CPI %	-464.508	166.116	-.120	-2.796	.007	-797.843	-131.172
Silver Price (?) Per Kg Avg	.154	.036	.456	4.294	.000	.082	.226
Gold Price (?) Per 10 Gm Avg	.088	.064	.198	1.365	.178	-.041	.217
Exchange Rate of Indian Rupee vis-à-vis US Dollar	18.935	139.899	.020	.135	.893	-261.792	299.663
Interest Rate %	311.432	284.271	.116	1.096	.278	-258.999	881.864
FII Net Purchase / Sales in Cr	-.021	.009	-.097	-2.379	.021	-.039	-.003
Crude Oil Price (USD per barrel) Avg	60.600	10.423	.294	5.814	.000	39.686	81.514

a. Dependent Variable: Nifty 50 Avg Based on Daily Closing

The General form of the equation to predict Nifty50 from inflation rate, silver and gold prices, exchange rate, Interest rate, FII, and Crude oil prices is: Predicated

$$\text{Nifty50} = -3031.232 - 464.508(\text{Inflation}) + 0.154(\text{Silver}) + 0.088(\text{Gold}) + 18.935(\text{ExchangeRate}) + 311.432(\text{Interest Rate}) - 0.021(\text{FII}) + 60.600(\text{Crude Oil}) + \epsilon t$$

Coefficient Interpretation

The rate of inflation (CPI%) has a statistically significant negative impact on the Nifty 50 index ($\beta = -464.508$, $p = 0.007$). This means that the Nifty 50 would lose approximately 464 points for every 1% rise in inflation. Elevated inflation has several adverse consequences such as increased costs of inputs, reduced purchasing power, worse real returns, and loss of investor confidence.

The Nifty 50 and the price of silver are strongly positively correlated ($\beta = 0.154$, $p < 0.001$). For each ₹1/kg rise in the price of silver, the index rises by 0.154 points. This could be because silver is both a precious metal and an industrial material, both of which are demanded more in emerging economies.

The index is significantly affected negatively by FII Net Purchases/Sales ($\beta = -0.021$, $p = 0.021$), which indicates that the Indian equities market is pinched by net withdrawals of foreign institutional investors. This depicts the sensitivity of the Nifty 50 to movements in foreign capital flows.

Crude oil prices are found to have a significant positive effect on the Nifty 50 ($\beta = 60.600$, $p < 0.001$). The positive association might reflect that there is a global economic turnaround where an increase in oil prices is associated with better-performing stock markets, though India imports a net quantity of oil.

Even though the regression model explains a lot (Adjusted $R^2 = 0.927$), not all factors were important. Interest rates, gold prices, and the Indian Rupee's exchange rate with the US dollar did not significantly affect the Nifty 50 index during the study. This result might seem surprising, but it needs more study to understand the reasons behind it.

While gold is widely regarded as a safe-haven asset that is inversely correlated with stock markets, the price of gold showed a positive but statistically non-significant relationship with the Nifty 50 ($\beta = 0.088$, $p = 0.178$). This indicates that changes in the price of gold had no significant impact on the equity index during the study period.

Furthermore, the exchange rate of the Indian Rupee against the US dollar exhibited a negative and statistically insignificant effect on the Nifty 50 ($\beta = 18.935$, $p = 0.893$). While currency fluctuations have the potential to affect corporate earnings, foreign investor sentiment, and the competitiveness of exports and imports, certain factors may mitigate or constrain their immediate impact on the stock index.

Finally, the interest rate ($\beta = 311.432$, $p = 0.278$) and the Nifty 50 index exhibited a positive relationship, although this was not statistically significant, potentially due to the influence of the policy repo rate. This observation appears to contradict financial theory, which posits that higher interest rates increase the cost of capital, thereby reducing stock value.

Hypothesis Testing

The test of the hypothesis regarding the effect of selected macroeconomic variables on the Nifty 50 index was conducted through regression analysis. The null hypothesis (H_0) was that there is no significant relationship (statistically) between the macroeconomic measure and the Nifty 50, and the alternate hypothesis (H_1) proposed a significant association with each of measures.

Based on the results of the regression analysis, the null hypothesis was rejected at the 5% level of significance for four variables: crude oil price, silver price, FII net purchases, sales, and inflation rate (CPI %). Some findings indicate that macroeconomic factors significantly affect the Nifty 50 index. Consistent with the economic theory, that increasing inflation lowers returns on equity markets, higher input costs and lower purchasing power, there was a negative between both ($\beta = -464.508$, $p = 0.007$). In contrast, the silver price demonstrated a strong positive effect ($\beta = 0.154$, $p < 0.001$) that may have to do with investors' optimism and the demand for industrial products in periods of economic growth. Of the variables that had significant impact, FII Net Purchases/Sales ($\beta = -0.021$, $p = 0.021$), with a negative coefficient, represents how sensitive the market is to movements in capital flows. Finally, however, the price of crude oil, although India is a net importer of oil, had the largest positive effect on returns ($\beta = 60.600$, $p < 0.001$), suggesting that better equity market performance is related to increases in global oil prices, which are often associated with better global economic activity.

However, reject the null hypotheses was impossible due to p-values of interest rate, exchange rate and gold price which exceed the 0.05 threshold. It implies that over the observation period these variables did not have any direct statistically significant effect on the Nifty 50 index. While these findings may seem contradictory to classic financial theory, they are a reminder of how nuanced and situational market dynamics can be in emerging economies such as India.

Conclusion and Recommendations

The study aimed to find out how macroeconomic variables impact the return on Nifty 50 index and which component is dominating and provide suggestions to policy makers, market experts and investors. The empirical study on Nifty 50 index reveals that the major macroeconomic factors like the price of crude oil, the price of silver, the FII net purchases and sales and the inflation level (% of CPI) are the statistically significant influencing factors.

The negative and statistically significant impact of the inflation rate underscores its detrimental effect on reducing market returns through increased expenses and diminished purchasing power. The strong and favorable correlations between the prices of crude oil and silver, respectively, demonstrate investor optimism and alignment with global economic trends. The negative impact of FII Net Purchases/Sales highlights the market's vulnerability to foreign capital flows. However, the index was not significantly influenced directly by the gold price, interest rate, or currency rate; this could be due to indirect or delayed effects.

Crude oil prices, exhibiting the highest standardized coefficient and statistical significance among all variables, have been identified as the most critical macroeconomic factor, underscoring their role as a global economic indicator. These findings align with the study's objectives and offer a comprehensive analysis of how various macroeconomic variables influence stock market performance in a developing nation such as India.

Implications of the Study

This paper contributes theoretically to the existing body of knowledge on stock market behavior by emphasizing the critical role of macroeconomic principles in influencing market indices, particularly in emerging markets. The findings lend support to the Efficient Market Hypothesis (EMH) insofar as stock prices incorporate publicly available macroeconomic data. However, the notable impact of commodity prices and Foreign Institutional Investor (FII) flows suggests potential inefficiencies or behavioral effects.

From a practical perspective, the findings have direct implications for portfolio managers and investors. Key indicators of market direction include inflation trends, commodity prices—particularly those of crude oil and silver—and Foreign Institutional Investor (FII) activity. Consequently, these factors require close monitoring. Market analysts can incorporate these variables into forecasting models to enhance their projections. Additionally, policymakers should recognize that monetary and fiscal policies affecting these macroeconomic indicators indirectly impact investor sentiment and stock market stability.

Given the susceptibility of the Nifty 50 to Foreign Institutional Investor (FII) flows, it is imperative to implement regulations to mitigate excessive volatility in capital flight. This objective could be achieved by enhancing the transparency of capital movement reporting or by modifying investment policies. Furthermore, maintaining market confidence necessitates the implementation of stable commodity price policies and effective inflation control measures.

Limitations and Future Research Directions

While this research provides valuable insights, it is not without limitations. Firstly, the methodology employed is based on historical data and assumes a linear relationship between macroeconomic variables and the Nifty 50 index, which may not adequately capture more complex or delayed effects. Secondly, the reliance on monthly averages may overlook short-term market fluctuations or sudden reactions. Thirdly, the analysis is restricted to a specific set of macroeconomic indicators, excluding other potentially relevant variables such as global economic events, investor sentiment, and political factors. Lastly, as the conclusions are drawn from aggregate index-level data, they may not reflect firm-level or sector-specific effects. These limitations suggest avenues for future research to explore additional variables, utilize higher-frequency data, and employ more sophisticated models.

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