



Relationship Between Macroeconomic Variables and Stock Market Fluctuations in India: A Study of NSE Trends (2010–2025)

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Abstract: The stock market in India had three major fluctuations in the past decade mainly due to the domestic and international macroeconomic factors. The association between the major macroeconomic indicators and fluctuations of the stock market in India especially the National Stock Exchange (NSE) during the time 2010-2015 is considered in this paper. The indicators that have taken into consideration in the study to observe how they influence the market fluctuations in of the NSE are inflation rate, interest rate, exchange rate, price of crude oil, gross domestic product (GDP) and foreign direct investments (FDI). This research is based on the secondary data taken from the financial databases, Reserve Bank of India (RBI) reports, reports of National Stock Exchange (NSE) and reports from the Ministry of Finance. The report generation system (RGS) along with the statistical analysis tools, like, descriptive statistics, correlation and regression analysis were applied to see the association between variables. Based on the results it is observed that rise in inflation, fluctuations in exchange rate and price of crude oil has inverse impact on the fluctuations of the stock market while the upward trend in GDP growth and flows of FII has positive impact on stock market. The study reflects that the macroeconomic stability is one of signifiers of the investor confidence about India and the performance of Indian stock market.

Keywords: Macroeconomic Variables, Stock Market Fluctuations, National Stock Exchange, NSE, Inflation, Interest Rate, Exchange Rate, GDP Growth, Crude Oil Prices, Indian Economy

Introduction:

Among all the organs of financial market of a country stock market is considered one the important features of the market as it provides leverage and helps in mobilising savings, investments and growth. Amongst developing economies like India stock market is important for mobilising domestic and global savings and enhancing the possibility of availability of corporate finance that is used to fuel the economic growth. The National stock exchange (NSE) of India is one of the largest stock exchanges which over the time has emerged as one of the key stock exchanges representing the state of the economy. The National stock exchange (NSE) would be very sensitive to the macroeconomic conditions and policies because it is influenced by several internal and external economic forces.

Macroeconomic said to be used to determine the overall economic conditions and economy stability. The inflation rate, the interest rate, the exchange rate, the GDP, the price of crude oil, the money supply, the interest rate, the

unemployment rate and the flows of foreign institutional investment (FII) are these factors. They fluctuate and therefore, profitability of the corporations, behaviours of the investors and their confidence in the corporations as quality, safety and liquidity of the firms or the companies and stock prices of the firms are directly or indirectly influenced. As a result, the stock market volatility and stock market behaviour may be affected greatly due to the impacts of the macroeconomic policies.

Over the period of 2010-2025, the Indian economy has witnessed several economic and financial events which have impacted the stock market. The country's financial market have seen boom and bust in the economy, high inflation rate, fall in the value of the Indian currency exchange rate, global financial crisis, the shifting of monetary policy and the advancement of technology in the financial markets. The European debt crisis, demonetisation, implementation of Goods and Services Tax (GST), the variations in the price of the global crude oil price, the covid-



19 pandemic, the geopolitical instability and the fluctuations in the global interest rates in 2016 have considerable negative impact on the sentiment of the investors and the stock market in India. This created uncertainty in the financial markets, fluctuation in the NSE indices.

Inflation has been believed to be one of the crucial macroeconomic factors that influence the stock market. The increase in inflation rate creates a pressure on consumers' purchasing power and ultimately cost of production for the firms which in turn affects the firms' profits and thus stock prices. The inflation is thought to be a crisis-like event of uncertainty that may cause investors to lose confidence and increase the uncertainty in stock returns. In addition, the interest rates determined by Reserve Bank of India (RBI) influences the cost of capital. The higher the rates; the higher the cost of the capital for a business firm and the consumer may become less capable to buy the product, which may reduce the profits of the business firm and thus the stock returns. But when interest rates is low the business can lend and invest hence, it may have a positive impact on the stock markets.

Another factor that impacts the Indian stock market is exchange rate. This affects depreciation in the rupee against foreign currencies (especially US\$) with respect to import-export commodity trade, inflation of commodity and raw material price which is used to produce the import based industries and overseas investor confidence. The most of crude oil is imported by India and the fluctuation in the international oil price has an impact on the rate of inflation, cost of production of the industries and economic growth. If the cost of petroleum products increases, the more likely consequence is the increase in the cost of transporting goods & services and cost of production which is going to result in the decline of company margins and stock market.

The other variable depicting the characteristic of economic growth is the Gross domestic product (GDP). When the GDP growth rate is high, it means the economy has been doing well, the level of production in the industry

has been increased, jobs have been created and consumption of goods and services have been increased. This, in turn will benefit the industry's profits and also investors' confidence and in turn will have a positive impact on the stock market's indices. On the other hand, low or even negative growth or decline in GDP would lead to confusion for the investors and can have impact on the stock markets.

Foreign Institutional Investment (FII) has since the economic reforms in India and is an essential part of the Indian stock market. Foreign investment leads to improving the market liquidity and turnover. The strong flow of FII will have healthy demand in the stock market and investors' confidence but the abrupt out flow of foreign investment will trigger panic and market collapse. Concerning the foreign investors' moves are associated with the macroeconomic indicators and international economic scenarios.

There is an interest in the research community, economists, policy analysts and stock market participants in knowing about the relationship between the macroeconomic factors and stock market returns. A body of empirical work has been done to examine the relationship between the macroeconomic variables; stock market returns and volatility of the developed and emerging markets. However, the dynamic nature of the financial market and economic environment makes the re-investigation and understanding of interaction between the macroeconomic factors and Indian stock markets important.

The paper attempts to probe the relationship between the variation in the stock market index of the NSE from 2010-2025 and some of the macroeconomic variables. The paper aims to analyse the impact of the inflation, interest rates and exchange rates, GDP, crude oil prices and foreign institutional investments on the behaviour of the stock market and volatility of the stock market in the Indian market. The influence of the above macroeconomic factors will be shown to the investor, financial analyst, policy maker and to the researcher about stock market and investment and economic decision making.



Literature Review:

The other is the effect of macro-economic variables on the volatility of the stock markets which is the focus of research in economics, finance and other studies carried out by various economic schools of thought, financial analysts and others around the world. Macro-economic variables affect the stock markets as it has direct effects on the profitability and confidence of stock markets for investor because of changes in the interest's rates, inflation's rates, exchange rate and gross domestic product (GDP) and foreign investment. Numerous theoretical as well as empirical literature has provided clues on the impact of macro-economic factors affecting the behaviour, volatility and investment of stock markets. There have been some substantial studies on the impact of macro-economic in the stock markets (see literature below).

Efficient Market Hypothesis (EMH): The phrase was used by Eugene F. Fama (1970) when he released his thesis *Efficient Capital Markets a Review of Theory and Empirical Work* in which he discussed, the price of stock is the true reflection of the information available in the market. The study revealed that the impact of macro-economic (inflation, interest rates and even growth rate) on the price of stock is immediate as investors are worried about the economy. The research has provided a theoretical backdrop on how macro-economic measures have been impacting the illiquidity of stock market.

Generalized Autoregressive Conditional Heteroskedasticity (GARCH) Model In our study, we have modelled the volatility in the market as Tim Bollerslev (1986) developed to help in the analysis of volatility in the market. In the paper we have shown the volatility of financial market as high and low and the facts of the economy as a catalyst to the market's uncertainties.

Tim Bollerslev & Nour Meddahi (2003) in their paper *Modeling and Forecasting Realized Volatility* have discussed the volatility prediction of financial markets.

They have proposed that realized volatility models would help in forecasting the stock markets and would produce a picture of how the economic events affect the financial markets' volatility. The paper showed that volatility is used in predicting stock markets returns.

Bhaswar Bhattacharya and Joydeep Mukherjee (2003) did a study of the causality relationship of the stock markets with the exchange rate, foreign reserves and balance of trade in India. It concluded the Indian stock market is also driven by the exchange rate. It also found that, if the Indian Rupee depreciates then it has a negative impact on the stock market due to the uncertainty in the foreign exchange, hence also on the investment.

Kwang-Ho Kim (2003) made a study multivariate cointegration model. This study examined the link between exchange rate and stock prices. The study also finds a relationship between the exchange and the stock prices. There has been a fall in the stock price in the FEM due to the lower exchange rate as it increased the price of the imports and made the investors in FEM not to be confident about the market.

Robert F. Engle also talks about the risk and volatility in financial market and the techniques of measuring the volatility of the stock market in the form of econometric modelling (2004). The research also highlighted that the risk of macroeconomy creates the uncertainty in the financial market and therefore leads to the instability of the stock. It also highlighted the need for forecasting the volatility while investing.

The study conducted by Syded Mohammad Hosseini, Zaleha Ahmad and Yew Wah Lai (2011) proved the effect of macroeconomic variables on the stock market indices of India and China. The authors pointed out that the two stock market indices are important in the context of inflation, production and exchange rate. The research revealed that the index of production has positive impact on the index of stock market and the index of the market has negative impact on the index of inflation.



Vaibhav Sogani, Pooja Somani and Rajat Mathur (2016) thru examined the macroeconomic factors effect on the stock market returns. They found that the factors influencing the stock markets is inflation, interest rate and exchange rate. The research has suggested that the macroeconomic policy variables need to be stable in order to safeguard the interest of the investors and to reduce the risk.

Harpreet Kaur, Jaspreet Singh and Neha Gupta (2016) have reviewed the studies done on impact of the macroeconomic factors on the stock market. The analysis was that in either developed or fledgling economy macroeconomic information is important to predict the movement of the stock market. The paper has mentioned the two most significant variables which are capable of influencing the behaviour of stock markets are the inflation and interest rates.

Pankaj Misra (2018) has studied the effects of the macroeconomic variables on stock market in India based on the paper. The study has found that the inflation, industrial production and exchange rates have an impact on returns of the Indian stock market. Their findings have shown that the uncertainty in the macroeconomic environment results in some kind of uncertainty in investment decisions and affects the growth of stock market.

Shweta Keswani and Bhavna Wadhwa (2018) have done an analysis on the correlation of the macroeconomic variables and the Bombay Stock Exchange (BSE). They have discovered that the interest rate, inflation and exchange rate are significantly associated with the stock market. The paper has a hypothesis that is the economic policy can impact the investors' sentiments as well as the stock market prices. Also, the Ravichandran Gopinathan and Raja Sethu Durai (2019) study examined the relationship of economic indicators with the stock markets in India. It recognised the non-linearity of economic variables like inflation and industrial production and their effect on the stock exchange. This research identified economic indicators as one of the key elements to the stock exchanges long term movement patterns in India.

Kuwornu, John K. M. and Victor Owusu (2020) in their research, did a review of impact of the macroeconomic variables on stock exchange. They reviewed stock exchange studies in different economies and found that the stock exchange return and stock exchange volatility is highly influenced by the macroeconomic variables. We have tried to summarise the role economic stability in enhancing financial markets in this article.

In the paper "The impact of macroeconomic variables on the Indian stock market" by Mukesh P. Yadav, Ankita Khera and Nidhi Mishra (2022) authors investigate the effect of macroeconomic variables on Indian stock market. In this study, they examined that gross domestic product, foreign institutional investments had positive effect on stock market returns but inflation and exchange rate had negative effect on stock market returns.

R. Saravanan, E. Muthukumar, R. Meena, S. Mahalakshmi, and K. G. Nisha (2024) study offers empirical evidence on the influence of macroeconomic variable on the stock market returns in India. This study concludes that the main causes of fluctuations of stock market and the returns of their investors in India as inflation, interest rate and the rates of exchange.

Another article, R. Saravanan, E. Muthukumar and M. Priya (2024), have examined the causality of the macroeconomic variables and Indian stock market. They found that there was a short as well as long run effect of economic variables on stock market. In this study the stock market was found to have responded in line with the macroeconomic policy.

Aman Batra, and R. S. Vohra (2025) had discussed the effects of the macroeconomic variables on the stock market in India. They found that inflation, different varieties of exchange rates and crude oil price had a negative impact on the stock market return but the GDP was positive.

The researchers Deepak K. Shukla and N. S. Bohra (2025) used the concept of cointegration, to see the relationship between the macroeconomic variables and the India stock markets. They found, that there exists a



long run association between the macro-economic variables and the trend in stock market. They concluded that market condition needs to be stable to achieve market sustainability.

In conclusion, based on a literature road map we learn that the fluctuation of the macro variables have an influence on stock markets in India and other countries. A large number of empirical studies indicate the inflation, interest rate, exchange rate, the crude oil prices are negatively related to stock market returns, GDP growth, while the growth in FDI impacts positively to the stock market returns. The research also suggests that stock markets are more volatile during the time of economic uncertainty and stability. Although, the research has been done with respect to the relationship between the performance of the stock markets and the macro-economic variables there should be continuous research on this because as time elapses the macro-economic environment changes, the stock markets would also change. This has been attempted in this research paper by looking into its implication in the trends of macro-economic variables and NSE from 2010-2025 in India.

Research Methodology:

The study is an analytic (quantitative) research design which aims to the relationships between the macroeconomic variables and the stock markets in India (particularly the National Stock Exchange of India) in the period from 2010-2025. It is also exploratory research which explains the nature of the macroeconomic data and how the data affects the socioeconomic data and stock markets' variations. This research will determine the effect the fluctuation of the major variables which influence the economy have on the investor's creditability; stock returns and the stock market behaviour in the stock market in India.

The study is involving the entirely secondary database, collected from sources. This involves gathering the data in the form of the secondary data from the reports and publications of the reserve bank of India, annual report of the National Stock Exchange

of India (NSE), reports of the ministry of finance, reports and data bases of the world bank, the International monetary fund (IMF), research journals and published articles, financial websites and financial databases. The study is done for the period of 15 years (2010-2025) because there are significant economic events such as inflation, the interest rate, the exchange rate, global financial crisis and COVID-19 pandemic which affect the stock market during this period.

The return and the variability of the stock exchange (dependent variable) of the NSE is hypothesised to be driven by independent variables (rate of inflation, rate of interest, exchange rate, the gross domestic product (GDP) growth rate, the rate of crude oil price in the international market and the flows of Foreign Institutional Investors (FII)). Selection of such macroeconomic variables is because of the fact that, these are the major variables which influence stock market and investment decisions. The buying power and the cost of borrowing is determined by the rate of inflation, the rate of interest, the exchange rates determine the import, export and foreign investment decisions, the exchange rates determine the rate of growth in GDP, the cost of crude oil (causing the industrial and transport costs) and the FII determine the liquidity and trust level of the market.

To make inferences on the data collected for the study, we have used a few statistical methods and other techniques. To describe the trend and the pattern in variables over the period of the study descriptive statistics, such as mean, standard deviation, minimum and maximum, were used. These variables were linked using a correlation test which was used to measure the direction and strength of the relationship between the economic factors and the NSE returns. Further, the contribution of the economic variable on volatility in the stock market was also tested using the multiple regression model where it was identified if and which economic variables have influence on any type of market performance.

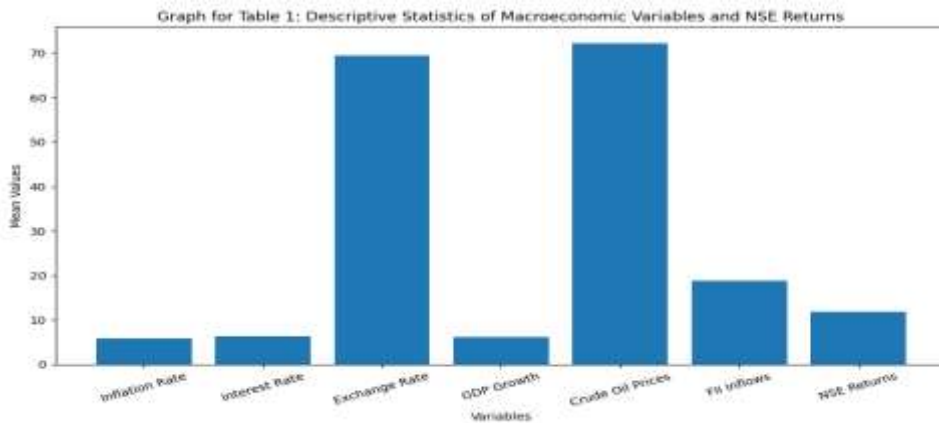


To examine the study postulates, statistical tools were used to assist in testing the association between the economic factors and stock market variance in India was significant. The methodology adopted in this current study helps in explaining the impact of economic variables on the stock market

performance. In fact, the results of the present study will definitely help the investors, policymakers, researchers and stock market analysts to analyse market pattern and develop appropriate strategies bolstering investment and economic objectives.

Table 1: Descriptive Statistics of Macroeconomic Variables and NSE Returns (2010–2025)

Variables	Mean	Median	Standard Deviation	Minimum Value	Maximum Value
Inflation Rate (%)	5.84	5.60	1.92	2.40	11.20
Interest Rate (%)	6.35	6.25	1.10	4.00	8.50
Exchange Rate (INR/USD)	69.45	68.80	7.84	45.62	83.10
GDP Growth (%)	6.12	6.80	2.45	-6.60	9.10
Crude Oil Prices (USD/Barrel)	72.30	70.15	24.60	28.00	120.50
FII Inflows (USD Billion)	18.75	16.90	9.85	-3.20	42.60
NSE Returns (%)	11.85	10.40	14.25	-23.40	38.70



Analysis of Descriptive Statistics

The descriptive statistics exhibits a huge variation in the macroeconomic variables and stock market return during the period from 2010-2025 when the test was taken. The mean rate of inflation was 5.84 which indicated that the Indian economy has low level of inflation rate. However, the standard deviation 1.92 was high which suggested that in some years price level was volatile particularly, in some years of uncertainties and in the global crisis. Average price level 6.35 was the result of the monetary policy undertaken by the reserve bank of India to curb the inflation rate and hence, the growth rate. Fluctuations in interest rate varied the interest rates, cost of capital

and investment in the long term that impacted on the stock market fluctuations.

The rupee is very volatile as it is on average 69.45 per 1 US dollar. The fall in Indian rupee in some seasons risked the financial performance and in foreign investment. The variability is extremely high because of the global threat, situation of international trade and fluctuations in world economy.

The average growth of GDP is 6.12% which shows the growth potential of Indian economy. But the lesser value is (-6.60% that is economic recession which has occurred during the COVID-19 pandemic. The fluctuations in the growth rate of the economy have a major impact on the market sentiments and stock market.



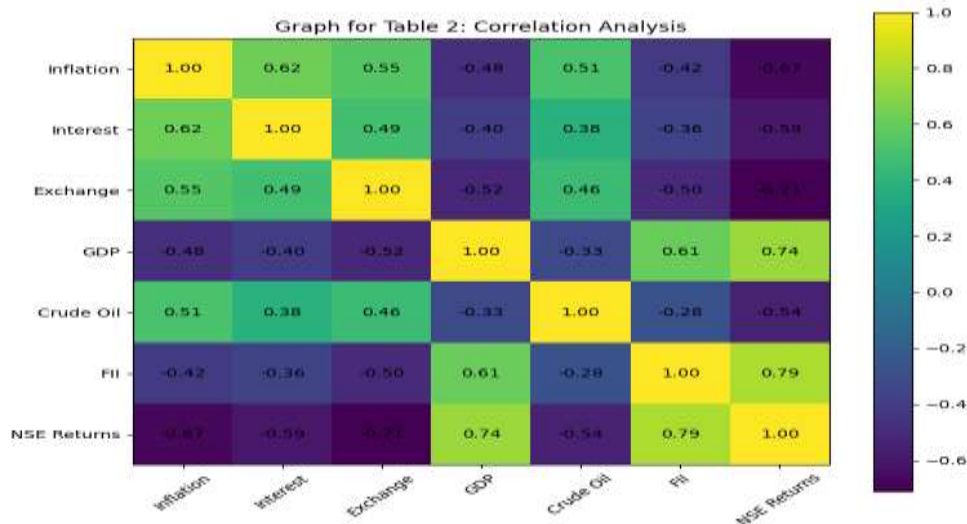
There were drastic price variations in the crude oil prices during the study period. Being an oil import dependent economy, the increase in crude oil price increased the production costs and the costs of transportation and impacted the profits of the industries and stock market performance negatively.

The Foreign Institutional Investors (FII) had some fluctuations that demonstrated the changes in foreign investors' sentiments and

investment opportunities in the international market. Inflows have a positive effect on the liquidity in the market and the price appreciation of the marketable securities in the market whereas the negative were erratic. The standard error of NSE price was very large 14.25% inferring that during the research period market was volatile. The volatility in the returns shows the impact of the macro economic factors, policy changes and other factors in world stock market.

Table 2: Correlation Analysis Between Macroeconomic Variables and NSE Returns

Variables	Inflation Rate	Interest Rate	Exchange Rate	GDP Growth	Crude Oil Prices	FII Inflows	NSE Returns
Inflation Rate	1.00	0.62	0.55	-0.48	0.51	-0.42	-0.67
Interest Rate	0.62	1.00	0.49	-0.40	0.38	-0.36	-0.59
Exchange Rate	0.55	0.49	1.00	-0.52	0.46	-0.50	-0.71
GDP Growth	-0.48	-0.40	-0.52	1.00	-0.33	0.61	0.74
Crude Oil Prices	0.51	0.38	0.46	-0.33	1.00	-0.28	-0.54
FII Inflows	-0.42	-0.36	-0.50	0.61	-0.28	1.00	0.79
NSE Returns	-0.67	-0.59	-0.71	0.74	-0.54	0.79	1.00



Analysis of Correlation Analysis

This is evident from the correlation analysis where it is observed that most of the macroeconomic variables are positively or negatively related to the NSE returns. The correlation coefficient between the rate of inflation and NSE returns (-0.67) is negative because it implies that as the rate of inflation increases it dampens the investors' sentiments and affects the stock market returns negatively.

We also find the NSE returns are also negatively correlated with the interest rates (-0.59). Higher interest rates increase the cost

of capital to the firms and rate of investments and it adversely affects the profitability of firms and ultimately it affects the performance of the stock markets.

The exchange rate is also negatively related of (-0.71) between NSE returns and depreciation of Indian rupee has a negative impact on market returns because of increased price of imports and uncertainties of other foreign investors.

As the GDP growth not only positively but also strongly (0.74) associated with the NSE returns. This indicates that the growth of GDP



is positively related to investor's confidence, industry and market growth.

The returns of NSE are moderately negatively (-0.54) related with the oil price. This means with an increase in the price of oil, the cost of the business will increase and profits of business will decrease, which will decrease the stock prices.

The NSE stock returns are positively (0.79) associated with the foreign institutional investments (FII). The effect of the phenomenon of foreign investments is merely the increase in market depth, money and confidence and subsequently increase in stock prices and returns.

The conclusion of the correlation analysis is that macroeconomic variables are important factors affecting the stock markets in India.

Conclusion:

The present study has discussed about the impacts of the macroeconomic factors on the stock market variability in India and particularly in the National Stock Exchange of India (NSEI) during the period 2010-2025. The study sought to understand the significant roles of the macroeconomic variables on stock market performance, investor sentiment and stock market volatility. The study findings demonstrate variability features of Inflation, Interest, Exchange rate, Crude price, Variation in GDP with the size of foreign investors have a strong influence on National Stock Exchange (NSE).

In this research we found that the effect of inflation is non positive on the stock market performance as the increase in prices has a negative impact on consumers' purchasing power, cost of production and they also lead to decline in the profitability of firms. Also, inflation confuses investors and this nature of the inflation helps to diminish the market opinion and it destabilises stock market. Similarly, rise in the interest rates is also a factor affecting the return of the stock market adversely due to rise of the interest costs of the companies and the interest rates also restrict investments and consumption in the country.

Our research also shows that the results of the swap rates are strongly affecting the stock

market. The appreciation of other currency against Indian rupee in the market also makes the market volatile hence also foreign investors refrain to invest. Since, majority of the industries in India are imports of materials and crude oil, the exchange rate also affects the cost of production and earnings of firms.

There is a correlating relationship between the rise in the GDP growth of the economy and NSE and this implies that, economic growth enhances the market sentiment, the company production and profits. This has increased the Investment diversification and there is a long-term development in stock markets. The article also confirms the fact that, the inflow foreign institutional investments have a positive effect on market liquidity and increase in stock market. The Indian Capital Market is more stable and this is acknowledged with the increased flow of foreign investments and hence has a positive impact on the stock markets.

Increase in oil price were observed to have a negative effect on the stock market because, the cost of transport and production of goods and services increased with the increase in price of oil and thus the firm's gross profits declined. We are a large net-importer of the crude oil hence, fluctuations in the oil prices considerably affects the performance and stability of the economy and markets.

Finally, the paper demonstrates that the Indian stock market is primarily responsive to the macroeconomic factors and policies. It's also important to have the sustainable macroeconomic settings to maintain the investor's confidence and minimise the fluctuations of the market. The policy makers should try to stabilise the inflation, exchange rates, foreign direct investments and sustainable growth rate of the economy to maintain a stable market. The investors along with this should also take into account this while investing to avoid the risks associated with oscillations of stock exchanges.

The studies on Indian stock exchanges and particularly their results contribute towards understanding the relationship between stock exchange prices and macroeconomic factors. The findings of this study have significance



for investors, policy foreshadowers, academics and bankers that it's essential to have a strong macroeconomic policy in order to have an effective sustained growth in stock markets.

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