



# IMPACT OF MACROECONOMIC VARIABLES ON STOCK MARKET PERFORMAMNCE: A REVIEW OF LITERATURE

**Mr. Aditya Prasad Sahoo**  
PhD Research Scholar,  
KIIT University,  
Bhubaneswar

**Dr B.C.M. Patnaik**  
Professor,  
KIIT School of Management,  
KIIT University,  
Bhubaneswar

**Dr. Yajnya Dutta Nayak**  
Assistant Professor,  
PG Dept. of Commerce,  
Khalli Kote Auto. College,  
Berhampur.

## ABSTRACT

*Of late increasing attention is being paid to the relationship between the stock market and the real economy both by economists and finance specialists. It is in fact hard to imagine a world without stock markets now. In the contemporary scenario, which can be described by increasing integration of the financial markets and implementation of various stock market reform measures in India, the activities in the stock markets and their relationships with the macro economy have assumed significant importance. The present work is an attempt to examine the impact of relationships between macroeconomic variables and the share price index. The purpose is to make a finer point with respect to the relationship between stock market and its determinants.*

**KEY WORDS:** Stock market, Economic variables, Performance, BSE, NSE, Indices

## 1. INTRODUCTION

Due to ongoing economic upheaval causing stock markets to behave in an erratic and volatile manner, investors need to be aware and be proactive in order to preserve their wealth. No economist or financial analyst would be able to predict the direction the stock markets would take with certainty, but knowing the factors that may have a direct impact on share price could help inspire calm in a financial world wreaked with havoc and chaos. Macroeconomics analyses the behaviour of the aggregate variables. It simplifies the complicated details of the economy using a few basic fundamentals. The core of these fundamentals is the connections among the major markets. The major markets that coordinate the macroeconomic activities are: the goods and services market (product market), stock market, money market, labour market, natural resources market, foreign exchange market, and foreign markets. Decisions in these markets are coordinated through prices. Any change in market demand and supply is reflected in prices. Macroeconomic variables have systematic effects on

stock market returns. Asset prices depend on their exposure to fundamental variables describing the economy. Any systematic variable that affects the economy at the same time affects the return of a single stock and consequently the stock market return as a whole. Thus, these variables are the systematic risk factors. For a better understanding of underlying issues pertaining to the dynamics of macroeconomic variables and stock market, literature have been bifurcated into the two broad categories: Indian Literatures and International Literatures.

## 2. OBJECTIVES OF THE STUDY

1. To find out the relationship between macro factors and stock market through review of literature.
2. To find out the underlying issues pertaining to the dynamics of macroeconomic variables and stock market from global perspective.
3. To see the impact of impact of each macroeconomic variable on Indian stock market individually.



### 3. RESEARCH METHODOLOGY

There are many approaches and perspectives in the broad field of relationship between economic variables and stock market research. For the purpose of this article elaboration, we analyzed the contemporary scientific publications and then synthesized the relevant areas, in the historical context. As a supporting method, the progressive summarization was employed, mainly due to phenomena examination. The pertinent information was extracted from the electronic databases resources, as the secondary source of information. This information serves as a base for inductive reasoning and a schema composition which summarizes the findings. The article has a merit of methodological and theoretical layers, especially in the field of finance and economic sciences.

### 4. LITERATURE REVIEW-BASED STUDY

#### A. Impact of macroeconomic variables on stock market from Indian perspective

**Naka, et. al. (1998)** the study analysed relationships among selected macroeconomic variables and the Indian stock market. By employing a vector error correction model, the Analysis finds that three long-term equilibrium relationships exist among these variables. The results suggest that domestic inflation is the most severe deterrent to Indian stock market performance, and domestic output growth is its predominant driving force. After accounting for macroeconomic factors, the Indian market still appears to be drawn downward by a residual negative trend.

**Pethe and Karnik (2000)** using Indian data for April 1992 to December 1997, attempts to find the way in which stock price indices are affected by and affect other crucial macroeconomic variables in India. The study of course avers that in the absence of cointegration it is not legitimate to test for causality between a pair of variables and it does so in view of the importance attached to the relation between the state of economy and stock markets. The study reports weak causality running from IIP to share price index (Sensex and Nifty) but not the other way round. In other words, it holds the view that the state of economy affects stock prices.

**Bhattacharya and Mukherjee (2002)** investigated the nature of the causal relationship between BSE Sensitive Index and the five macroeconomic aggregates in India (i.e., IIP, money supply, national income, interest rate and inflation rate) using monthly data for the period 1992- 93 to 2000. By applying the techniques of unit- root tests, co-integration and the long-run Granger non-causality test recently proposed by Toda and Yamamoto (1995), their major findings suggested that there was no causal linkage between stock prices and money supply, national

income and interest rate while IIP lead the stock price, and there was two- way causation between stock price and inflation rate.

**Mishra (2004)** by using monthly data for the period 1992 to 2002, examined the relationship between stock market and foreign exchange markets using Granger causality test and Vector Auto Regression technique study suggested that there is no Granger causality between the exchange rate return and stock return.

**Bhavna (2006)** The research investigated the Fama and French three-factor model of stock returns along with its variants, including the one-factor Capital Asset Pricing Model for 79 stocks listed on the BSE-100 stock market index for India. These sample stocks are split into six portfolios sorted on size and book-to-market equity ratio. A strong evidence for the market factor in all the portfolios is being regarded with having highest explanatory power.

**Ahmed (2008)** studied and found the nature of the causal relationships between stock prices (i.e., Nifty and Sensex) and the key macroeconomic variables (i.e., IIP, FDI, exports, money supply, exchange rate, interest rate) representing real and financial sectors of India. Using quarterly data, Johansen's approach of cointegration and Toda and Yamamoto (1995) Granger causality test have been applied to explore the long-run relationships while BVAR modelling for variance decomposition and impulse response functions has been applied to examine short run relationships. The study indicates that stock prices in India lead economic activity except movement in interest rate which seems to lead the stock prices.

**Kanakaraj, et. al. (2008)** has examined the trend of stock prices and various macroeconomic variables between the time periods 1997-2007. They have tried to explore upon and answer that if the recent stock market boom can be explained in the terms of macroeconomic fundamentals and have concluded by recommending a strong relationship between the two. The GDP growth in India has grown consistently at high levels touching the highest average from 2003-04 to 2006-07 since Independence, and is strongly backed by manufacturing sector growth and services sector growth.

#### B. Impact of macroeconomic variables on stock market from International perspective

**Fedorova, Wallenius and Collan (2014)** This paper studies the impact of euro area macroeconomic announcements on CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa) stock markets. The data used is from between 2007 and 2012. Euro area macroeconomic news is shown to affect CIVETS stock market volatility and in some instances the stock returns. Evidence on the impact of overall European macroeconomic news on stock market volatility is found for Colombia, Vietnam, Egypt, and Turkey. European announcements about



GDP, retail sales, and unemployment have a significant effect on the stock returns. According to results, CIVETS stock markets seem to exhibit a negative relationship between market returns and volatility: negative news have a leverage effect for the most of CIVETS stock markets, as greater volatility is generated by negative than by positive shocks.

**Fama (1981)** the study documented evidence of a strong positive relationship between equity returns and real economic activities such as industrial production, capital expenditures and Gross National Product (GNP), while a negative relationship was found between the share market returns and inflation in the US market. Following Fama (1981), Chen et al. (1986) documented that macroeconomic variables such as industrial production, changes in the risk premium and variations in the yield curve were significant factors in explaining the stock returns.

**Feldstein (1983)** this paper exhibits a crucial cause of the share prices to rise during decade of substantial inflation during the period of 1967- 1976 had been studied to understand the structural relation between the inflation and share prices. An explicit portfolio model could derive asset demand equations from expected utility maximisation and could recognise the indirect ways for the individual to hold assets in a tax favour way.

**Chen et., al. (1986)** the study tests whether innovations in macroeconomic variables are risks that are rewarded in the stock market. Financial theory suggests that the following macro-economic variables should systematically affect stock market returns: the spread between long and short interest rates, expected and unexpected inflation, industrial production, and the spread between high- and low-grade bonds. The analysis finds that these sources of risk are significantly priced. Furthermore, neither the market portfolio nor aggregate consumption is priced separately. They also find that oil price risk is not separately re-warded in the stock market.

**Kaul (1987)** this paper explores that the relation between stock returns and inflation is caused by the equilibrium process in the monetary sector. More importantly, these relations vary over time in a systematic manner depending on the influence of money demand and supply factors. Post-war evidence from the United States, Canada, the United Kingdom and Germany indicates that the negative stock return inflation relations are caused by money demand and counter-cyclical money supply effects. On the other hand, pro-cyclical movements in money, inflation, and stock prices during the 1930's lead to relations which are either positive or insignificant.

**Sadeghi (1992)** paper explored the empirical evidence on the relationship between astonishing changes in macroeconomic variables and Australian stock returns over the period 1980-1991. The results

suggest that stock returns are positively correlated with any surprise news in the current account deficit, the exchange rate and growth rate of real GDP, and negatively correlated with surprise news about the inflation rate and interest rates. Stock returns are also positively correlated with the unexpected unemployment rate and negatively correlated to revisions in the expected unemployment rate. The results additionally suggest that market portfolios can notice the impact of common economic shocks better than the portfolios of the two main subsectors.

**Abugri (2006)** this paper gave a noble discussion about the dynamics of macroeconomic variables like exchange rates, interest rates industrial production and money supply in four Latin American countries significantly explain stock market returns. By using vector autoregressive (VAR) model, the study signifies that the global factors are consistently important in explaining the returns in all the markets.

### **C. Studies investigating the relationship between Inflation & Stock Market**

**Kaul and Seyhun (1990)** in a paper on "Relative Price Variability, Real shocks, and the Stock Market" investigate the effects of relative price variability on output and stock returns and gauge the extent to which inflation proxies for relative price variability in stock return-inflation regressions. The evidence shows that the negative relations between stock returns and expected and unexpected inflation proxy for the negative effects or relative price variability on the stock market.

**Henry (2002)** in his paper on "Is Disinflation Good for the Stock Market?" finds that the stock market appreciates by an average of 24 percent in real dollar terms when countries attempt to stabilize annual inflation rates that are greater than 40 percent. In contrast, the average market response is 0 when the pre-stabilization rate of inflation is less than 40 percent. These results suggest that the potential long-run benefits of stabilization may dominate short-run costs at high levels of inflation, but at low to moderate levels of inflation, benefits may be offset by costs in a present value sense.

**Dupor and Conley (2004)** in a paper on "The Fed Response to Equity Prices and Inflation" studies how Federal Reserve interest rate policy, from 1979-2004, responds to an aggregate measure of stock market activity under high versus low inflation. Two conventional findings of research are that the federal Reserve: 1) raises the short-term real interest rate in response to inflation and (ii) does not change policy in response to equity price movements. The findings of the researchers confirm (i) and (ii) for the high inflation period. However, during the low inflation period, the conclusions are different.



**Hondroyiannis and Papapetrou (2006)** in a paper on “Stock returns and inflation in Greece: A Markov switching approach” studied the dynamic relationship between real stock returns and expected and unexpected inflation utilizing a Markov Switching vector autoregressive model (MS-VAR). The empirical evidence suggests that real stock returns are not related to expected and unexpected inflation and this result is independent of the method used to separate inflation into the two components. Rather, the results suggest that stock market movements are regime dependent, implying that stock market performance is not predictable.

**Chao Wei (2006)** used VAR results to advocate in inflation illusion as the explanation for the positive association between in inflation and the dividend yield. Contrary to their results, we find that a fully rational dynamic general equilibrium model can generate a positive correlation between the dividend yield and inflation of comparable size to its data counterpart. The model results support a proxy hypothesis, according to which, a third factor, which in our model represents technology shocks, moves both inflation and the dividend yield in the same direction, resulting in a positive correlation between the two.

#### **D. Studies investigating the relationship between GDP & Stock Market**

**Comincioli and Wesleyan’s (1996)** findings in a paper on “The Stock Market as a Leading Indicator: An Application of Granger Causality” indicates a "causal" relationship between the stock market and the economy. We found that while stock prices Granger-caused economic activity, no reverse causality was observed. Furthermore, we found that statistically significant lag lengths between fluctuations in the stock market and changes in the real economy are relatively short. The longest significant lag length observed from the results was three quarters.

**Humpe and Macmillan (2005)** analysed the extent to which macroeconomic variables explained stock market movements in the US and Japan. Using a log-linear model, they found that a 1 percent increase in industrial production triggered a 1.09 per cent increase in US stock prices whilst a 1 per cent increase in Japanese industrial production triggered a 0.4 per cent increase in Japanese stock prices. Both parameters were highly statistically significant.

**Hong, Torous and Valkanov (2007)** in a paper on “Do industries lead stock markets? investigated whether the returns of industry portfolios predict stock market movements. In the US, a significant number of industry returns, including retail, services, commercial real estate, metal, and petroleum, forecast the stock market by up to two months. Moreover, the propensity of an industry to predict the market is correlated with its propensity to forecast various indicators of

economic activity. The eight largest non-US stock markets show remarkably similar patterns. These findings suggested that stock markets react with a delay to information contained in industry returns about their fundamentals and that information diffuses only gradually across markets.

**Gevit Duca (2007)** observed unidirectional causality between GDP and stock prices implies that the level of economic activity in a country, can potentially depend on the stock market amongst other variables. The observed phenomenon hinted in the introduction, that long periods of weaknesses such as the Great Depression and the ‘lost decade’ in Japan are identified with the asset-price busts that preceded them, could therefore be no mere coincidence. The significant contraction in asset values, triggered a subsequent contraction in consumption and economic activity levels. Hence a large downfall in stock prices caused a similar decrease in economic activity.

#### **E. Studies investigating the relationship between Exchange Rate & Stock Market**

**Bhattacharya & Mukherjee (2002)** was conducted a study on “Causal Relationship Between Stock Market and Exchange Rate, Foreign Exchange Reserves and Value of Trade Balance: A Case Study for India.” This paper investigates the nature of the causal relationship between stock prices and macroeconomic aggregates in the foreign sector in India. By applying the techniques of unit-root tests, co-integration and the long-run Granger non-causality test, the study tests the causal relationships between the BSE Sensitive Index and the three macroeconomic variables, viz., exchange rate, foreign exchange reserves and value of trade balance using monthly data for the period 1990-91 to 2000-01. The results suggest that there is no causal linkage between stock prices and the three variables under consideration.

**Nath and Samanta (2003)** in a paper on “Relationship Between Exchange Rate and Stock Prices in India – An Empirical Analysis” empirically showed that generally returns in these two markets are not interrelated, though in recent years, the return in stock market had causal influence on return in exchange rate with possibility of mild influence in reverse direction. These results have opened up some interesting issues regarding the exchange rate and stock price causal relationship. In India, though stock market investment does not constitute a very significant portion of total household savings compared to other form of financial assets, it may have a significant impact on exchange rate movement as FII investment has played a dominant role. The results, however, are tentative and there is a need to undertake an in-depth research to address the issue.

**Kasman (2003)** in his paper on “The relationship Between Exchange Rates and stock prices: A



Causality Analysis” suggests that the macroeconomic variables move together in the long-run but variation in exchange rates do not cause a variation in three indices of the ISE. The results of this paper also indicate that change in exchange rate causes, in Granger sense, change in industry sector index.

**Tahir and Ghani (2003)** in a paper on “Relationship Between Exchange Rates and Stock Prices: Empirical Evidence from Bahrain’s Financial Markets: examined the relationship between stock prices and exchange rates in Bahrain using monthly data from January 1992 to October 2002. Co-integration and ECM models and Granger causality tests were used to determine the causal relationship between stock prices and exchange rates. The empirical results suggest long-run bidirectional causal relationship between stock prices and exchange rates (British Pound & Japanese Yen) and only uni-directional, from stock prices to exchange rate, causal relationship between them.

#### **F. Studies investigating the relationship between FII’s& Stock Market**

**Kohli (2001)** in her paper on “Capital Flows and their Macroeconomic Effects in India” attempts to analyse the patterns and trends in capital flows into India in the 1990s and how these have affected the key macroeconomic variables in the economy. It also attempts to study the response of the policy makers to the new challenges posed by the partial capital account liberalisation. The paper finds that an inflow of foreign capital during this period has resulted in real exchange rate appreciation and has had a significant impact on domestic money supply.

**Chakrabarti (2001)** found that the FII net inflows were not only correlated with the return in Indian equity market but was more likely the effect than the cause of the Indian equity market return. FIIs did not appear to be at an informational disadvantage compared to domestic investors in the Indian markets. Furthermore, the Asian crisis marked a regime shift. In the post-Asian crisis period, the return in the Indian equity market turned out to be the sole driver of the FII inflow, while for the pre-Asian crisis period, other covariates reflecting return in other competing markets were also correlated with FII net inflow.

**Mukherjee, Bose and Coondoo (2002)** explored the relationship of daily FII flows to the Indian equity market for the period January, 1999 to May, 2002 with two types of variables. The first type included variables reflecting daily market return and its volatility (representing risk) in domestic and international equity markets, based on the BSE Sensex, S&P 500 and the MSCI WI, as well as measures of co-movement of returns in these markets (the relevant betas). It is also seen that return from exchange rate variation and fundamentals of the Indian economy may have some influence on FII decisions, but such

influence does not seem to be strong, and finally, daily FII flows are highly autocorrelated and this autocorrelation cannot be accounted for by all or some of the covariates considered in the study.

**Kulwant Rai& N R Bhanumurthy (2003)** in their paper on “Determinants of Foreign Institutional Investment in India: The role of Return, Risk and Inflation” studies the determinants of Foreign Institutional Investments in India, which had crossed almost US\$ 12 billion by the end of 2002. In this study, by using monthly data, they found that FII inflow depends on stock market returns, inflation rate (both domestic and foreign) and ex-ante risk. In terms of magnitude, the impact of stock market returns and the ex-ante risk turned out to be major determinants of FII inflow. This study did not find any causation running from FII inflow to stock returns as it was found by some studies. Stabilizing the stock market volatility and minimizing the ex-ante risk would help in attracting more FII inflow that has positive impact on the real economy.

#### **G. Studies investigating the relationship between Interest Rates & Stock Market**

**Keungwong, Khan and Jun Du (2003)** in a paper on “Do Money and Interest Rates Matter for Stock Prices? An Econometric Study of Singapore and USA” examines the long-term as well as short-term equilibrium relationships between the major stock indices and selected macroeconomic variables (such as money supply and interest rate) of Singapore and the United States by employing the advanced time series analysis techniques that include cointegration, Johansen multivariate cointegrated system, fractional cointegration and Granger causality. The cointegration results based on data covering the period January 1982 to December 2002 suggest that Singapore’s stock prices generally display a long-run equilibrium relationship with interest rate and money supply (M1) but a similar relationship does not hold for the United States.

**Bernanke and Kuttner (2005)** on “What Explains the Stock Market’s Reaction to Federal Reserve Policy?” has documented a relatively strong and consistent response of the stock market to unexpected monetary policy actions, using Federal funds futures data to gauge policy expectations. We find that, on average, a hypothetical unanticipated 25-basis-point cut in the Federal funds rate target is associated with about a 1% increase in broad stock indexes. The result is robust to the exclusion of outliers and to the choice of windows for measuring the stock market’s response.

**Thorbecke (1997)** in a paper on “On Stock Market Returns and Monetary Policy” have addressed the question that whether monetary policy is neutral by examining how stock return data respond to monetary policy shocks. Theory posits that stock



prices equal the expected present value of future net cash flows. Thus, evidence that positive monetary shocks increase stock returns indicates that expansionary monetary policy exerts real effects by increasing future cash flows or by decreasing the discount factors at which those cash flows are capitalized. Using several measures of monetary policy and a variety of empirical techniques, this article presents evidence that monetary policy exerts large effects on ex-ante and ex-post stock returns.

**Adrienne, Kearney and Lombra (2004)** in a paper on "Stock Market Volatility, The News, And Monetary Policy" investigates the dynamic relationship linking the volatility of equity prices with "the news" and the expected path for monetary policy. Previous results that link the impact of the news about real activity to changes in current and future interest rates are employed in developing a positive link between changes in volatility and the news. Empirically, our results uncover a positive and statistically significant response of the Chicago Board Options Exchange (CBOE) volatility index, VIX, to unanticipated changes in employment, but not to inflation. Hence, agents' expectations for the policy response to news have an important influence on the expected volatility of stock prices.

#### **H. Studies investigating the relationship between Oil Prices & Stock Market**

**Jones and Kaul (1996)** in their paper on "Oil and the Stock Markets" test whether the reaction of international stock markets to oil shocks can be justified by current and future changes in real cash flows and/or changes in expected returns. They find that in the post-war period, the reaction of United States and Canadian stock prices to oil shocks can be completely accounted for by the impact of these shocks on real cash flows alone. In contrast, in both the United Kingdom and Japan, innovations in oil prices appear to cause larger changes in stock prices than can be justified by subsequent changes in real cash flows or by changing expected returns.

**Driesprong, Jacobsen and Maat (2004)** in a paper on "Stock Markets and Oil Prices" report evidence that investors in stock markets under react to oil price changes in the short run. As a consequence changes in oil prices predict future stock market returns: a rise in oil prices, lowers future stock market returns.

**Ravichandran & Alkhatlan (2010)** investigates the impact of oil prices on Gulf Cooperation Council (GCC) stock markets. Since GCC countries are major suppliers of oil, their stock markets are likely to be susceptible to change in oil prices. The results confirm that there is an influence of oil price change on GCC stock markets returns in the long-term. Long term is defined here as the period of time required for the effect of oil price changes to work out its way to influence major macroeconomic indicators that

influence profitability of firms traded in GCC stock markets.

**Ansar and Asghar (2013)** analysed the impact of oil prices on the Consumer Price Index (CPI) and Stock market (KSE-100 Index) in Pakistan for the period 2007 to 2012. To analyse the impact of the oil prices Johansen cointegration Test is used which indicate the positive relationship among oil price, CPI and KSE-100 Index, though the relationship is very strong relationship but it helps in concluding that oil prices have effect on CPI and KSE-100 Index.

### **5. FINDINGS**

Stock markets of emerging economies are prone to factors viz. changes in the level of economic activities, changes in the political and international economic environment and also related to the changes in other macroeconomic factors.

If stock prices reflect the underlying fundamentals, they are expected to be adopted as leading indicators of future economic activities. Hence, dynamic interactions and causal relations among stock prices and macroeconomic variables are imperative to the formulation of macroeconomic policy of a country.

If stock prices accurately reflect the underlying fundamentals, then the stock prices should be employed as leading indicators of future economic activities, and not the other way around. Therefore, the causal relations and dynamic interactions among macroeconomic variables and stock prices are imperative to the formulation of macroeconomic policy.

### **6. RESEARCH GAP**

All the research focuses only on the stock market of India which could be extended for other developing and developed countries too. Moreover, there could have a comparative analysis of Indian Stock Market and the stock markets of other countries.

All the studies only mention the impact macroeconomic variables on stock market as a whole in India. But no studies have been found on impact of macroeconomic variables on different sectoral indices in India.

### **7. CONCLUSION**

With the opening up of emerging economies and manifestation of liberalized policies during last few decades, stock markets of such economies are witnessed as volatile markets compared to their counterparts. Further, stock markets of emerging economies are prone to factors viz. changes in the level of economic activities, changes in the political



and international economic environment and also related to the changes in other macroeconomic factors. Generally, growth rate in gross domestic product; rate of inflation; rate of interest; fiscal position and exchange rate are considered as barometers of measuring the performance of the economy and are the major determinants of the growth of an economy.

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