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EFFECT OF MACROECONOMIC VARIABLES ON STOCK MARKET: A CONCEPTUAL STUDY

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Abstract

Aim:

Indian stock market has undergone incredible transforms since 1991, when the government has adopted liberalization and globalization policies. As a result, there is an increasing importance of the stock market from collective economy point of view. When we talk about economy then stock market has become a key driver of current market and is one of the major sources of raising resources for Indian company, thus enabling financial and economic growth. In fact, in the world, Indian stock market is one of the emerging markets.

The aim of this paper is to examine effect of macroeconomic variables on stock market. because wealth of the any economy is indicated by macroeconomic variables and they decide the future of investments. In any economy price determination process is influenced by the macroeconomic variables. The improbability of macroeconomic variables influences stock and commodity market significantly causing volatility in the prices. Stock Market is an important segment of the financial system of our country as it plays a vital role in channelizing savings from deficit sector to surplus sector.

Key Words: Macroeconomic Variables, Stock Prices, Government Policies, Employment Rate, and Inflation.

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Introduction

Indian stock market has undergone incredible transforms since 1991, when the government has adopted liberalization and globalization policies. As a result, there is an increasing importance of the stock market from collective economy point of view. Nowadays if we talk about economy then stock market has become a key driver of current market and is one of the major sources of raising resources for Indian company, thus enabling financial growth and economic growth. In fact, in the world Indian stock market is one of the emerging markets.

The capital market supports economic growth and success by providing an investment channel that adds to attract domestic and foreign capital. The combined performance of capital market can be easily seen by its indices that stand for the movement of stock prices being traded in capital market. As we know that the economic permanence in a country could be measured by macroeconomics variables. Inflation, interest rate, and exchange rate are some macroeconomics variables that reveal economic condition in India and the economic condition will influence the industry condition which eventually will affect the company activity that is why it is said macroeconomic variables are factors that could not be prohibited by the companies which might be affecting the instability of the stock price.

Macroeconomic variables indicate prosperity of any economy and they decide the destiny of investments. The macroeconomic variables influence price determination process in any economy. The uncertainty of macroeconomic variables affects stock and commodity market significantly causing volatility in the prices. Stock Market is an important segment of the financial system of our country as it plays a vital role in channelizing savings from deficit sector to surplus sector.

In the perspective of this effect in Indian Stock Market, the critical question is whether the decades old development or recent deprivation in the markets are in any way influenced by the domestic and international macroeconomic fundamentals. Agrawalla (2006) found that rising indices in the stock markets cannot be taken to be a leading indicator of the revival of the economy in India and vice-versa. However, Shah and Thomas (1997) supported this that stock prices are a small which reflect the real economy. Similarly results were found in Kanakaraj et

al. (2008). There are many other studies of share market returns and the macroeconomic variables and all studies provided different results related to their test and methodology.

Fama (1981) examined the relationship between macroeconomic variable and stock return and found the strong relationship between the real output and stock prices. Mukherjee and Naka (1995) also found that the Japanese stock market is cointegrated with these set of variables representing a long-run equilibrium relationship between the stock market return and the selected macroeconomic variables (inflation, money supply, the long-term government bond rate, call money rate, exchange rate, and industrial production index,).

Moreover, another study for Mookerjee and Yu (1997) found that both narrow and broad money supply affect the Singapore stock returns positively. Pethe and Karnik (2000) studied the inter-relationship between stock price and macroeconomic variables by applying an error correction model. Their study found that the state of economy and the prices on the stock market do not show signs of a long run relationship.

Ray and Vani (2003) studied the link between the stock market and real economic variables in the Indian stock market. The empirical results showed that, interest rate, industrial production, money supply, inflation rate and exchange rate are found to have significant effects on stock prices using a VAR model,.

In the past decades, many industry researchers, financial analysts and practitioners have attempted to forecast the relationship between stock markets movement and macroeconomic variables. They have conducted empirical studies to examine the effect of macroeconomic variables on stock price on or vice-versa or relationship between the two and the results of all those studies have given different conclusions according to the combination of variables, methodologies and tests used. Here, we are discussing some previous research works/papers and their empirical conclusions.

Objectives: To investigate the effect of selected Macroeconomics variables on stock Market.

LITERATURE REVIEW

Effect of Macroeconomic Variables on Stock Market:

In the past decades, many industry researchers, financial analysts and practitioners have attempted to forecast the relationship between stock markets movement and macroeconomic variables. They have conducted empirical studies to examine the effect of macroeconomic variables on stock price on or vice-versa or relationship between the two and the results of all those studies have given different conclusions according to the combination of variables, methodologies and tests used. Here, we are discussing some previous research works/papers and their empirical conclusions.

Darat and Mukherjee (1987) examined stock returns and selected macroeconomic variables of China, India, Brazil and Russia by applying a Vector Auto Regression (VAR) model and found that a there is significant causal relationship between them. The study used oil price, exchange rate, and moving average lags values as explanatory variables and MA (Moving Average) method with OLS (Ordinary Least Square) was applied. Insignificant results were found which postulate inefficiency in market. The study concluded that the domestic factors influenced more than external factors, i.e., exchange rate and oil prices, in emerging economies.

Bahmani and Sohrabian (1992) examined the relationship between stock market and effective exchange rate of currency in a short period of time in the USA (S&P 500 index, Dollar). The study recognized bidirectional causality between the two for the time period taken. However, the co-integration analysis when applied was not successful in establishing any long run relationship between the two variables.

Levine and Zervos (1996) studied the relationship of stock market development with economic growth. The study found a strong positive correlation between the stock market development, the long-run stock market index and the selected economic variables. Applying Vector Error Correction Model analysis the study found that the stock market was significantly influenced by lagged values of macroeconomic variables such as the consumer price index, the money supply and the Treasury bill rate.

Abdalla and Murinde (1997) analyzed the relationship between the exchange rates and the stock prices in the emerging financial markets of India, Korea, Pakistan and the Philippines. The study found that in Philippines, the stock price leads the exchange rate, wherein in the other sample countries there is unidirectional granger causality from exchange rates to stock prices.

Mookerjee and Yu (1997) investigated the long-term relationships between macroeconomic variables and stock market pricing, The study found that three out of the four macroeconomic variables were co-integrated with stock market prices. After applying Bi-variate co-integration and causality tests it was found that there is a significant interaction between money supply, foreign exchange reserves and stock prices for the case of Singapore.

Cheung Yin-Wong, and Ng Lilian K. (1998) examined International evidence on the stock market with aggregate economic activity Applying the Johansen co-integration technique, the study found long run co movements between five national stock and measured aggregate real activity covering the real oil price, real consumption, real money, and real output. The study found that the real returns on these indices were typically related to transitory deviations from the long run relationship and to changes in the macroeconomic variables.

Kwon and Shin (1999) studied the Korean stock market Engle-Granger with a set of macroeconomic variables by applying the co-integration and the Granger causality tests from the VECM. The study found that the Korean stock market was co-integrated. However, in the study they applied Granger-causality test and showed that the Korean stock index was not a leading indicator for macro-economic variables.

Ibrahim (1999) investigated the interactions between Industrial production index, CPI, money supply M1 and M2, foreign reserves, credit aggregates, exchange rate and KLSE Composite Index and found that selected macroeconomic variables are linked with stock exchange.

Pethe and Karnik (2000) investigated that how stock price indices were affected by crucial macroeconomic variables in India. The study analyzed five years Indian stock market data between April 1992 and December 1997. They also showed the weak causality running from IIP

to share price indices (i.e. Sensex and S&P CNX Nifty) but not the other way round was the outcome from this study.

Bhattacharya and Mukherjee (2002) studied the causal relationship between IIP, money supply, national income, interest rate, inflation rate and BSE Sensitive Index using monthly data between 1992 and 2000. Applying Unit–root tests, co-integration and the long–run Granger non–causality test recently proposed by Toda and Yamamoto (1995), the study's major findings suggested no causal linkage between stock prices and money supply, national income and interest rate where in it was found that the IIP leads the stock price, and there was a two- way causation between stock price and inflation rate.

Fifield S.G.M. et al. (2002) examined "Macroeconomic factors and share returns: an analysis using emerging market data" and found that emerging stock markets were affected by global level economic factors. Principal component analysis was applied considering GDP, Inflation, money and interest rates as economic factors and it was found that these factors suffice to characterize by world industrial production and world inflation. Regression analysis then used these components as inputs to explain the index returns of 13 ESMs between years 1987–96. This analysis showed that while the global factors were significant in explaining ESM returns, the local factors could also play a crucial role.

Ibrahim and Aziz (2003) examined the Malaysian market for relationship between stock prices and industrial production, money supply, consumer price index and exchange rate. The study found that Stock prices tend to share positive long run relationships with industrial production and CPI. On the contrary, stock prices showed negative association with money supply and exchange rate.

Islam (2003) studied the short-run dynamic adjustment and the long-run equilibrium relationships between interest rate, inflation rate, exchange rate, and the industrial productivity in the Kuala Lumpur Stock Exchange (KLSE) Composite Index. The study found that significant short run (dynamic) and long-run (equilibrium) relationships between the interest rate, inflation rate, exchange rate, and the industrial productivity and the KLSE stock returns.

Gan, Lee, Yong and Zhang (2006) analyzed the macroeconomics variables and stock market interaction: New Zealand Evidence. The study used set of seven macroeconomic variables and applied co-integration tests, the Johansen maximum likelihood and Granger-causality tests. The study also explored the short run dynamic linkages between NZSE40 and the interest rate, money supply and real GDP by using innovation accounting analyses and found in general that selected macroeconomic variables consistently determine NZSE40, but found no evidence to suggest New Zealand Stock Index as a leading indicator for changes in macroeconomic variables.

Patra and Poshakwale (2006) studied the short-run lively adjustments and the long-run equilibrium relationships between selected macroeconomic variables, trading volume and stock returns in the Greek stock market between 1990 and 1999. The study showed the existence of short run and long run equilibrium relationship between inflation, money supply and trading volume and the stock prices in the Athens stock exchange, where in no short run or long run equilibrium relationship was found between the exchange rates and stock prices.

Abugri (2006) explored to understand whether selected macroeconomic indicators like exchange rates, interest rates, industrial production and money supply in four Latin American countries significantly explained market returns. As per this study, the global factors were found consistently significant in explaining returns in all the markets. The market was found be to impacted by country's macroeconomic variables at varying significance and magnitudes.

Chuang et al. (2007) investigated if the money supply and budget deficit were significant and predicted stock prices in Taiwan, Hong Kong, Singapore and South Korea. Quarterly data on stock price indices, money supply and budget deficits was used for the study. The results found existence of a long-run balance relationship between money supply, budget deficit and stock prices for the four countries studied; and that stock prices do not necessarily adjust quickly and fully to the changes in either the fiscal or monetary policies, in the short run. Hence the results were found consistent with general economic literature on macroeconomics

Coleman and Tettey (2008) studied the impact of macroeconomic variables on Ghana Stock Exchange. Analysis performed using the quarterly data available between 1991 and 2005, suggested that stock market performance was adversely affected with the market lending rates charged by deposit money banks. Negative correlation between inflation and stock market performance was also suggested as a result of presence of a lag period.

Chen (2008) attempted to investigate whether the macroeconomic variables could predict recessions in the stock market. Empirical evidence from monthly data on the Standard and Poor's S&P 500 price index was analyzed and according to in-sample and out-of sample forecasting performance, the study concluded that among the macroeconomic variables considered, yield curve spreads and inflation rates were the most useful predictors of recessions in the U.S. stock market

Ahmed (2008) attempted to explore 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) which represented real and financial sectors of India. The author applied granger causality to explore the long-run relationships and BVAR modeling for variance decomposition and used impulse response functions to examine short run relationships. The study suggested that interest rates led stock prices in India which further excerpted overall economic activity. The study suggested that stock market is driven both by actual performance and by expected potential performances, which was not only the outcome of behavior of key macro economic variables but also one of the causes of movement in other macro dimensions in the economy.

Kumar (2008) attempted to find a long-term relationship between stock prices and exchange rate and inflation in Indian context. Applying empirical method and combining different statistical techniques, the study checked the presence of co-integration between the stock index (Sensex) and other variables by using past ten years of Indian economic data reflected through the wholesale price index and exchange rates. However he could not establish a causal relationship without the existence of co-integration between the selected macroeconomic variables

Singh, Dharmendra (2010) studied possible causal relations between stock market index i.e. BSE Sensex and three key macro economic variables by using correlation, unit root stationarity tests and Granger causality test. The findings showed that the stock market index, exchange rate, IIP and WPI contained a unit root and were integrated of order one. The Bilateral granger causality between IIP and Sensex while WPI showed strong correlation and unilateral causality with Sensex which suggested that the Indian stock market was tending towards informational efficiency at least on two macroeconomic variables, viz. exchange rate and inflation

Singh Tarika et al. (2010) explored the casual relationship between index returns and employment rate, exchange rate, GDP, Inflation and money supply for Taiwan. The study found that economists and finance specialists in Taiwan paid **i**ncreased attention to the relationship between share prices and the macroeconomic variables. The analysis was performed on stock portfolios rather than on single stocks. Four criteria were used in the construction of portfolio: Market capitalization, price/earnings ratio (P/E ratio), PBR and yield. The study attempted to establish a finer point with respect to the relationship between economic growth and stock market especially in terms of stock prices. Empirical findings from the study established that exchange rate and GDP seemed to influence returns of all portfolios, while inflation rate, exchange rate, and the money supply had negative relationship with returns for portfolios consisting of big and medium companies.

Tripathy (2011) analyzed the Indian stock market by using Ljung-Box Q test, Breusch-Godfrey LM test, Unit Root test, Granger Causality test and made an attempt to study the market efficiency and causal relationship between selected Macroeconomic variables. The study suggested that there is an autocorrelation in the Indian stock market and macro economic variables which implies that the market fell into form of Efficient Market Hypothesis. It was found that there is bidirectional relationship between stock market and interest rate and exchange rate, international stock market and BSE volume, exchange rate and BSE volume with the help of Granger-causality test. Also the findings suggested unidirectional causality running from international stock market to domestic stock market, interest rate, exchange rate and inflation rate indicating sizeable influence in the stock market movement.

Agrawal and Srivastava (2011) concluded existence of a positive significant relationship between volatility in stock returns and exchange rates and a also a bidirectional causality between exchange rate and stock market; and through the GARCH model. .

Dasgupta (2012) investigated to explore the long-run and short-run relationships between four key macroeconomic variables and BSE Sensex of Indian economy by using descriptive statistics, ADF tests, Johansen and Juselius's cointegration test and Granger causality test. The data for all the variables, i.e., WPI, IIP, EX, call money rate and BSE Sensex, was used on monthly basis. Results showed that all the variables has contained a unit root and are integrated of order one. Johansen and Juselius's cointegration test pointed out at least one cointegration vector and long-run relationships between BSE Sensex with index of industrial production and call money rate. Granger causality test was then employed. By the Granger causality test it was found that there no short-run unilateral or bilateral causal relationships between BSE Sensex with the macroeconomic variables. Therefore, it is concluded that, Indian stock markets had no informational efficiency.

Patel Samveg (2012) studied on the topic "The effect of Macroeconomic Determinants on the Performance of the Indian Stock Market" to investigate the effect of macroeconomic determinants on the performance of the Indian Stock Market with eight variables namely Interest Rate, Inflation, Exchange Rate, Index of Industrial Production, Money Supply, Gold Price, Silver Price & Oil Price, and two stock market indices namely Sensex and S&P CNX Nifty using monthly data over the period January 1991 to December 2011. The study found the long run relationship between macroeconomic variables and stock market indices. The study also revealed the causality run from exchange rate to stock market indices to IIP and Oil Price by applying Augmented Dickey Fuller Unit root test, Johansen Cointegration test, Granger Causality test and Vector Error Correction Model (VECM).

Bilal, Ahmad Raza at el, (2013) studied on the topic How Gold Prices Correspond to Stock Index: A Comparative Analysis of Karachi Stock Exchange and Bombay Stock Exchange. The objective was to examine the long run relationship between gold prices and Karachi Stock

Exchange (KSE) and Bombay Stock Exchange (BSE). Monthly data were used for the study and for measuring the long run relationship between gold prices in KSE and BSE duration was from 1st July 2005 to 30th June 2011. They used the Unit Root Augmented Dickey Fuller test, Phillips-Perron, Johnson Co-integration and Granger's Causality tests for analysis. No long-run relationship exist between monthly average gold prices and KSE stock index found by after applying the co-integration test showed that; whereas, a significant long-run relationship is proved between BSE stock index and average gold prices. The Results showed that there is no causal relationship exists among average gold prices, KSE and BSE stock indices by applying Granger causality test.

Kothari, S.P. et al (2013) studied on the topic "Aggregate Earnings Surprises and Inflation Forecasts" and found the aggregate earnings surprises enclose information about future inflation, but macroeconomic forecasters do not fully operate this information in generating their forecasts. Earnings news, aggregated across firms releasing earnings in a three-month period, predicts forecast errors in Producer Price Index (PPI) released in the subsequent two months. These aggregate earnings disclosures do not predict forecast errors for Consumer Price Index (CPI). The results are robust to alternative specifications, and they are driven by a broad cross-section of firms rather than limited to isolated industries like the financial services industry or the retail industry. With respect to the capital markets, the bond market's reaction to PPI news is predictable based on previously released aggregate earnings news. Collectively, the results indicate that neither macroeconomic forecasters nor bond market investors fully incorporate information in collective earnings surprises for future PPI.

Sangmi, . Mohi-u-Din et al (2013) studied on the topic "Macroeconomic Variables on Stock Market Interactions: The Indian Experience" to examine the effect of macroeconomic variables on the stock price movement in Indian Stock Market. They used selected macroeconomic variables inflation, exchange rate, Industrial production, Money Supply, Gold price, interest rate as independent variables. Sensex, Nifty and BSE 100 were indicated as dependent variable. The monthly time series data were gathered from RBI handbook over the period of April 2008 to June 2012. They used multiple regression analysis to construct a quantitative model showing the

relationship between macroeconomics and stock price. The result of this paper found that significant relationship is occurred between macroeconomics variables and stock price in India.

Rafay, Abdul et al. (2013) investigated on "Causal Relationship between Macroeconomic Variables: Evidence From Developing Economy" and found that **i**mportance of stock market in the economic development of a country cannot be denied, and macroeconomic variables are important indicators that affect stock market of a country. Present study provides a great contribution to understand the association of these variables with stock market. This paper was trying to check the causal relationship among interest rate, exchange rate, consumer price index, imports and exports and KSE 100 index. For this purpose nineteen years data has been collected from 1992 to 2010. Techniques of Augmented Dickey-Fuller test, regression analysis and Granger Causality test have been applied to examine the causal relationship of selected macroeconomic variables with KSE 100 index. Results of regression analysis indicate the presence of strong positive relation between IMP and KSEI.

Zaighum Isma (2014) investigated on Impact of Macroeconomic Factors on Non-financial firms' Stock Returns: Evidence from Sectorial Study of KSE-100 Index and found that for nine non-financial sectors listed in Karachi Stock Exchange, that there is a impact of pre-specified set of macroeconomic variables on firm's stock returns. The macroeconomic factors were included in the study were consumer price index, industrial production index, market returns, risk free return and money supply. The duration of the study was from 2001 to 2011. They found that all sectors' firm's stock returns have industrial production index and market returns indicates a positive relationship whereas negative relationship with consumer price index, money supply and risk free rate, after used panel analysis pooled OLS.

Umar Kibria et al (2014) studied on the topic, "The Impact of Macroeconomic Variables on Stock Market Returns: A Case of Pakistan. They considered five macroeconomic variables to find out the impact of these variable on KSE 100 index and they found that inflation, money supply, GDP per capita, GDP savings and Exchange rate has positive impact on KSE 100 index and for that they used descriptive analysis correlation analysis causality and regression analysis.

Dhaoui Abderrazak and Khraief Naceur (2014) studied on Empirical Linkage between Oil Price and Stock Market Returns and Volatility: Evidence from International Developed Markets studied that whether oil price impacting stock market returns or not. They found that there is a strong negative connection between oil price and stock market returns in selected seven countries after using monthly data for eight developed countries duration was from January 1991 to September 2013. Oil price changes were without significant effect on the stock market of Singapore. They found that the changes in oil prices are significant for six markets and they have not much effect on the others

Forson1, Joseph Ato and Janrattanagul Jakkaphong (2014) investigated on the topic "Selected Macroeconomic Variables and Stock Market Movements: Empirical evidence from Thailand" and examined the long-run equilibrium relationship between the selected macroeconomic variables and Thai stock Exchange Index (SETI) using monthly time series data from January 1990 to December 2009. Money supply (MS), the consumer price index (CPI), interest rate (IR) and the industrial production index (IP) (as a proxy for GDP) macroeconomic variables were included in analysis: They found that the SET Index and the selected macroeconomic variables are cointegrated and have a significant equilibrium relationship over the long run. Money supply demonstrates a strong positive relationship with the SET Index over the long run, whereas the industrial production index and consumer price index show negative long-run relationships with the SET Index.

Findings:

On the basis of review and analysis following are the findings:

1. Inflation, Market price, Industrial Production Price Index, Consumption Price Index, Money Supply, Treasury Bill, GDP and GDP savings have positive relationship with stock prices.
2. Inflation, Industrial Production Price Index, Consumption Price Index, Money Supply and GDP have high effect on the stock prices.
3. National Income has negative relationship with stock prices.
4. Consumption, oil prices, Exchange Rate and Interest rates have no significant impact on share price. So these factors do not have high effect on the stock prices.

Conclusion

A large number of previous studies indicated that there is a relationship between macroeconomic variables and stock market returns. Many macroeconomics variables were taken to analysis the effect and relationship between stock prices and macroeconomics i.e Inflation, Market price, Industrial Production Price Index, Consumption Price Index, Money Supply, Treasury Bill, GDP, GDP savings, National Income, Consumption, oil prices, Exchange Rate and Interest rates. Out of these only Inflation, Market price, Industrial Production Price Index, Change in risk, Yield Curve, Consumption Price Index, Money Supply, Treasury Bill, GDP and GDP savings have positive relationship with stock prices. And out of these Inflation, Industrial Production Price Index, Consumption Price Index, Money Supply and GDP have high effect on the stock prices. National Income has negative relationship with stock prices. Consumption, oil prices, Exchange Rate and Interest rates have no significant impact on share price. So these factors do not have high effect on the stock prices.

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