The Relationship between Macroeconomic Factors and Indian Stock Market

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Abstract
The main aim of the study to examine the impact of the macroeconomic variables i.e. inflation and exchange rate on the Indian stock market especially on National Stock Exchange (NSE) – Nifty 50 index, the data used for the period from 2010 to 2020 based on the secondary data collected from NSE official website to evaluate the relationship with inflation and exchange rate. Linear regression model was designed and used to evaluate whether independent variables i.e inflation, oil price and GDP growth rate has significant relationship on dependent variable stock market or not. The regression results of the study reveal that there is a statistical negative relationship between inflation and the Indian stock market and whereas, oil price and GDP growth rate has a statistically significant positive relationship on Indian stock market growth.
Keywords: NSE, Stock market, Microeconomic, Inflations, GDP, Oil price, returns

Introduction
It is very much important to understand the stock market performance and the factors which are influencing its performance. When it comes to factors which are influencing the stock market are classified into two categories like microeconomic and macroeconomic factors. Researchers across the world conducted research works to identify the relationship between these factors and stock market performance. But very few studies highlighted those micro factors and macro factors which are influencing directly on the performance of the stock market. (Yahyazadehfar et al, 2012) political instability of the country will not only impact on the inflation rate, interest rates and external reserves rates but also stock returns. (Chong et al, 2011) inflation rate has

significantly positive impact on stock returns. (Cutler et al., 1989) government decisions, policies and their managing election situation in the country will also impact on the stock price and on other hand few researchers highlighted the negative impact of the micro and macro factors on the performance of stock market. Performance of the stock market will not be affected by the non-economic activities (Pope et al, 1983). Kibria et al., (2014) conducted a similar study in Pakistan using the KSE index and inflation rate to check the relationship between each other and found that there is a positive relationship between Karachi Stock exchange index and inflation. Qamri et al., (2015) conducted a similar study related to the same stock exchange with 10 years past data and highlighted that there is no positive relationship between stock price and inflation. Even across the world various studies has been conducted to examine the relationship between stock price and inflation and highlighted the different results. With this background the current study has been conducted with three macroeconomic variables i.e. inflation rate , oil price changes rate and Gross Domestic Product(GDP) growth rate to examine the level of impact on the Indian stock market.

Literature Review
Kandir, (2008) conducted a study to evaluate the impact of the macroeconomic variables on the stock market returns in Turkey, for this purpose multiple regression models were designed by considering stock portfolio returns are used as dependent variables, while the macroeconomic variables are used as independent variables. Empirical findings reveal that exchange rate, interest rate and world market return seem to affect all of the portfolio returns, while inflation rate is significant for only three of the twelve portfolios. On the other hand, industrial production, money supply and oil prices do not appear to have any significant effect on stock returns. Significance of the exchange rate in Turkey is reasonable, since the volume of tourism activities and foreign trade has been steadily rising in recent years.

Benaković&Posedel, (2010) conducted a study to analyse the returns of the fourteen stocks of the Croation Capital market by using the macroeconomics factors like inflation, Oil price, interest rates, market index, and industrial production. They have highlighted that only Inflation rate has a negative relationship with returns of the stocks and whereas, inflation, oil price and interest rate have positive relationship with returns of stocks.

Singh et al., (2011) conducted a study in the Taiwan to highlight the macroeconomics factors impact on the stock market and findings of the study revealed that "exchange rate and GDP seem to affect returns of all portfolios, while inflation rate, exchange rate, and money supply were having negative relationship with returns for portfolios of big and medium companies".

Geetha et al., (2011) conducted a comparative study to evaluate the relationship between inflation and stock market by considering the three countries' evidence i.e China, US and Malaysia' stock market. Results of the study indicate that there exists a long run relationship

between inflation and stock market returns in all three countries but there is no short run relationship between these variables in Malaysia and US but in China there is an exception, in the short run there is good relationship between inflation and stock market returns. Therefore, in China both for the long run and short run there is a relationship between inflation and stock market returns. And their recommendation is to the Malaysia, US and China to revise and improve their monetary policy which is consistent with low inflation and inflation expectations and investors who are investing in these markets should be careful before taking decisions.

Kibria et al., (2014) conducted a study in Pakistan to examine the influence of the macroeconomic variables on the stock market, especially KSE (Karachi Stock Exchange). For the same purpose they have considered the KSE 100 index stocks returns as dependent variables and macroeconomic factors as independent variables and used the regression analysis to evaluate the relationship and impact of the macroeconomic variables like Exchange rate, GDP per capita, GDP savings, Inflation and Money supply. The results have proven that all independent variables have a statistically significant impact on the stock returns of the KSE 100 index.

After going through the above available previous literature with respect to the effect of the macroeconomic factors on the stock market, it was evident that very few studies have been conducted on Indian stock market especially with the National Stock Market (NSE) by considering the independent variables like the inflation, GDP, Oil price changes rate. Therefore, the present study has taken up to examine the relationship between the independent variables and dependent variables.

Objectives of the study

The main purpose of the study is to evaluate the relationship between the inflation and exchange rate with Indian stock market, especially with the National Stock Exchange (NSE). And also to examine whether there is a significant effect on the stock market returns from inflation rate and exchange rate.

Hypothesis of the study:

Hypothesis 1:

H_0: there is positive relationship between macroeconomic variables and stock market returns

H_1: there is positive relationship between macroeconomic variables and stock market returns

Hypothesis 2:

H_0: there is no significant impact of macroeconomic variables on the stock market

H_1: There is a significant impact of macroeconomic variables on the stock market

Research Methodology

To examine the impact of the inflation rate of a country on the stock price, last 10 years data has been collected from the National Stock Exchange website about the Nifty 50 index as it is one of the important indexes of the Indian stock market. Nifty 50 indexes is the index of the National Stock Exchange of India and close price of the Nifty 50 index has been considered from NSE official website and also historical data sets of the inflation rate of India and exchange rate were

collected from secondary sources. The regression and correlation analysis has been used to analyse the data with help of the SPSS 21 version, in order to show the past trends of Nifty 50 index.

Model,

Stock Price = $\beta 0 + \beta_1$ Inflation Rate $+ \beta_2$ Exchange Rate $+ \mu i$

Data analysis & Interpretation

Figure 1: Nifty 50 index Trend
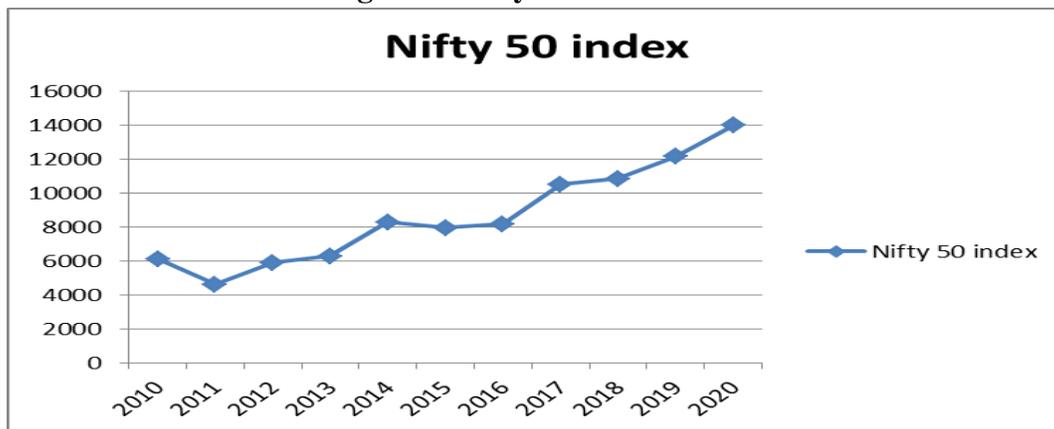
Source: Compelled by the researchers with secondary data

The above figure no 1 reveals trends of the National Stock Exchange – Nifty 50 index and this index is the one of the important index which indicates the country's economy along with another index namely BSE – Sensex Index. Nifty 50 index has reached the Rs.14000 crores mark in the year 2020 and it great achievement in the last ten year as compare to 2011 where Nifty 50 index was at Rs.4623.3.

Figure 2: Inflation Rate, oil price & Gap Rate Trend
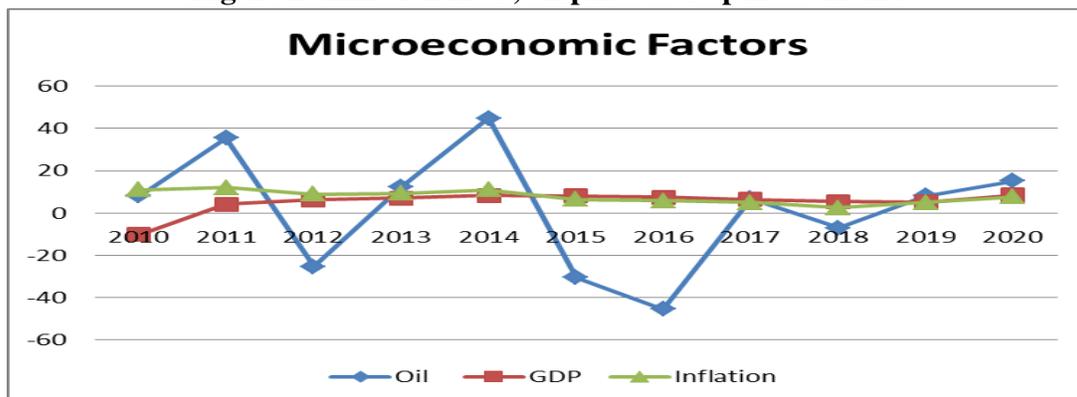
Source: Compelled by the researchers with secondary data

Total 11 years Inflation rate, oil price changes rate, GDP growth rate has been collected presented in the above figure 2 and it reveals the data set of the Gross Domestic Product growth

rate of the country is totally volatility in nature and even oil price change rate is also having very much volatility in nature. As inflation rate is an independent variable in the above figure and illustrates the past patterns from 2010 to 2020. It's evident from the above figure in the previous 11 years, patterns are very much frustrating. In the year 2018, inflation rate was very much low as compared to previous year i.e is 2.5 percent. In the year 2014 inflation rate was 11 percent and started declining and it reached lowest rate 2.5 percent in the year 2018. From 2019 inflation rate is increasing and it has reached to 7.90 percent and in the year 2020 it came down to 5.88 percent.

Table 1: Descriptive Statistics

Variables	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Inflation	11	7.6480	3.01150	-.133	.661	-.998	1.279
Oil	11	2.0436	27.33939	-.267	.661	-.413	1.279
GDP	11	5.1200	5.28484	-2.929	.661	9.133	1.279
NSE	11	3.9145	.14922	.019	.661	-.906	1.279

Table 2: Regression analysis for the independent variables on Stock market growth

Independent variables	Constant	Regression coefficient	SE	t-value	R^2	F
Inflation	4.24	-.045	.013	-3.394	.668	4.688
Oil	4.24	.002	.001	1.749		
GDP	4.24	.003	.007	.399		

** Significant at 0.01 level

Perusal of above table 2 shows linear regression analysis for the independent variables on stock market growth. The results show the contribution as:

Stock Market = 4.24, -0.045 (Inflation), +.002 (Oil), +.003(GDP)

The regression coefficient for inflation rate (-0.045) results reveals that there is no significant relationship between the independent variable and dependent variables. Whereas, GDP growth rate (+.003) and Oil (+.002) results reveal that it has maximum contribution on stock market growth, the regression co-efficient is significant at 0.01 level.

The R2 value of regression co-efficient is .668, which is highly significant at 0.01 level. This supports the assumption that the combined contribution of the independent variables for dependent variables is significant and they substantially affect stock market growth. Therefore we can reject the null hypothesis and accept the alternative hypothesis (hypothesis – 2 framed at the beginning), there is a significant impact of macroeconomic variables on the stock market.

Conclusion

The present study reflects the relationship between the macroeconomic variables and dependent variable – stock market i.e. NSE - Nifty 50 index. Among three macroeconomic variables, the inflation rate has a negative relationship towards the stock market and the remaining two factors Oil price change rate and GDP growth rate, have a positive impact on the stock market. This is an evident result that macroeconomic factors collectively affect the growth of the Indian stock market. Therefore, investors have to read the reports related to the microeconomics factors and do some research by observing the patterns of the trends and should take effective decisions before they invest in the stock market. No matter what the impact which macroeconomic variables can cause on the stock market whether it is negative or positive, one can't ignore and proceed with their investment in the stock market. As the present study is limited with only three macroeconomic variables, there is a scope for the further research to conduct in this area by considering other independent variables of macroeconomics which will contribute to growth of the Indian stock market.

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Data Sources:

- Historical inflation data: https://www.inflation.eu
- Historical Oil price & GDP growth rate data: https://www.macrotrends.net
- National Stock Exchange data: https://finance.yahoo.com