Impact of Macroeconomic Variables on BSE Sensex

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ABSTRACT - Stock Market plays significant role in the economy. It also reflects the wellbeing of nation as well as sound financial market. While investing in any stock they take into considered the financial indicators like Return on Equity, Return on Assets, Economic Value Added etc., Apart from that economic indicators like interest rate, inflation rate, unemployment, budget, Gross Domestic Price Index, Consumer Price Index are also important for measuring the growth of economy. Stock market is always considered as path to earn money easily specially in Indian Scenario. But through the awareness nowadays they start to think various factors which directly or indirectly affect the share prices and now they consider stock market as a medium of investment. This study discloses the relationship of selected macro-economic variables and their impact on stock market. The time period of the study is from 2011 to 2020 on yearly basis data. For testing the hypotheses correlation, regression and ANOVA have been taken by the researchers. The study reveals that there is a long-term relationship exists between the selected macroeconomic variables and SENSEX. The outcomes demonstrate that GDP and Inflation rate significantly effect on Sensex.

Key Words: Macroeconomic, GDP, Inflation, Sensex

I. INTRODUCTION

The world is active and so also its elements. In this technological era the information broadcasting has become massive faster. Stock market is always considered as path to earn money easily specially in Indian Scenario. But through the awareness nowadays they start to think various factors which directly or indirectly affect the share prices and now they consider stock market as a medium of investment. Indian stock market plays an important role in financial system. It provides platform for wealth creation. They consider as a barometer of any economy. They also represent sentiment in the market. Since 1980 it has been well established theory that claims the impact of microeconomic indicators on stock market. In last two decades many researchers and academicians conducted the research on relationship between these variables and stock market. Due to using different approaches the casual relationship between indicators and index might not hold same. However, the role of these economic indicators has been studied less in India. So, in this study the researcher shall take the selected macroeconomic indicators and want to know,

- Do the selected macroeconomic indicators influence SENSEX?
- Is there any causal relationship among these variables?
- Which indicator out of two plays a crucial role while selecting stock for investment?

Review of Research and Development in the Subject:

In past many researchers and financial analysts have conducted the research to measure the impact of macroeconomic indicators on stock market at national and international level. Here the researcher discusses some previous research related to study.

International Status:

- Xqiu Zhao (1999) conducted study to document the relationship among inflation, output and stock price in the Chinese stock market. His study revealed that there is a positive relation between stock returns and unexpected output growth but stock returns and expected output growth have negative association. Moreover, outcomes show that there is a negative relationship between stock price and inflation.
- Anthony Kyereboah- Coleman, Kwame F. Agyire-Tetty (2008), in their research paper studied how macroeconomic indicators affect the performance of stock market by using case study of Ghana Stock Exchange. They took timeseries data covering 15 years (1991-2005) and analyzed them using cointegration and error correlation model technique. The result reveals that lending rates from deposit money banks have an adverse effect on stock market performance while inflation rate is also found to have negative effect on stock market performance.

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- Donatar Pilinkus (2010) studied the short- and long-term relationship between macroeconomic indicators and stock market. His study was investigated on ten selected macroeconomic indicators and its impact on Baltic stock market indices. The data was covered for 8 years. Lithuania, Latvia and Estonia were selected for collection of data. Vector autoregression and Johansen multiple cointegration test were used to find out short- and long-term relationship. The result indicates that the relation of macroeconomic indictor and stock market indices is reliable in long run so investor should pay attention while choosing scrips for investment.
- Joseph Tagne Tall (2013) has taken monthly data for the period of 1993 to 2012 to examine the influence of macroeconomic factors on stock market in Stockholm Stock Exchange. Four independent variables like exchange rate, Consumer Price Index, money supply and interest rate were taken as independent variables. Multivariate Regression Model, Unit root test and Granger Causality test were used to analyze the relationship. The results shows that both currency depreciation and inflation have shown negative impact on stock market. Interest rate is not shown any significant impact on share prices. It was also found no unidirectional is found between the macroeconomic factors and stock market returns.

National Status

- Harpreet Kaur, Dr. Jagdip Singh and Nitu Gupta (2016) in their study have drawn the attention on various factors which impact on stock market. In their paper an attempt was being made to review the literature on macro-economic variables on stock market. After reviewed around 190 published paper they gave their suggestion for the gap and further research in it.
- Giri A.K. Joshi Pooja (2017) in their work examined the long run and short run relationship between stock price and set of macroeconomic variables by taking annual data from 1979 to 2014. They used VECM method to test causality and variance composition was used to predict long run relationship. Their result indicates that unidirectional causality running from economic growth and FDI to stock price in India.
- Parab Nayan and Y.V. Ressy (2018) in their study examined the impact of traditional and modern performance measures on stock returns. They took 408 companies from Nifty 500 index for period 2002 to 2017 and further sorted to 18 sectors in India. With using Panel Data analysis (CREM and FEM model), correlation and Unit Root test, they analyzed low negative relationship of EVA, ROA, ROE and ROI with stock returns. Moreover, they suggested that the impact of modern performance measures have been more on stock returns than traditional measures.
- Keshav Garg and Rosy Kalra (2018) conducted the study to find out the impact of macroeconomic factors on Indian stock market. They used descriptive methodology. They have taken senses as a dependent variable and GDP, exchange rare, unemployment rate, foreign exchange rate, Gold Prices, average inflation rate as independent variables. With using Pearson correlation, the study reveals that there is a positive relationship between the Sensex and macroeconomic factors except inflation and unemployment rate.

SIGNIFICANCE OF THE STUDY

The present study aims to identify the overall impact of selected macroeconomic variables on stock market during last 10 years. It gives understanding of practical approach. It will also exposed the route to make addition towards the available works. It throws the light on how these variables effect on SENSEX. The study will be useful for government and RBI for fiscal policy and monetary policy. Stock Market itself is one of the major indicators of any economy. Through the trends of stock market laymen can also see the growth of an economy. Therefore, it will also be important for policy makers to assist with development of economic policies for the economic growth. The study will facilitate to actual investors as well as potential investors for buying and selling decision of securities.

OBJECTIVES:

Research objectives help to know the path for finding the solution for problems mentioned in the statement of the problem.

- To measure effect of macroeconomic indicators on BSE Sensex.
- To know out causal relationship if any between Sensex and economic indicators.
- To compare the impact of selected macroeconomic variables on Sensex.

II. METHODOLOGY

Design and Type of Research

In this study the researchers are using Quantitative research which is a structured path for collecting and analyzed the data. Here they have used BSE Sensex which is the most popular index used for benchmark. Sensex is an index of 30 well established companies listed on Bombay Stock Exchange based on free float market capitalization. This index is the flagship index for the economy. It reflects true reflection of variables on stock market. Moreover, two macroeconomic indicators Gross Domestic Product (GDP) and inflation rate are selected to find out the impact on stock market. The study is covered over the time period for Jan.2010 to Dec.2020 It is data-based work, coming up with conclusion which also called Empirical research.

Variables Selected

Dependent Variable

- Sensex

Independent Variables

- Gross Domestic Product
- Inflation Rate

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Data:

The study is based on secondary data. To fulfil the set objectives of this proposed research secondary data has been obtained from all possible sources. The secondary data was taken from respected websites of BSE, World Bank and Reserve Bank of India for 10 years. Moreover, the published literature informs of books, journals, magazines, newspapers have been used to compile study. Classification and tabulation of data have been done by the researcher as per necessities of the study.

Sampling:

The present study is carried out on micro level. Convenience sampling method has been used by the researchers. For the study sample is consisted 30 companies of BSE Sensex and selected two microeconomic indicators. The population of present study are all companies registered on BSE. There are more than 4500 companies listed on BSE. It has not been possible for the researchers to conduct census study. The study has been covered over 10 years (01/01/2010 to 31/12/2020) of time period.

Hypotheses of the Study:

The following hypotheses are framed by the researchers for this study.

H01: There is no significant difference between GDP and Inflation rate

H02: There is no significant difference between GDP and Sensex

H03: There is no significant difference between Inflation rate and Sensex

Statistical Tools & Techniques:

Descriptive statistics is used for showing pattern and trends of selected data. It helps to describe the past behavior of selected variables and also suggests future aspect for selected data. The researchers use descriptive statistics like average, standard deviation, coefficient of determination. To test the hypotheses researchers frames the regression model. Moreover, formal investigation has been be carried out by using ANOVA to test hypotheses which is allowed to make conclusion. Researchers also have used 5% level of significance to test the hypotheses and testing is done by using SPSS software.

Interpretation:

TABLE 1 MACROECONOMIC VARIABLES

YEAR	GDP	INFLATION RATE	SENSEX
2011	5.24	8.86	15454.92
2012	5.46	9.31	19426.71
2013	6.39	11.06	21170.68
2014	7.41	6.65	27499.42
2015	8	4.91	26117.54
2016	8.26	4.95	26626.46
2017	6.8	3.33	34056.83
2018	6.53	3.95	36068.33
2019	4.04	3.72	41253.74
2020	-7.25	6.62	47751.33

Source: World Bank and BSE India

Table 1 shows that there is increasing trend in GDP till the year 2016. However, after announcing demonetization of the 500- and 100-rupees notes, the growth of economy slowed down. Many suggested that demonetization was the reason behind the drastic fall in economic growth. With demonetization newly enforced Goods and Service Tax also affected the industries. In the year 2013 India's benchmark inflation rate recorded high due to facing dilemma of raising interest rate. Sensex was to touch 47000 in the year 2020. Generally GDP increase over time for two reasons production of most goods increases by time and similarly the price of goods also increase.

Carstrom (2002) analysed that GDP and stock prices are inter related. According to his research the stock prices change, no matter what the source is. It directly affects the cost of borrowing, when borrow money becomes costly, firms borrow and invest less. Changes in information about the future GDP also cause the price change in stock market.

Inflation emerges due to decrease in aggregate supply. It increases the costs and the resulting inflation is known as cost push inflation when there is inflation most prices are rising. It is a common belief that inflation is advantageous for stock market some people argued in favor because the inflation increases the return to shareholders.

H01: There is no significant different between Inflation rate and Sensex

Table 2 Model Summary

REGRESSION STATISTICS

MULTIPLE R	0.088303911
R SQUARE	0.007797581
ADJUSTED R SQUARE	-0.116227722
STANDARD ERROR	4.778713659
OBSERVATIONS	10

Source: Researchers' calculation

Table 3 ANOVA

	DF	SS	MS	F	SIGNIFICANCE F
REGRESSION	1	1.435726114	1.435726	0.062871	0.808334379
RESIDUAL	8	182.6888339	22.8361		
TOTAL	**9**	**184.12456**			

Source: Researchers' calculation

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Table 4 Analysis on Significant relationship between GDP & Inflation

C	COEFFICIENTS	STANDARD ERROR	T STAT	P-VALUE
INTERCEPT	6.042691688	4.096408475	1.475119	0.178416
X VARIABLE 1	-0.15067735	0.600929025	-0.25074	0.808334

Source: Researchers' calculation

Here in above table, we can see that calculate value of F is 0.0628 which is less than critical value of F. Similarly, p value is also more than stated value 0.05. Therefore, it is clearly proved that the null hypothesis is accepted. There is not a significant relationship exist between these two macroeconomic variables.

H02: There is no significant different between Gross Domestic Product and Sensex

Table 5 Model Summary

REGRESSION STATISTICS	
MULTIPLE R	0.630712892
R SQUARE	0.397798752
ADJUSTED R SQUARE	0.322523596
STANDARD ERROR	3.722902763
OBSERVATIONS	10

Source: Researchers calculation

The table shows that the model summary which is used by the researchers to determine how a regression model fits the data. In the table R represents the value of multiple correlation coefficient. It is clearly seen from the table that independent variable GDP shows 39.7% of variability of dependent variable Sensex. Standard error of the model is 3.72 which is used to get confidence value of F.

Table 6 ANOVA

	DF	SS	MS	F	SIGNIFICANCE F
REGRESSION	1	73.24452015	73.24452	5.284596	0.050563505
RESIDUAL	8	110.8800399	13.86		
TOTAL	**9**	**184.12456**			

Source: Researchers' calculation

Table 7 Analysis on Significant relationship between GDP & Inflation

	COEFFICIENTS	STANDARD ERROR	T STAT	P-VALUE
INTERCEPT	13.39233112	3.79942251	3.524833	0.007791
X VARIABLE 1	-0.000281097	0.000122279	-2.29882	0.050564

Source: Researchers' calculation

From the above table it is clearly seen that calculated value of F is more than the critical value. Meanwhile the analysis of t test divulges that the p value is than 0.05. This means null hypothesis is rejected and concluded that there is significant relationship exist between inflation rate and Sensex during the study period.

Table 8 Model Summary

REGRESSION STATISTICS	
MULTIPLE R	0.625787735
R SQUARE	0.39161029
ADJUSTED R SQUARE	0.315561576
STANDARD ERROR	2.192975419
OBSERVATIONS	10

Source: Researchers' calculation

Table 9 ANOVA

	DF	SS	MS	F	SIGNIFICANCE F
REGRESSION	1	24.76451051	24.76451	5.149466	0.052952914
RESIDUAL	8	38.47312949	4.809141		
TOTAL	**9**	**63.23764**			

Source: Researchers' calculation

Table 10 Analysis on Significant relationship between Inflation & Sensex

	COEFFICIENTS	STANDARD ERROR	T STAT	P-VALUE
INTERCEPT	11.16471933	2.238049366	4.988594	0.001068
X VARIABLE 1	-0.000163449	7.20281E-05	-2.26924	0.052953

Source: Researchers' calculation

As per above that, we can see that calculated value of F is greater than critical value. Anova table shows that the independent variable GDP statistically significantly predict the dependent variable (1,8) = 5.284, P (0.0505) <0.05. Thus, the null hypothesis is rejected. There is a significant relationship between inflation rate and Sensex.

LIMITATION OF THE STUDY:

- The study is based on secondary data only.
- The study is covered only one index Sensex.
- The study is focused on two economic indicators only which will completely not represent all the macroeconomic indicators.

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- The time span of the study is covered only 10 years to examine the relationship between the selected indicators and selected indices

III. FINDINGS

From the above analysis researchers concludes that there is no significant relation between Sensex and inflation rate. There is no noted correlation between GDP and Inflation rate. Moreover, the findings suggest that GDP is the most important variable influencing stock prices. The correlation between Sensex and GDP is positive that meant both moves in same direction. Similarly, the relationship between the Sensex and inflation rate also positive. It shows positive movement in both variable. Inflation rate also shows the significant impact on Sensex. In the year 2020 due to lockdown many industries were seriously affected. Workers were suffered due to pandemic. Income level of people was also affected due to unemployment resulted less demand for goods and services except primary goods. Hence the growth rate suffered very badly which we clearly seen from negative GDP in the year 2020. The government took the several measures to improve the GDP by giving relief packages.

IV. CONCLUSION

The main purpose of the research is to identify the impact of selected macroeconomic variables on Sensex. Apart from selected variables other macroeconomic variables should also be considered while investing in stock market. These factors play vital role in the market that will have effect in long run. Before pandemic inflation was under control so there was a surge in stock market. During pandemic there was fear among the investors that was resulted in set off the securities. During the Jan. 2020 to June 2020 Sensex was negatively affected by Covid 19.

Investor's sentiments are always boosted on expectation that the GDP likely will touch a record high. Besides it, investment facilitation is also increased foreign inflows into country. However, rise of Sensex is not always true reflection of economy. FDIs plays significant role in it. If they decide to shift their investment to more profitable project elsewhere the bubble will be burst. Policy makers need to make strategies that complement with macroeconomic indicators framework and also supports the stock market.

REFERNCES

[1] Adam, Anokye M. and Tweneboah, George (2008). Macroeconomic Factors and Stock Market Movement: Evidence from Ghana.

[2] Alam, M. M., & Uddin, M. G. S. (2009). Relationship between interest rate and stock price: empirical evidence from developed and developing countries. International journal of business and management, Vol. 4(3), pp. 43-51.

[3] Bhargava, A. (2014). Firms' fundamentals, macroeconomic variables and quarterly stock prices in the US, Journal of Econometrics. 183(2), pp. 241-250.

[4] Chen, N. F., Roll, R. and Ross, S.A. (1986). Economic forces and the stock market. Journal of Business, Vol. 59(3), pp. 383-403

[5] Hridanshu Damani, Mridushi Damani. (2020). Macro-Economic Variables & its Impact on Stock Market Prices. International Journal of Advanced Science and Technology, 29(5s), 2553-2568

[6] Pethe, A., Karnik, A. (2000), Do Indian stock markets matter? Stock market indices and macro-economic variables. Economic and Political Weekly, 35, 349-356

[7] Prabakaran, V. (2014). Dynamic Interactions of Macroeconomic Variables and Stock Market Movements in India. Global Management Review, 8(4).

[8] Srinivasan, P. (2011). Causal nexus between stock market return and selected macroeconomic variables in India: Evidence from the National Stock Exchange (NSE). IUP Journal of Financial Risk Management, 8(4), 7.

[9] Tripathi, R., Singh, A. B., & Singh, P. T. (2016). Impact of Key Macroeconomic Variables on Movement of the Indian Stock Market with Reference to BSE Sensex. Indian Journal of Finance, 10(6), 38- 50.

 DOI : 10.35291/2454-9150.2021.0544