

# Impact of Macroeconomic Variables on Stock Market -A Study Between India And America

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## *Abstract*

*In many nations, stock markets are now an important and inextricable part of the economy. It is among the metrics that demonstrates the importance of the stock market in a nation in assessing the wellbeing of the country's economy as well as having an effect on the success of the financial market. Overall macroeconomics plays an important role in building national economies. This study considers the selected macroeconomic variables and their impact on stock market of both the countries India and America and their interrelationships. To estimate the association, relationship, individual significant relationship and interrelationship correlation, regression, t-test and ANNOVA model have been taken into consideration. The duration of the study is from 2015 to 2019 on the basis of yearly data from World Bank. As per the analysis, it is found that Inflation rate and Interest rate are insignificantly affecting the BSE SENSEX but GDP and GDP PER CAPITA are statistically significant. Whereas DOW JHONES is not meaningfully affected by all the macroeconomic variables as all are statistically insignificant. However, in case of individual relationship between macroeconomic variables and stock market of both the countries, all the macroeconomic variables are statistically significant.*

**Key Words:** *Macroeconomic, GDP, Interest rate, Inflation, SENSEX, DOW JHONES*

## **1. Introduction**

In several nations, including India, the financial markets have become an important and inextricable component of the ecosystems. It is the reality that indices of stock market are one of the metrics for assessing the health of the country's economy shows that the stock market in a country is most relevant. Mankiw (2010:264) mentioned that the stock market is reflecting expectations about economic conditions in the future because the stock market is showing the willingness of investors to buy at a high price level withholding the assumption of profitability of companies. The rise in stock prices indicates that investors expect the economy to grow rapidly; a decrease in stock prices suggest that investors expect an economic slowdown. It is the cause of recession around the corner that stock market is experiencing and reflect the significant downturn (Mankiw, 2010:534). Thus, the government needs to pay attention to measuring the efficiency of the stock market and even interfere if it is necessary. Considering the present theoretical perspective, it is the argument that macroeconomic factors influence the stock market and since the 1980s, persistently a topic of keen concern amid economists, investors and regulators of the stock market. Researchers have expanded attempts over the past couple of decades to determine this correlation scientifically (Chen et al. (1986), Taylor (1992), Fama (1990,1991), Pearce & Roley (1988) considering the rate of outputs, efficiency, growth rate of GDP, Rate of employment, yield spread, rate of interest, inflationary conditions, dividend return, and so on, was pretended by interrelationship of commercial action and asset prices. More significantly, the relationship between the stock market and fundamental economic indicators has attracted growing attention from developing and emerging economies (Mukherjee and Naka (1995), Maysami et al. (2004), Ratanapakorn and Sharma (2007), Rahman et al. (2009) The study shows that the association between the stock market and macroeconomic variables exists, but the findings and the conclusions will vary with experiments when using the various approaches. The outcomes may be different. However, if comparisons are made between two countries, such as India and America, the importance of macroeconomic variables in stock markets is comparatively less explored.

## **2. Literature Review**

A significant field of study discussed by various scholars at national and international level is the interaction among macroeconomic factors and the stock market.

**Darat and Mukherjee (1987)** found in BRICS nations returns of stock do influenced by the macroeconomic determinants there by explaining the rapport. He used VAR Model where lag values of explanatory variables were considered in the study.

**Choi, et al (1999)** studied the correlation between growth rates in industrial output and stock market performance of the G-7 countries. The experiments revealed that in long term the relationship between current market price and industrial output log levels are in equilibrium.

**Pethe and Karnik (2000)** studied the interrelationship between selected macro-economic variables and stock market behaviour. It was concluded by them that the evidence regarding effect between macro variables and stock indexes is not sufficient and therefore the long-term relationship between stock prices and exchange rates, prime loan rates, narrow supply of capital, wide flow of money and the industrial production index are not consistent.

**Panda and Kamaiah (2001)** In the post-liberalization context, the causal links and complex relationships between stock market return, rate of inflation, real activity and monetary policy,

were examined. They found that monetary policy, projected inflation and real activity influences the stock return, however as projected growth and actual activity are placed into the scheme, monetary policy lacks its explanatory capacity for asset returns.

**Dimson et al. (2002)** has examined whether countries with high GDP growth in the long period also had superior stock market performance in a long period. The result was surprising and opposing the prospects that while taking different countries to study their correlation between economic growth and stock return will be negative.

**Nishat (2004)** Assessed the long-term relationship between macroeconomic factors and stock prices and explanatory factors like money supply, consumer price index (CPI), IPI, and foreign exchange rate were used and employed. The study indicated that there are causal links between the price of stocks and macroeconomics.

**Sarkar (2005)** used the annual data of variables like real and nominal share price, Turnover ratio of stock market, number of firms listed in stock exchange, capital formation, industrial output and real GDP growth rate to find out the relationship between capital accumulation and economic growth. They found no positive relationship during the study period.

**Prabakaran, V. (2014)** Deliberated the effect on the stock market of variables like gold rate, value of debt traded, rate of exchange and oil prices. The study showed the Indian stock market is significantly affected by the exchange rates and oil prices.

**Siddiqui, S., & Seth, N. (2015)** investigated that whether the Indian stock market returns are influenced by changes in the global oil price. The result revealed that there is a negative average return on stocks, while there is a higher average return on crude oil prices.

**Ramadan et al. (2016)** Attempted to expound the connection between macroeconomic determinants and stock market for the period from January 1998 to January 2014, in two developing economies i.e., Egypt and Tunisia. The findings show that there is a causal link between the price index and CPI, the exchange rate, the availability of capital and the rate of interest in Egypt.

**Hridanshu Damani, Mridushi Damani. (2020)** studied the macroeconomic impact on BSE S and P 500 from the period 2016 to 2019. They found the significant relationship of some macroeconomic indicators with S and P 500 while some others are insignificant.

### **3. Research Methodology**

Economic variables like Interest rate and inflation rate, GDP, GDP PER CAPITA are taken in to consideration in this study. All these macroeconomic variables impact on Indian stock market and American stock market are measured by applying correlation and regression analysis. BSE SENSEX and DOW JHONS are taken as proxy of stock market performance in both the countries. Yearly market capitalization is taken in to account for measuring the market performance. Inflation, Interest rate, GDP, GDP PER CAPITA are also interpreted on the basis of yearly data provided by World Bank and Yahoo Finance. Apart from that various journals, articles, blogs, and economic websites also followed for deriving concurrent evidences and previous works on the present study. The current study is using simple linear techniques. The use of this model is due to find out the relation between dependent variable (SENSEX) and independent variable (macro-factors).

#### **4. Importance of the study**

This study will open the path to make new addition towards the available literature. The present study aims to analyse the overall impact of macroeconomic factors on stock markets of both India and America during the study period 2015-2019. This study will help the policymakers in macroeconomic policy formulation and implementation, help the investors to accommodate with the changing face of macroeconomic dynamism and taking effective investment decisions and finally put light on how the macroeconomic factors are putting impact the stock markets of both the country, India and America.

#### **5. Objectives of the study**

- A. To know the relation among macroeconomic factors and stock market.
- B. To find out significant relation of stock market with the selected macroeconomic variables.
- C. To compare the impact of macroeconomic variables on stock market of India and America.
- D. To see the interrelationship of macroeconomic factors between the two nations.

#### **6. Scope and Limitation**

This study only considers five years data. As the macroeconomic variables are very dynamic in nature, studies must have been made on focusing monthly, quarterly, or half yearly as well as more than five years data. This study only considers selected macroeconomic variables. Further study can be made on other macroeconomic factors and their impact on stock market between India and America. Similarly, large countries data also can be taken in to consideration for analysing the which countries stock market is more influenced by the macroeconomic variables.

#### **7. Hypothesis**

**H<sub>1</sub>:** Macroeconomic variables and SENSEX have no association.

**H<sub>2</sub>:** Macroeconomic variables and DOW JHONES have no association.

**H<sub>3</sub>:** Macroeconomic variables inflation rate, interest rate, GDP, and GDP PERCAPITAL put impact on SENSEX.

**H<sub>4</sub>:** Macroeconomic variables inflation rate, interest rate, GDP, and GDP PERCAPITAL put impact on DOW JHONES.

**H<sub>5</sub>:** Individual macroeconomic variable and SENSEX have no significant relation.

**H<sub>6</sub>:** Individual macroeconomic variable and DOW JHONES have no significant relation.

**H<sub>7</sub>:** Macroeconomic variables group of America and Indian stock market have relationship.

**H<sub>8</sub>:** Macroeconomic variables group of India and American stock market have relationship.

#### **8. Data Analysis and Interpretation**

**Table - 1**

MACROECONOMIC VARIABLES INDIA					
YEAR	Inflation rate	Interest rate	GDP	GDP PER CAPITA	BSE SENSEX
2015	5.87	7.6	7.99	6.79	26,117
2016	4.94	6.2	8.25	7.08	26,626
2017	2.49	5.5	7.04	5.91	34,056
2018	4.86	4.7	6.12	5.02	36,068
2019	7.66	7	5.02	3.96	41,253

Source: World Bank and BSE India

**Test of Normality of data**

For the testing the normality of data, Kolmogorov-Smirnov and Shapiro-Wilk have been used.

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Inflation Rate	.236	5	.200 <sup>*</sup>	.966	5	.848
Interest Rate	.156	5	.200 <sup>*</sup>	.982	5	.943
GDP	.196	5	.200 <sup>*</sup>	.941	5	.675
GDP Per Capita	.190	5	.200 <sup>*</sup>	.946	5	.707
SENSEX	.232	5	.200 <sup>*</sup>	.914	5	.495

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

As per the above analysis all the variables are more than significant level 0.05, stating the fulfilment of normality assumption.

**H<sub>1</sub>:** Macroeconomic variables and SENSEX have no association.

**Table – 2: Results of Inflation and SENSEX**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
Inflation rate and SENSEX	-.278	.651	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-2 there is a positive correlation exist between inflation rate and stock market in India. The correlation between inflation rate and stock market is 0.27. but the result is statistically insignificant because the P-value is more than 0.05 as per SPSS analysis. So, we

reject the hypothesis H1 that there is no significant association exist between inflation rate and stock market in India.

**Table – 3: Results of Interest rate and SENSEX**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
Interest rate and SENSEX	-.281	.647	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-3 there is a negative correlation exist as per the above table. In the above results that correlation of interest and SENSEX is -0.28. but the result is statistically insignificant because the P-value is more than 0.05 as per SPSS analysis. So, as per the results it is putative that the interest rate and SENSEX have no association.

**Table – 4: Results of GDP and SENSEX**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
GDP and SENSEX	-.981**	.003	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-4 strongly negative correlation of GDP and SENSEX has been found. The correlation between GDP and stock market is -0.98 which is very high, but the result is statistically significant because the P-value is less than 0.01 as per SPSS analysis. So, we reject the hypothesis H1 that negative association exist between GDP and stock market in India.

**Table – 5: Correlation between GDP PER CAPITA and stock market in India**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
GDP Per Capita and SENSEX	-.979**	.004	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-5 there is a strong negative correlation exist between GDP PER CAPITA and stock market in India. The correlation between GDP PER CAPITA and stock market is -0.97 which is very high, but the result is statistically significant because the P-value is less than 0.01

as per SPSS analysis. So, we reject the hypothesis H1 and concluded that there is a significant but negative association exist between GDP PER CAPITA and stock market in India.

**Table - 6**

MACROECONOMIC VARIABLES AMERICA					
YEAR	Inflation rate	Interest rate	GDP	GDP PER CAPITA	DOW JHONES
2015	0.73	2.16	2.88	2.13	19,167
2016	2.07	2.39	1.56	0.84	21,304
2017	2.11	2.15	2.21	1.57	26,103
2018	1.91	2.48	2.92	2.39	24,167
2019	2.29	3.47	2.33	1.85	28, 909

Source: World Bank and DJIA

**Test of Normality of data**

For the testing the normality of data, Kolmogorov-Smirnov and Shapiro-Wilk have been used.

Tests of Normality						
	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Inflation rate	0.356	5	0.137*	0.753	5	0.132
Interest Rate	0.337	5	0.466*	0.768	5	0.343
GDP	0.215	5	.200*	0.912	5	0.478
GDP Per Capita	0.178	5	.200*	0.953	5	0.762
DOW JHONES	0.153	5	.200*	0.985	5	0.960

\*. This is a lower bound of the true significance.  
a. Lilliefors Significance Correction

As per the above analysis all the variables are more than significant level 0.05, stating the fulfilment of normality assumption.

**H2:** Macroeconomic variables and DOW JHONES have no association.

**Table – 7: Correlation Results of Inflation and DOW JHONES**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
Inflation rate and SENSEX	.783	.118	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-7 there is a strong positive correlation exist between American stock market and Inflation. The correlation result is 0.78 between two variables. But the result is statistically insignificant because the P-value is more than 0.05 as per SPSS analysis. So, H1 is putative here and clear that DOW JHONES and inflation have no association.

**Table – 8: Correlation between Interest rate and stock market in America**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
Interest rate and SENSEX	.713	.177	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-7 there is a strong positive correlation exist between American stock market and Inflation. The correlation result is 0.78 between two variables. But the result is statistically insignificant because the P-value is more than 0.05 as per SPSS analysis. So, H1 is putative here and clear that DOW JHONES and interest rate have no association.

**Table – 9: Correlation between GDP and stock market in America**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
GDP and SENSEX	-.084	.894	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-9 there is a negligible correlation exist between GDP and stock market in America. The correlation between GDP and stock market is -0.08 and also the result is statistically insignificant because the P-value is more than 0.05 as per SPSS analysis. So, So, H1 is putative here and clear that DOW JHONES and GDP have no association.

**Table – 10: Correlation Results of GDP Per Capita and SENSEX**

Variables	Pearson Correlation	Sig. (Two-tailed)	N
GDP Per Capita and SENSEX	.091	.884	5

Corelation is (sig. 0.05\*)

Source: Calculated value SPSS version-26

As per table-10 there is a negligible correlation exist between GDP Per Capita and stock market in America. The correlation between GDP Per Capita and stock market is 0.09 and also the result is statistically insignificant because the P-value is more than 0.05 as per SPSS analysis. So, So, H1 is putative here and clear that DOW JHONES and GDP Per Capita have no association.

**H<sub>3</sub>:** Macroeconomic variables and DOW JHONES have no association.

**Table – 11: Analysis on significant impact**

Independent Variables	Dependent Variable	Hypothesis	P-Value (0.05)	Decision
Inflation	SENSEX	No Significant Impact	0.651	ACCEPT
Interest rate	SENSEX	No Significant Impact	0.647	ACCEPT
GDP	SENSEX	No Significant Impact	0.003	REJECT
GDP PER CAPITA	SENSEX	No Significant Impact	0.003	REJECT

Source: Author’s own Calculations

Multiple linear regression analysis has been used in the above table as an inquiry model, meeting all normality assumption. Although data obtained were not parametric for such factors, we have logged it to help spread data more usually. (Jamil & Hasnu, 2013). Table 11 shows that P-Value of inflation rate is insignificant because ( $0.651 > 0.05$ ). It verifies that the inflation rate has no influence during the study period on performance stock market in India. Interest rate is also insignificant because ( $0.647 > 0.05$ ). So, it confirms that interest rate put no impact performance of stock market. However, other two macroeconomic variables are statistically significant because both P Value is not more than alpha level 0.05. Reciprocate P-Value of GDP and GDP PER CAPITA are ( $0.003 < 0.05$ ) and ( $0.003 < 0.05$ ). In the analysis two macroeconomic variables (interest rate and inflation rate) show insignificant impact on stock market whereas other two variables (GDP and GDP PER CAPITA) showed significant impact on stock market in India in the study period 2015 to 2019.

**H<sub>4</sub>:** Macroeconomic variables inflation rate, interest rate, GDP, and GDP PERCAPITAL put no impact on DOW JHONES.

**Table – 12: Analysis on significant impact**

Independent Variables	Dependent Variable	Hypothesis	P-Value (0.05)	Decision
Inflation	DOW JHONES	No Significant Impact	0.117	ACCEPT
Interest rate	DOW JHONES	No Significant Impact	0.176	ACCEPT
GDP	DOW JHONES	No Significant Impact	0.893	ACCEPT

GDP PER CAPITA	DOW JHONES	No Significant Impact	0.883	ACCEPT
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Source: Author’s own Calculations

Table 12 shows that P-Value of inflation rate is insignificant because ( $0.117 > 0.05$ ). It verifies that Inflation rate has no influence on stock market performance during the study period. Interest rate is also insignificant because ( $0.176 > 0.05$ ). So, it confirms that interest rate also put no impact on stock market performance. Similarly, other two macroeconomic variables are also insignificant because both P-Value is greater than alpha level 0.05. Reciprocate P-Value of GDP and GDP PER CAPITA are ( $0.893 < 0.05$ ) and ( $0.883 < 0.05$ ). All the four macroeconomic variables (interest rate, inflation rate, GDP, and GDP PER CAPITA) showed insignificant impact on stock market in America during the study period from 2015 to 2019.

**H<sub>5</sub>:** Individual macroeconomic variable and SENSEX have no significant relation.

A. Significant relationship between Inflation and SENSEX in India.

**Table – 12: Results of Inflation and SENSEX**

<i>Parameters</i>	<i>Inflation rate</i>	<i>BSE SENSEX</i>
Mean	5.164	32824
Variance	3.50533	41622113.5
Remarks	5	5
D.F.	4	
t Value	-11.375777	
P value	0.00034055	
Critical t value	2.77644511	

Source: Author’s own Calculations

As per the above Table 12 the mean and variance of the Inflation are correspondingly 5.164 and 3.50533. The mean and variance of the SENSEX are correspondingly 32824 and 41622113.5. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H<sub>5</sub> is rejected and found both variables are statistically significant.

B. Analysis of Inflation and SENSEX in India with reference to their individual relation.

**Table – 13: Analysis on significant relationship between Interest rate and SENSEX**

<i>Parameters</i>	<i>Interest rate</i>	<i>BSE SENSEX</i>
Mean	6.2	32824
Variance	1.335	41622113.5
Remarks	5	5
D.F.	4	
t value	-11.37393	

P value	0.00034076	
Critical t value	2.77644511	

Source: Author's own Calculations

As per the above Table 13 the mean and variance of the Interest rate are correspondingly 6.2 and 1.335. The mean and variance of the SENSEX are correspondingly 32824 and 41622113.5. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H<sub>0</sub> is rejected and concluded that there is a statistically significant relationship exist between Interest rate and SENSEX during the period of study.

#### C. Significant relationship between GDP and SENSEX in India

**Table – 14: Analysis on significant relationship between GDP and SENSEX**

<i>Parameters</i>	<i>GDP</i>	<i>BSE SENSEX</i>
Mean	6.884	32824
Variance	1.79293	41622113.5
Remarks	5	5
D.F.	4	
t Value	-11.371951	
P value	0.000341	
Critical t value	2.77644511	

Source: Author's own Calculations

As per the above Table 14 the mean and variance of the GDP are correspondingly 6.884 and 1.79293. The mean and variance of the SENSEX are correspondingly 32824 and 41622113.5. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H<sub>0</sub> is rejected and found GDP and SENSEX during the period of study are significant statistically.

#### D. Significant relationship between GDP PER CAPITA and SENSEX in India

**Table – 15: Analysis on significant relationship between GDP PER CAPITA and SENSEX**

<i>Parameters</i>	<i>GDP PER CAPITA</i>	<i>BSE SENSEX</i>
Mean	5.752	32824
Variance	1.65327	41622113.5
Remarks	5	5
D.F.	4	
t Value	-11.37243907	
P value	0.000340938	
Critical t value	2.776445105	

Source: Author's own Calculations

As per the above Table 14 the mean and variance of the GDP PER CAPITA are correspondingly 5.752 and 1.65327. The mean and variance of the SENSEX are correspondingly 32824 and 41622113.5. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H<sub>0</sub> is rejected and found GDP and SENSEX during the period of study are significant statistically.

**H<sub>5</sub>:** Individual macroeconomic variable and SENSEX have no significant relation.

A. Significant relationship between Inflation and DOW JHONES in America.

**Table – 15: Analysis on significant relationship between Inflation and DOW JHONES**

<i>Parameters</i>	<i>Inflation rate</i>	<i>DOW JHONES</i>
Mean	1.822	23930
Variance	0.39092	14787646
Remarks	5	5
D.F.	4	
t Value	-13.91554995	
P value	0.000154648	
Critical t value	2.776445105	

Source: Author’s own Calculations

As per the above Table 15 the mean and variance of the Inflation are correspondingly 1.822 and 0.39092. The mean and variance of the DOW JHONES are correspondingly 23930 and 14787646. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H<sub>5</sub> is rejected and found inflation and DOW JHONES during the period of study are significant statistically.

B. Significant relationship between Interest rate and DOW JHONES in America.

**Table – 16: Results of Interest rate and DOW JHONES**

<i>Parameters</i>	<i>Interest rate</i>	<i>DOW JHONES</i>
Mean	2.53	23930
Variance	0.29675	14787646
Remarks	5	5
D.F.	4	
t Value	-13.91477256	
P value	0.000154682	
Critical t value	2.776445105	

Source: Author’s own Calculations

As per the above Table 16 the mean and variance of the Interest rate are correspondingly 2.53 and 0.29675. The mean and variance of the DOW JHONES are correspondingly 23930 and 14787646. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H<sub>5</sub> is rejected and found interest rate and DOW JHONES during the period of study are significant statistically.

C. Significant relationship between GDP and DOW JHONES in America.

**Table – 17: Analysis on significant relationship between GDP and DOW JHONES**

<i>Parameters</i>	<i>GDP</i>	<i>DOW JHONES</i>
Mean	2.38	23930
Variance	0.31135	14787646
Remarks	5	5

D.F.	4	
t Value	-13.91328566	
P value	0.000154747	
Critical t value	2.776445105	

Source: Author’s own Calculations

As per the above Table 17 the mean and variance of the GDP are correspondingly 2.38 and 0.31135. The mean and variance of the DOW JHONES are correspondingly 23930 and 14787646. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H5 is rejected and found GDP and DOW JHONES during the period of study are significant statistically.

D. Significant relationship between GDP PER CAPITA and DOW JHONES in America.

**Table – 18: Results of GDP Per Capita and DOW JHONES**

<i>Parameters</i>	<i>GDP PER CAPITA</i>	<i>DOW JHONES</i>
Mean	1.756	23930
Variance	0.35608	14787646
Remarks	5	5
D.F.	4	
t Value	-13.91401467	
P value	0.000154715	
Critical t value	2.776445105	

Source: Author’s own Calculations

As per the above Table 18 the mean and variance of the GDP PER CAPITA are correspondingly 1.756 and 0.35608. The mean and variance of the DOW JHONES are correspondingly 23930 and 14787646. The analysis of the t test divulges that as the P-value is less than 0.05 percent. This means H5 is rejected and concluded that there is a statistically significant relationship exist between GDP PER CAPITA and DOW JHONES during the period of study.

**H7:** There is a significant relationship exist between macroeconomic variables group of America and Indian stock market.

**Table – 19: Analysis on significant relationship between macroeconomic variables group of America and BSE SENSEX.**

SUMMARY					
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>	
Inflation rate	5	9.11	1.822	0.39092	
Interest rate	5	12.65	2.53	0.29675	
GDP	5	11.9	2.38	0.31135	
GDP PER CAPITA	5	8.78	1.756	0.35608	
BSE SENSEX	5	164120	32824	41622114	

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4309102704.07	4	1077275676.02	129.4115	0.00	2.866081
Within Groups	166488459.4	20	8324422.971			
Total	4475591163	24				

Source: Author's own Calculations

Here in Table-19 we can see that F-value 129.41 is greater than F-Critical value 2.866 in the analysis. Similarly, P-Value in the analysis is less than stated alpha value 0.05 percent. Therefore, it is the evidence to reject the null hypothesis  $H_7$  that there is a significant relationship exist between the macroeconomic variables group of America and Indian stock market.

**H<sub>8</sub>:** There is a significant relationship exist between macroeconomic variables group of India and American stock market.

**Table – 20: Analysis on significant relationship between macroeconomic variables group of India and DOW JHONE.**

SUMMARY

Groups	Count	Sum	Average	Variance
Inflation rate	5	25.82	5.164	3.50533
Interest rate	5	31	6.2	1.335
GDP	5	34.42	6.884	1.79293
GDP PER CAPITA	5	28.76	5.752	1.65327
DOW JHONES	5	119650	23930	14787646

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	2289431112	4	572357777	193.5255	0.00	2.866081
Within Groups	59150617.15	20	2957531			
Total	2348581729.06	24				

Source: Author's own Calculations

Here in Table-20 we can see that F-value 193.52 is greater than F-Critical value 2.866 in the analysis. Similarly, the value of P is smaller than 0.05% in the study. Therefore, the null hypothesis  $H_8$  is dismissed as proof that there is a substantial connection between both the Indian macroeconomics group and American stock market.

## **9. Findings**

From the above analysis the author concludes that the association that exist between rate of interest and Indian stock market is negative. There is a strong negative association exist between GDP and GDP PER CAPITA with the Indian stock market. Whereas in case of association between inflation rate and stock market in India, it is found moderately positive. However, the results of association between Inflation and Interest rate are statistically insignificant whereas the association results of GDP and GDP Per Capital is statistically significant.

In America there is strong positive association exist amid Inflation, Interest rate with stock market. In case of GDP PER CAPITA, the association is positive but in weak form. However, in case of America the association between GDP and stock market the results are negative but in weak form. However, all the variables are statistically insignificant in association with the performance of stock market in America. So, it is clear that three macroeconomic variables in India have negative association with stock market and one is positively associated. In America all macroeconomic variables are positively associated but insignificant except GDP with the stock market performance.

When interpretation is made on significant impact of macroeconomic factors on stock market in India, GDP and GDP PER CAPITA shows significant impact but inflation and interest rate show insignificant impact. So, in India inflation and interest rate put no impact on stock market.

In comparison, in America we support the hypothesis H4 that all factors were negligible and did not influence stock market performance, provided the macro-economic variables effect on stock market performance at 0.05 level.

All macroeconomic variables are statistically important in the case of an individual relationship between each macroeconomic variable and the stock market in both countries.

As per the analysis in case of interrelationship between macroeconomic variables and stock market of both the country, it is found that macroeconomic variables are statistically significant thereby rejecting the hypothesis seven and eight concluding that there is no interrelation impact exist between the two nations.

## **10. Conclusion**

The results of this empirical research uncover new information that improves the prospects of academics, investors, policymakers, and others to understand and use it to support diversity and sustainability in financial intermediation. The main purpose of this research paper is to analyse the significant impact and relationship between Indian and American stock markets as well as the important interaction between macroeconomic variables. For portfolio managers interested in global asset allocating the assets globally nowadays thereby meeting the expectations of investors for offsetting the foreign exchange risk, the connection amid macroeconomic variables and stock prices is much needed. The results from this study opens the path for wide research and further study relating to this field may undertake by other researchers. Other macroeconomics variables impact on stock market can be considered for new research finding and development. Variables like BOP, GCF, FIIs must be taken for further research so that a better picture on macroeconomics perspective towards performance of stock market could be revealed. Looking forward, it would be important in future studies to

incorporate and endogenize additional qualitative factors such as event studies and governance indicators in the perspective of performance of stock market between both the country.

## **11. References**

1. Abugri, B. A. (2008). Empirical Relationship between Macroeconomic Volatility and Stock Return: Evidence from Latin American Markets. *International Review of Financial Analysis*, Vol. 17(2), pp. 396-410.
2. Adam, Anokye M. and Tweneboah, George (2008). Macroeconomic Factors and Stock Market Movement: Evidence from Ghana.
3. Agrawalla (2008). Share Prices and Macroeconomic Variables in India: An Approach to Investigate the Relationship between Stock Markets and Economic Growth. *IGIDR Money & Finance Conference*.
4. 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.
5. Basher, S. A., Haug, A. A. and Sadorsky, P. (2012). Oil prices, exchange rates and emerging stock markets. *Energy Economics*, Vol. 34(1) pp. 227-240.
6. Ben Naceur, S., Ghazouani, S., and Omrani, M. (2007). The determinants of stock market development in the Middle-Eastern and North African region. *Managerial Finance*, Vol. 33(7), pp. 477-489.
7. Bhargava, A. (2014). Firms' fundamentals, macroeconomic variables and quarterly stock prices in the US, *Journal of Econometrics*. 183(2), pp. 241-250.
8. Choi, Jongmoo, Hauser and Kopecky, J. Kenneth (1999): "Does the Stock Market Predict Real Activity? Time Series Evidence from the G-7 Countries", *Journal of Banking and Finance*, Vol.23, Issue 12, pp.1771-1792.
9. 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.
10. Coleman, A. K. and Tettey, K. F. A. (2008). Impact of macroeconomic indicators on stock market performance. *Journal of Risk Finance*, Vol. 9(4), pp. 365-78.
11. Darat, A.F. and Mukherjee. T.K. (1987). "The Behaviour of a Stock Market in a Developing Economy", *Economic Letters*, 22, 273-278.
12. Dimson, E., Marsh, P. & Staunton, M. (2002). *Triumph of The Optimists: 101 Years of Global Investment Returns*. Princeton University Press, New Jersey.

13. 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.
14. Mahedi, M. (2012), Impact of the macroeconomic variables on the stock market returns: The case of Germany and the United Kingdom. *Global Journal of Management and Business Research*, 12(16), 22-34.
15. Mohammad, B.A. (2011), Impact of micro and macroeconomic variables on emerging stock market return: A case on Dhaka stock exchange (DSE). *Interdisciplinary Journal of Research in Business*, 1(5), 8-16.
16. Nishat, M. (2004), Macroeconomics factors and Pakistan equity market. *Pakistan Development Review*, 43(4), 619-637.
17. Pal, K., Mittal, R. (2011), Impact of macroeconomic indicators on Indian capital markets. *Journal of Risk Finance*, 12(2), 84-97.
18. Pethe, A., Karnik, A. (2000), Do Indian stock markets matter? Stock market indices and macro-economic variables. *Economic and Political Weekly*, 35, 349-356.
19. Panda, Chakradhara and Kamaiah B. (2001): "Monetary Policy, Expected Inflation, Real Activity and Stock Returns in India- An Empirical Analysis." *Asian-African Journal of Economics and Econometrics*, Vol.1 (2), pp. 191-200.
20. Prabakaran, V. (2014). Dynamic Interactions of Macroeconomic Variables and Stock Market Movements in India. *Global Management Review*, 8(4).
21. Ramadan, B.M., Elgazzar, S.H., Hanafy, KM. (2016), Impact of macroeconomic variables on stock markets: Evidence from emerging markets. *International Journal of Economics and Finance*, 8(1), 195-207.
22. 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.
23. Sarkar, P. (2005), *Stock Market, Capital Accumulation and Growth in India since 1950*, SSRN.
24. Sudhakaran, S., & Balasubramanian, P. (2016, September). A study on the impact of macroeconomic factors on S&P BSE Bankex returns. In *Advances in Computing, Communications and Informatics (ICACCI)*, 2016 International Conference on (pp. 2614 2618). IEEE.
25. Siddiqui, S., & Seth, N. (2015). Do Global Oil Price Changes Affect Indian Stock Market Returns? *Journal of Management & Public Policy*, 6(2).

26. 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.