Analysis of Impact of Gross Domestic Products (GDP) on Stock Market Returns in India

¹Prin.Dr. Kishorsinh N. Chavda . , ²Tarsariya Mahendra Kumar S.

¹Principle, J.Z.Shah Arts & H.P. Desai Commerce College, Surat

²Assistant Professor, Shree CJ Patel Vidhyadham Commerce College, Surat

_____

Abstract: The Economic growth of any country is depends upon the capacity of producing goods and services of a particular country. Aggregate economic growth of particular country is measured by Gross National Products (GNP) or Gross Domestic Products (GDP). Gross Domestic Products, Unemployment rate, price indexes, fiscal and monetary policy- these all are the main indicators of economics growth. Foreign exchange rate is also one of the most important indicator of economic growth. This study uses BSE SENSEX Index of last ten years, taken as a supportive variable of GDP. This study shows there is positive or linear or Significant relationship between BSE SENSEX Index and GDP Growth Rate in India.

Keywords: GDP (Gross Domestic Product), Foreign Exchange Rates, Import, Export, GNP (Gross National Product), BSE, SENSEX Index.

_____

I. INTRODUCTION

I.Gross Domestic Products (GDP): GDP per capita is the total market values of (final i.e. not intermediate) goods and services produced within nations divided by the total population. Size of Economy of any country is measured through Gross Domestic Products Now-a-days. Indian economy is 9th largest economy in the world by nominal GDP And 3rd largest by PPP (Purchasing Power parity). To knowing the changes in outputs and standard of living of people, GDP and GDP per capita is one of the best measure. Gross domestic product (GDP) is one of the most important concepts for government and decision makers for planning and policy formulation. With the help of GDP, we can find out whether the economy is in recession, depression or boom. GDP is the comprehensive signal of National Income of the nation. The formula of find out GDP are as under.

$$GDP = C + I + G + (X - M)$$

Where, C = Annual Consumption (Personal Consumer Expenditure)

     I = Gross Private Domestic Investment

     G = Government Spending

     X = Total Amount of Exports

     M = Total Amount of Imports

     (X-M) = Total Net exports (Total Net exports also May be Negative)

I. Annual Consumption: It is the Significant difference between personal consumption Expenditure and Household spending on Consumer Goods. It includes the following goods and services.

- ➤ Durable Goods
- ➤ Non-Durable Goods
- ➤ Services

II. Gross Private Domestic Investment: It includes the following types of investment.

- ➤ Gross Private Investment
- ➤ Residential Investment
- ➤ Non-residential Investment
- ➤ Changes in business inventories

III. Government Spending: It includes the consumption, expenditure and investment of federal, local and state governments in final goods and services.

IV. Net Exports: Net Exports refer to Significant or insignificant difference between total amount of Exports minus total amount of imports. So, here Net Exports of the nation can be either positive or negative.

$$Net Exports = Gross Exports - Gross Imports$$

Here, Annual Consumption (C), Total Investment (I), and Government Spending (G) are expenditure on final goods and services while intermediates expenditure on Goods and services is not considered for calculating GDP. The following are the main three approaches for determining the value of Gross Domestic Products (GDP)

1. **Production Approach:** Production Method is also known as a **Output Method** and **Value Added Method.** As per production Approach, GDP is finding out by calculating the total value of Goods and services produced by the particular country. The formula of finding GDP at market price as per this method is as follows.

GDP at Market Price = Total value of production/Output -

Intermediaries Consumptions At Factor Cost) + Indirect Taxes – Subsidies on the goods and services which is not included in valuation of Output.

2. **Income Approach :** This approach is primarily based on those institutional units who is directly engaged with the production of goods and services for a specific period of time. As per Income approach, the formula of finding GDP at market price is as under.

GDP at Market Price = National Income + Depreciation (Capital Consumption Allowance) + Indirect Taxes + Net Factor payment to the rest of the world – Subsidies (on production & Imports). Here, in this formula, National Income of country include the following incomes.

   ➢ Corporate Profits before Tax
   ➢ Owner's / Proprietor's Income
   ➢ Compensation of employees
   ➢ Total interest & other Investment income
   ➢ Total Rental Income

3. **Expenditure Approach :** For determining GDP as per Expenditure method, the following expenditure is to be taken into the account.

   ➢ Personal Expenditure on Consumer Goods and services
   ➢ Fixed Capital of business
   ➢ Business Inventories
   ➢ Government Expenditure on goods and services
   ➢ Government Investment
   ➢ Imports and exports of goods and services

The formula of finding GDP as per Expenditure method is as under.
GDP at Market price = C + I + G + (X- M)
Where, C = Consumption
   I = Investment
   G = Government Spending
  (X- M) = Net Exports (Total Exports – Total Imports)
Types of GDP: There are total two types of GDP.
1.Real GDP – Real GDP means, valuations of goods and services produced by the country is at base year price. And such base year price is constant.
2. Nominal GDP – Nominal GDP means, Valuations of goods and services produced by the nation is at current year Prices. And such prices is change as per changes in rate of inflation.
II. Stock Market: A stock market is also known as a Equity market or share Market Stock market is one of the most important part of economy of the country. It is a one kind of centralized market place in which buyer buy the shares and seller sell the shares, price is determined on the basis of demand and supply of shares. The Indian stock Market is regulated by SEBI. In India, BSE (Bombay Stock Exchange) is one of the oldest stock exchange established in 1875. And today, more than 5000 companies are listed on BSE. The main centralized objective of share market is as follows.

   ➢ To establish a nation-wide trading facility.
   ➢ To safeguard the Interest of investing People.
   ➢ To provide efficient communication network.
   ➢ To encourage the people to invest their Money in various corporate securities like share, Debentures, Bonds etc.
   ➢ To establish and promote honourable and just practices in security transaction.
   ➢ To promote, develop and maintain the well-regulated market in the country.
   ➢ To guide, educate and protect the rights and interests of individual investors.
   ➢ To promote growth and development of industry in a country by way of mobilization of resources and providing liquidity to the country.

Factors Affecting Stock Market Returns: The following factors is mostly affect the price of shares in the stock market.
  I. **Economic Factors:**
    ➢ Interest Rates
    ➢ Exchange Rates
    ➢ GDP
  II. **Firm Specific Factors:**
    ➢ Capital budgeting Decision
    ➢ Dividend policy of the company
    ➢ Debts level of the company
    ➢ Offerings and Repos
    ➢ Acquisition and divestiture / Divestment
  III. **Market Related Factors :**
    ➢ January Effect(Generally stock price is increase in January month)
    ➢ Noise Trading
    ➢ Technical Analysis
    ➢ Repetitive patterns of price movements

II. LITERATURE REVIEW

Prof. D. V. Lokeswar Reddy had written in his Research paper on "IMPACT OF INFLATION AND GDP ON STOCK MARKET RETURNS IN INDIA" (2009) in International Journal of Advanced Research in Management and Social Sciences. He uses various statistical methods (Regression Analysis) and Accounting tools for Analysing the impact of inflation, interest rates and GDP on Stock Market Returns in India. And finally he conclude that, there is significant relationship between stock market Returns in India and rate of interest. And also prove there is significant relationship between GDP and stock market Returns in India.

Prof.Nashir Shamshi had written in his paper on " IMPACT OF GDP ON ECONOMIC DEVELOPMENT" (2013) , that GDP is one of the most authentic economic indicators to measuring the well being of the country. He also explain the various approaches and types of GDP in the context of Economics growth and development of the country. Prof.Nashir Shamshi concluded that there is linear or significant relationship between stock market Returns and GDP growth rate of the country.

Prof. Hatane Semuel and Stephanie Nurina, had written in his paper on "ANALYSIS OF IMPACT OF INFALTION, INTEREST RATES AND EXCHANGE RATES ON GDP ON INDONESIA "(2015) in Proceedings of the International Conference on Global Business, Economics, Finance and Social Sciences. In this study he uses inflation, interest rates, and exchange rates as a supporting variable of GDP. He concluded that, there is negative relationship between interest rate and GDP ,while there is linear or positive relationships between GDP and Exchange Rates.

III. TESTING OF HYPOTHESES

H0: There is no significant relationship between GDP Growth Rate and Stock market Returns.

H1: There is Significant relationship between GDP Growth Rate and stock market Returns.

IV. RESEARCH METHODOLOGY

Being the explanatory research, the Analysis is based on secondary source of data. For Analysis data had been collected from official website of the company, Various blogs / portal, articles , website , Various reference books , and newspaper. The accessible secondary data is intensively used for research study.

 Data Collection : For Analysis the impact of GDP Growth rate on Stock Market Returns, data had been collected from the official website of BSE (Bombay Stock Exchange). Data of GDP growth rate is collected from World bank Reports and other websites, World data bank etc. In stock market ,there are total two main indices of Bombay stock exchange.

1. **BSE SENSEX Index**
2. **Nifty 50**

BSE SENSEX Index is also known as a BSE Sensitive Index.It is calculated on the basis price of different 30 listed companies in Bombay Stock Exchange by using Free Float Market Capitalisation method. And this indicates market conditions or strength of market in economy. Last 10 year (From 2008 to 2017)data regarding the BSE SENSEX Index is collected from official Portal of Bombay Stock Exchange

Nifty 50 Index is introduced by NSE (National Stock Exchange) while SENSEX Index is introduced by NSE (Bombay Stock Exchange). It is Owned and managed by India Index Services and Products (IISL). Nifty 50 Index is calculated by taking 50 active stock listed in National Stock Exchange (NSE).

V. DATA ANALYSIS

Various descriptive tools of statistics, measurements of central tendency, variations, shape etc. is used in this study to defined the impact of GDP growth rate on stock market returns. For the purpose of Analysis, Daily Average of BSE SENSEX Index, from the year 2008 to 2017, is taken in to account. The following Statistical tools has been used in this Analysis.

- Mean
- Geometric Mean **(GM)**
- Median
- Variance
- Co-Variance **(COV)**
- Standard Deviation **(S.D)**
- Co-efficient of Variance **(C.V)**
- Standard Error of Mean **(SEM)**
- 95% Confidence Limit **(C.L)**
- Min Value
- Max Value
- Range
- Inter-quartile Range **(I.R)**
- Skewness
- Kurtosis
- t-statistics (**t-cal**)
- Karl Pearson Correlation
- Spearman's Rank Correlation
- Regression Analysis
- ANOVA(One Way)

Trend of Average BSE SENSEX index and GDP Growth Rate :

Year	BSE SENSEX INDEX	GDP GR

2008	14,492.68	3.891
2009	13,700.82	8.48
2010	18,206.91	10.26
2011	17,777.77	6.638
2012	17,617.04	5.081
2013	19,722.46	6.899
2014	24,638.95	7.168
2015	27,352.17	8
2016	26,372.76	7.1
2017	30,928.83	6.3
(Table No : V (1))		

The above table shows the Growth Rate of GDP and Average daily BSE SENSEX Index from the year 2008 to 2017. Highest growth rate (i.e. 10.26) in GDP is found in the year 2010 ,while lowest growth rate(i.e. 3.891) is found in the year 2008. BSE SENSEX Index is continuously increased from the year 2008 to 2017. Highest SENSEX index is found in the year 2017 and lowest in the year 2009. When Growth rate of GDP is 8 % in the year 2015 ,then BSE SENSEX Index is 27,352.17 , thereafter growth rate in GDP is declined and finally growth rate in the year 2016 is 7.1% then BSE SENSEX Index is also declined from 27,352.17 to 26,372.76.

1) Analysis by Using Descriptive tools of statistics: Descriptive tools of Statistics include the measurement of central tendency, Standard Deviations, Variance, SEM , Range, Inter-quartile Range, Median , Co-Variances , 95% Confidential Limit of mean , Kurtosis , Skewness , etc. It also includes correlation and regression analysis.

Descriptive Tools	BSE SENSEX INDEX	GDP GR
Mean	21081.039	6.982
GM	20365.899	6.769
Median	18964.685	6.999
Variance	3.4206	3.093
SD	5848.632	1.759
SEM	1849.5	0.556
95% C.L.	(16,897.18) - (25,264.9)	(5.72)-(8.24)
MIN	13700.82	3.891
MAX	30928.83	10.26
Range	17288.01	6.369
IR	9781.66	2.12
Skewness	0.419	0.074
Kurtosis	-1.153	0.822
Sum	2,10,810.39	69.817
S.S.	4.75287E9	515.274
Sample Size	10	10

The above various tools of descriptive statistics deliberated for GDP growth rate and BSE SENSEX Index, for the year 2008 to 2017.

The BSE SENSEX Index has an average valued by 21,081.039 and it is deviated from mean value by 5848.632. While in GDP growth rate, average growth rate is 6.982 and it is deviated by mean value by 1.759. Standard Deviations indicates that mean move away from mean Value by 1.759. While the coefficient of Variance is described in percentage. Geometric mean is always less than to mean or average or Equal to the mean or average. It indicates the compound returns in case of BSE SENSEX Index.

In BSE SENSEX Index, Median 18,964.685 shows the middle Value that has been ordered from lowest to highest for the year 2008 to 2017.GDP growth rate has 6.099% growth rate that has been ordered from lowest to highest growth rate for the year 2008 to 2107. Rang described the significant difference between minimum value and maximum value. In BSE SENSEX Index, minimum index is in the year 2009 (13,700.82) while maximum index is in the year 2017 (30,928.83) so, here the range is significant difference between these two indexes is 17,288.01 while in GDP growth rate range is 6.369. Higher the range ,lower will be the authenticity of data and results and vice a versa.

For measuring the normality of the data , Skewness and kurtosis has been used. The Skewness of both the variable BSE SENSEX Index and GDP growth rate is positive i.e. 0.419 and 0.074. It mean ,both variable or distribution is positively skewed. Positive Skewness indicates that data used in the analysis is positively skewed or skewed right. Kurtosis of BSE SENSEX Index is valued by -1.153 which is less than 3, so we can say that such distribution is platykurtic, while kurtosis of GDP growth rate is 0.822

which is also less than 3 ,also indicates that such distribution is platykurtic distribution. So, in this distribution Quartiles is best measure rather than mean.

Standard Errors of mean (SEM) is 1849.5 while 0.556 in case of GDP growth rates. SEM indicates accuracy in the data. Higher the SEM, higher will be the authenticity of distribution and data. 95% Confidential limit show that, the mean value is lies between two particular value. 95% confidence limit in BSE SENSEX Index is from 16,897.18 to 25,264.9. It means, the mean or average of that distribution must be lies between that value.

2.Karl Pearson Correlation:

Karl Pearson correlation indicates the relationship between two variables. If the correlation between two variables is positive then we can say that, there is significant relationship between these two Variable. Here, the correlation between BSE SENSEX Index and GDP growth rate is 0.093725592. Correlation is positive i.e. 0.094 , so we can say that, there is significant relationship between GDP growth rate and BSE SENSEX Index.

Spearman's Rank Correlation for this distribution is 0.1152. It is also positive, indicates there is correlation between two Variable i.e. GDP growth rate and BSE SENSEX Index.

The t-statistics for this distribution is 5.9753 And the value of Degree of freedom is (n-1)= 10-1 = 9, so, tabulated value of t is 1.812.

$$t\text{-cal} = 5.9753$$
$$D.F = n -1$$
$$= 10-1 = 9$$
$$t\text{-tab } (0.05) = 1.812$$

t-cal	**T-tab (0.05)**
5.9753 >	1.812

Here, t-cal or t-statistics is greater than the tabulate value of t at 5% level of significance. And hence ,we reject the null hypothesis (H0). And accept the alternate hypothesis (H1). So, here , we can say that, there is Significant relationship between GDP growth rate and BSE SENSEX Index.

3. Regression Analysis

Regression Analysis of GDP growth rate with BSE SENSEX Index :

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.093725592
R Square	0.008784487
Adjusted R Square	0.115117453
Standard Error	6176.103862
Observations	10

ANOVA

	df	SS	MS	F	Significance F
Regression	1	2704378.437	2704378.437	0.070898	0.796766831
Residual	8	305154071.4	38144258.92		
Total	9	307858449.8			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	18904.7412	8403.4394	2.2496437	0.0545978	-473.6248739	38283.10728
GDP GR	311.7145962	1170.679457	0.2662681	0.796766831	-2387.87707	3011.306263

RESIDUAL OUTPUT

Observation	Predicted Average BSE SENSEX INDEX	Residuals	Standard Residuals
1	20117.6227	-5624.942697	-0.966005887
2	21548.08098	-7847.26098	-1.347658227
3	22102.93296	-3896.022961	-0.669087903
4	20973.90269	-3196.132693	-0.548891458
5	20488.56307	-2871.523067	-0.493144257

6	21055.2602	-1332.800203	-0.228889948
7	21139.11143	3499.838571	0.601048729
8	21398.45797	5953.712027	1.022467459
9	21117.91484	5254.845163	0.902446769
10	20868.54316	10060.28684	1.727714722

Regression Analysis between GDP growth rate and BSE SENSEX Index shows there is positive significant correlation between these two Variable. From the above table f cal-value is less than the f tabulated value. So, we reject the null hypothesis at 5% level of significance. The correlation between GDP growth rate and BSE SENSEX Index is r = 0.093725592 which shows positive relationship between GDP growth rate and BSE SENSEX index. Co-efficient of determination is 0.008784487. In Another word 0.009 % of volatility in BSE SENSEX Index is due to variations in growth rate in GDP. And Hence, we can say that, there is positive correlation between GDP growth rate and BSE SENSEX Index.

VI. CONCLUSION

This Research Segment deals with investigation and understanding for growth rate in GDP and performance of Indian stock market BSE SENSEX Index. There are different types of statistical tools used for analysis of data and interpret for the proper analysis of objectives. Coefficient correlation, coefficient determination R2 has used for effects and association between Indian stock indexes and growth rate in GDP. These tools used for find propositional effects and degree of correlation between BSE SENSEX. F-test to determine the overall significance of the regression model. At last researcher has employed correlation co-efficient matrix for GDP and performance of BSE SENSEX. The Study on Impact of BSE SENSEX Index on GDP growth rate shows that, SENSEX Index of BSE is significantly affect on growth rate of GDP. BSE SENSEX Index is increased, then growth rate in GDP is also increased. Correlation between both variable is significant i.e. 0.0937 shows the positive relationship. Specifically ,the findings suggest that role of stock market (BSE SENSEX Index) is one of the most important influencing factors of GDP and vice a versa. So , the GDP is predictible variables for Indian stock market returns. Conclusvily,the government should try to maintain the growth rates of GDP and liquidity in the primary, secondary and derivatives market of stock market.

VII.REFERENCE:

1. https://www.investopedia.com/terms/e/economicgrowth.asp
2. https://www.researchgate.net/publication/311588566_The_Effect_of_Exchange_Rate_on_Economic_Growth
3. https://www.investopedia.com/university/macroeconomics/macroeconomics9.asp
4. https://www.slideshare.net/mobile/hiten91/foreign-exchange-market-in-india
5. https://www.slideshare.net/mobile/dsthakur86/determinants-of-foreign-exchange
6. http://www.scb.se/en/finding-statistics/statistics-by-subject-area/trade-in-goods-and-services/foreign-trade/foreign-trade---exports-and-imports-of-goods/pong/statistical-news/exports-imports-and-net-trade-balance-december-2016/
7. https://www.bseindia.com/sensexview/IndexArchiveData.aspx?expandable=3
8. https://www.statista.com/statistics/263617/gross-domestic-product-gdp-growth-rate-in-india/
9. https://www.indexmundi.com/india/gdp_real_growth_rate.html
10. 10.https://tradingeconomics.com/india/gdp-growth-annual
11. https://www.slideshare.net/mobile/A_S_I_F/impact-of-gross-domestic-product-gdp-on-economic-development
12. 12.https://www.google.co.in/amp/s/www.indiainfoline.com/article-amp/research-reports/gdp-and-its-importance-30742481_1.h
13. https://www.slideshare.net/mobile/VladilenaDaly/the-three-approaches-to-measuring-gdp
14. http://www.economicsdiscussion.net/national-income/3-alternative-methods-used-for-measuring-national-income/799
15. http://www.iasscore.in/upsc-prelims/national-income-conceptcalculation-of-national-income
16. https://www.slideshare.net/mobile/A_S_I_F/impact-of-gross-domestic-product-gdp-on-economic-development
17. https://www.tflguide.com/sensex-nifty/
18. 18.https://www.google.co.in/url?sa=t&source=web&rct=j&url=https://www.coursehero.com/file/p460fh7/A-PhD-THESIS-ON-ROLE-OF-FOREIGN-INSTITUTIONAL-INVESTORS-IN-INDIAN-STOCK-MARKET/&ved=2ahUKEwi9v35uevaAhUG148KHQfABUgQFjAAegQICBAB&usg=AOvVaw0DyxaX5LHPTTK8i5_px4m2