RESEARCH NOTES

A STUDY ON THE RELATIONSHIP BETWEEN GROSS DOMESTIC PRODUCT AND STOCK MARKET PERFORMANCE IN INDIA

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1. Introduction

Macroeconomics deals with aggregate economic activities such as production, supply, national income, employment, inflation, interest rates in markets, exchange rates and other factors. The change in macro economic variables strongly affects the variables of micro economy which deals with small units and individual firms. On the other hand, financial system refers to a systematic arrangement of flow of funds from surplus to deficit units comprises of financial instruments, institutions, services and financial markets. In developed economies development of financial markets is very significant which later on extended to the emerging countries like India. The stock market or securities exchanges are secondary markets where already issued shares bought and sold and provide high liquid to investors. In India, two types of stock exchanges are working now namely Bombay stock exchange since 1875 and new stock exchange National stock exchange since 1992. The two stock exchanges have two individual indices namely SENSEX and NIFTY which are considered as barometers of economic development of the country. The academic and industrial research studies proved significant relationship among macro economic variables and stock market indices. The study is undertaken to understand the trend and predication of share prices behavior and their impact on the future add value to the investor funds.

The research studies of Pooja joshi (2015) support that macro economic factors such as GDP and interest rates are strong determinants of stock market performance in India. The stock market performance is measured in the performance value of NIFTY and SENSEX point's movements periodically. The advance in points indicates uptrend and positive responses to the changes in economy where as decline in points indicates down trend and negative shows the changes in economy. The analysis of macroeconomic factors on stock market is part of fundamental analysis comprises of other two more factors i.e. industrial and company specific factors. However, the impact of macroeconomic variables is wider

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and affects entire stock market where as industrial factors and company factors affect share prices of particular industry and company (Manju KV2019). In the present study only macro economic factors in general and GDP in particular is analyzed to fund its effect on stock market indices in India.

CONEPTUAL FRAMEWORK

GDP: The entire economic output indicates the size of economy in the nation. The popular tool for measuring economic output is the Gross Domestic Product. Gross Domestic Product (GDPs defined as the total value of final goods and services produced within a country's territories in a particular period (one year), irrespective of ownership (Shula, Kampamba (2017). GDP measures only value of final goods and services consumed by final user rather than inputs used into other goods. GDP is measured in three approaches such as expenditure, product and income approaches. GDP calculation formula in India: 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). Annual consumption refers to difference between personal consumption Expenditure and household spending on Consumer Good, Gross Private Domestic Investment comprises of Gross Private Investment, Residential Investment, Non-residential Investment and Changes in business inventories. Government Spending refers to consumption, expenditure and investment of federal, local and state governments in final goods and services. Net Exports: Net Exports refer to Significant or insignificant difference between total amounts of Exports minus total amount of imports (Kishorsinh Chavd,N.& Tarsariya Mahendra Kumar S (2018). In India GDP is measured in two variables such as GDP at current prices (without adjustment of inflation) and GDP constant prices (with adjustment of inflation rate). Both variables took as independent variables in the present study.

BSE SENSEX:

Bombay stock exchange is the oldest stock exchange in Asia working since 1875. However, the BSE formed an index with top 30 companies of financial and high liquid assets since 1986. The BSE SENSEX is popular and standard bench mark most tracked index in India and in the world. This index comprises of 30 companies from 13 sectors. The value of index was calculated on the basis of free market capitalization since 2003. The various stakeholders consider SENSEX as economic barometer of the India. Therefore, present study took BSE SENSEX as stock market performance indicator.

NSE NIFTY: National stock exchange is new and modern technology based stock market established in 1992. The NSE NIFTY is also an equity index represents the 50 companies with strong financial and liquid feature. NIFTY was constituted on 22 April 1996. In very short period NSE emerged as world largest index in terms of volume. Therefore, NSE NIFTY Index is taken as dependent variables to measure the stock market performance in the present study.

REGRESSION TOOL:

REVIEW OF LITERATURE

Kishorsinh Chavd, N.& Tarsariya Mahendra Kumar S (2018) found significant positive correlation between GDP growth and BSE SENSEX. Shula, Kampamba (2017) examined the relationship between macro economic factors on SENSEX. The study found positive relationship between GDP and exchange on stock market indices. Manju K Vmanju KV(2019) investigated inter connection to GDP and stock market volatility of 51 developed countries for the period of 1990-2016 and revealed strong positive relationship between GDP and stock volatility. S. Sundara Ram (2022) study supported strong positive association with GDP, Consumer price index, inflation exchanges rates on stock market fluctuations in the case of banking sector for the period of 2007-2018. Similarly, Pooja joshi (2015) found that increase in real GDP leads to economic growth, stock prices, and improve investor's confidence in the India. The study is specially focused on the sartorial indices. Saji TG (2011) emphasized on the impact of economic factors on the share price behavior of IT sector fort the period of 2002-2009 through ACF, VAR and regression analysis. The study on economic factors such as GDP IIP, WPI and forex reserves and exchanges support positive growth in stock market prices of IT sector during the study period. In contrast to the above positive relations, Marceline Adella Violeta (2020) found no impact of GDP on the stock market performance in these two countries during the study period in the context of Indonesia and Malaysia for the period of 2006-2015 through regression analysis. The study data is free from heteroscedasticity, autocorrelation, and multicollinearity.

RESEARCH PROBLEM: The review of literature found number of research articles on the macro economic variables association with stock market performance. The variables comprise of GDP, employments, Index of industrial production, inflation, interest rates, exchange rates and oil prices etc. The piece of work done in developed countries, emerging countries and underdeveloped countries. However, GDP is a broad indicator of entire economy of a particular country. In research studies, no study has explained GDP in relation to current prices or at constant prices where farmer is without adjustment of inflation where latter is adjustment of inflation. Keeping this in mind the researcher selected variables for

data analysis. Therefore, present study focuses on impact or effect of both variables on stock performance and investigates the results. The study answers which variable, GDP at current prices or constant prices is more reliable for the analysis.

Objectives of the study: Present study aimed at

- To examine the impact of GDP at current prices on NSE NIFTY
- To study the impact of GDP at constant prices on NSE NIFTY
- To analyze the impact of GDP at current prices on BSE SENSEX
- To measure the impact of GDP at constant prices on BSE SENSEX

RESEARCH METHODOLDOGY: Present study is purely based on secondary data collected from the stock exchange websites and RBI. In the present study GDP at current prices and at constants prices are selected as independent variables where as NSE NIFTY and BSE SENSEX as dependent variables. The study used regression analysis to understand correlation between dependent and independent variables and extent of effect of independent variable and dependent variables. The study period covers from 2016-2021. The study tries to find out how GDP variables affect in measuring exact and reliable results of stock market volatility. We have used SPSS for data analysis.

HYPOTHESIS: Present study examines the following alternative hypothesis where null hypothesis is implied.

H_1: There is significant relationship between GDP current prices and NIFTY

H_2: There is significant relationship between GDP constant prices and NIFTY

H_3: There is significant relationship between GDP current prices and SENSEX

H_4: There is significant relationship between GDP constant prices and SENSEX

TABLES AND FIGURES

Year	GDP Current Prices(Rs Cr)	GDP Constant Prices(Rs Cr)	NIFTY	SENSEX
2020-21	19745670.00	13512740.00	14690.75	58253.82
2019-20	20351013.00	14569268.00	8597.75	47253.74
2018-19	18886957.00	14003316.00	11623.90	41253.74
2017-18	17090042.00	13144582.00	10114.00	36068.33
2016-17	15391669.00	12308193.00	9173.75	34056.83
2015-16	13771874.00	11369493.00	7713.05	26626.46
2014-15	12467959.00	10527674.00	8491.00	26117.54
2013-14	11233522.00	9801370.00	6704.20	27499.42
2012-13	9944013.00	9213017.00	5682.55	21170.68
2011-12	8736329.00	8736329.00	5295.55	19426.71
Source: RBI, NSE and BSE				

REGRESSION RESULTS: SPSS Results:

Variables Entered /Removed

Model	Variables Entered	Variables Removed	Method
1	GDP CURRENT[b]	.	Enter
2	GDP CONSTANT		Enter

a. Dependent Variable: NIFTY and SENSEX b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.831[a]	.690	.651	1673.96092	.690	17.784	1	8	.003
2	.780	.608	.559	1881.69188	.608	12.405	1	8	.008
3	.927	.858	.841	4898.42896	.858	48.514	1	8	.000
4	.870	.757	.726	6423.47096	.757	24.865	1	8	.001

Predictors: (Constant), GDPCURRENT and GDP Constant

b. Dependent Variable: NIFTY (1,2) SENSEX (3,4)

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1. (Constant)	495.085	2041.218		.243	.814	-4211.973	5202.143
GDPCURRENT	.001	.000	.831	4.217	.003	.000	.001
2. (Constant)	-3574.909	3565.924	.780	-1.003	.345	-11797.946	4648.127
GDP CONSTANT	.001	.000		3.522	.008	.000	.002
3.(Constant)	-6407.734	5973.117	.927	-1.073	.315	-20181.765	7366.298
GDPCURRENT	.003	.000		6.965	.0000	.002	
4. (Constant)	-26075.49	12172.8881	.870	-2.142	.065	-54146.207	1995.222
GDPCONSTANT	.005	.001		4.986	.001	.003	.007

Dependent Variable: NIFTY(1,2) SENSEX (3,4)

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ANOVA							
	Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	49833610.737	1	49833610.737	17.784	.003[b]	a. Dependent Variable: NIFTY b. Predictors: (Constant), GDPCURRENT
	Residual	22417161.183	8	2802145.148			
	Total	72250771.920	9				
2	Regression	43924657.332	1	43924657.332	12.405	0.008	a. Dependent Variable: NIFTY b. Predictors: (Constant), GDPCONSTANT
	Residual	28326114.588	8	28326114.588			
	Total	72250771.920	9	72250771.920			
3	Regression	1164066032	1	1164066032	48.514	0.000	a.Dependent Variable: SENSEX b. Predictors: (Constant), GDPCURRENT
	Residual	191956850.4	8	23994606.30			
	Total	1356022882	9				
4	Regression	1025935048	1	1025935048	24.865	.001	a.Dependent Variable: SENSEX b. Predictors: (Constant), GDP CONSTANT
	Residual	330087833.8	8	41260979.23			
	Total	13560222882	9				
Independent variables: NIFTY (1,2) and SENSEX(3,4) Predictors: GDP Current Prices and Constant Prices							

The regression technique is used to explain variability in dependent variable by means of one or more of independent or control variables. There are four types of regression analysis such as explanatory, predictive, comparing and decision purpose. The equation for predication of dependent variables is $y = a + bxx$ is the value of the explanatory variable, $\boldsymbol{y}$ ("y-hat") is the predicted value of the response variable for a given value of x, b is the slope, the amount by which y changes for every one unit increase in x, a is the intercept, the value of y when x = 0.

In the present study dependent variables are NSE NIFTY and BSE SENSEX and independent variables comprises of GDP at current prices and GDP at constant prices. There study uses regression analysis to find out to what extent independent variables cause the variability in dependent variables for the selected period.

Model one discussed the relationship between GDP current prices and NSE NIFTY. In regression analysis result, R value is 0.831 which indicates strong positive correlation between dependent (NIFTY FIFTY) and independent variable (GDP current prices) during the study period. Similarly, adjusted R square witnessed that, .651 percent of variability in dependent variable is explained by the independent variable. The sign value .003 indicates that both dependent and independent variables have significant relationship. In co-efficient table, B value indicates that, 001 percent change in GDP current prices leads to one percent change in NSE NIFTY which indicates high sensitivity in nature. The fit line also supports the fitness of the regression test to the data.

Model two discussed the relationship between GDP at constant prices and NSE NIFTY. In regression analysis result, R value is .780 which indicates strong positive correlation between dependent (NIFTY FIFTY) and independent variable (GDP at constant prices) during the study period. Similarly, adjusted R square witnessed that, .559 percent of variability in dependent variable is explained by the independent variable. The sign value .008 indicates that both dependent and independent variables have significant relationship. In co-efficient table, B value indicates that, 001 percent change in GDP at constant prices leads to one percent change in NSE NIFTY which indicates high sensitivity in nature. The fit line also supports the fitness of the regression test to the data.

Model three discussed the relationship between GDP current prices and BSE SENSEX. In regression analysis result, R value is .927 which indicates strong positive correlation between dependent (BSE SENSEX) and independent variable (GDP current prices) during the study period. Similarly, adjusted R square witnessed that, .841 percent of variability in dependent variable is explained by the independent variable. The sign value .000 indicates that both dependent and independent variables have significant relationship. In co-efficient table, B value indicates that, 003 percent change in GDP current prices leads to one percent change in BSE SENSEX which indicates high sensitivity in nature. The fit line also supports the fitness of the regression test to the data.

Model four discussed the relationship between GDP at constant prices and BSE SENSEX. In regression analysis result, R value is .870 which indicates strong positive correlation between dependent (BSE SENSEX) and independent variable (GDP current prices) during the study period. Similarly, adjusted R square witnessed that, .726 percent of variability in dependent variable is explained by the independent variable. The sign value .001 indicates that both dependent and independent variables have significant relationship. In co-efficient table, B value indicates that, 005 percent change in GDP current prices leads to one percent change in BSE SENSEX which indicates high sensitivity in nature. The fit line also supports the fitness of the regression test to the data.

FINDINGS OF TH E STUDY:

The study found that significant positive effect of both independent variables on NIFTY during the study period. However, GDP at current prices has high reliable R value (.831) than GDP at constant prices (.780) and high determinant of variance (.690). The sign value of model one and two are less than .05 which indicates significance of relationship. Therefore, the study found that, both GDP at current prices and Constant prices variable are strong determinants of NIFTY performance during the study period, but, GDP at current prices results GDP current prices variable results are better indicators than GDP at constant

prices. In this case Hypothesis one and two i.e. alternative are accepted and null hypothesis are rejected.

The study also revealed significant positive effect of both independent variables on BSE SENSEX during the study period. However, GDP at current prices has high reliable R value (.927) than GDP at constant prices (.870) and high determinant of variance (.841). The sign value of model one and two are less than .05 which indicates significance of relationship. Therefore, the study found that, both GDP at current prices and Constant prices variable are strong determinants of SENSEX performance during the study period, but, GDP at current prices results GDP current prices variable results are more better than GDP constant prices. In this case Hypothesis one and two i.e. alternative are accepted and null hypothesis are rejected.

The study found that significant positive relationship effect of both independent variables on NIFTY during the study period. However, GDP at current prices has high reliable R value than GDP at constant prices

CONCLUSION: The study is aimed at the determination of GDP on stock market performance in India during 2016-2021.The study adopted regression analysis technique to find out the effect of GDP on NSE NIFTY and BSE SENSEX. The main objective of the study is not only finding the effect, besides, help the researchers in selection of one from two GDP variables such at current prices and at constant prices which excluded inflation effect. The statistical results support that both GDP current prices and constant prices have significant positive relationship with NIFTY and SENSEX indices during the study period. However, the results of GDP at current prices are more reliable than GDP at constant prices results. Therefore, the study suggests the research to consider GDP at current prices as input variables than GDP at constant prices. However, the study recommends that further research on this aspect both for short period and long period.

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