

Gauging the Effect of Select Macro Economic Variables on BSE 100 and Nifty50

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[Abstract] The present study contemplates the impact of GDP and GDP per capita on stock market prices of BSE100 and Nifty50. The study is entirely based on secondary data. By using correlation and multiple regression analysis, it is concluded that the GDP is the dominant independent variable of both BSE100 and Nifty50 with R^2 values of 85.1 percent and 83.6 percent, respectively. However, the GDP is an important factor for both the dependent variables; nevertheless, its influence on BSE100 has been more than on Nifty50, and the combined impact of both independent variables exposed more influence on NSE than BSE100.

[Keywords] macroeconomic, GDP, Nifty, BSE100, GDP per capita

Introduction

The stock market constitutes a substantial fragment in all economies' financial sectors. A well-organized capital market fuels economic growth by bringing together a plethora of funds indispensable for the country's economic progress. Stock values alter rapidly in a well-organized market in response to fresh figures. Stock values represent all accessible figures about equities, as well as predictions for forthcoming company performance. Accordingly, stock values must be regarded as a key indicator for activities in the economy if they represent these assumptions in the actual (Ray, 2012).

The capital market of India has undergone a run of fundamental modifications since 1991, owing to the effects of economic restructurings in the economy. Consequently, stock market has seen notable development; nevertheless, at the same time, it is categorized as the utmost impulsive stock marketplaces. Furthermore, the share markets in emergent nations, such as India, are expected to be subtle to various elements, such as ups and downs in the amount of activities of the economy, deviations in the governmental and global economic climate, and alterations in additional macro variables elements (Naik & Padhi, 2012).

In this regard a question arises: To what extent does the Indian stock market respond to the changes in macro variables? So, the present study attempts to analyze the impact of select macro variables on the Indian stock market.

Literature Review

Reddy (2012) in his research study analyzed the influence of GDP, interest proportion and inflation percentage on the share values of selected companies. The duration of the study was 1997 to 2009. Regression and correlation analysis have been used to examine the data. The results showed that explanatory variables accounted for 95.6 percent of the variations in the stock prices, and RGDP was the most significant variable influencing stock prices. Further, Bayar, Kaya, and Yildirim (2014) in their research study analyzed the correlation amid the development of the stock market and the growth of the economy in Turkey. The duration of the study was 1999 to 2003. The Johansen – co-integration Test and the Causality test by Granger, have been utilized to evaluate the data. The results revealed that there is a long-term relationship that exists amid economic growth and stock market capitalization.

Venkatraja (2014) examines the relationship between selected macroeconomic elements and Indian stock market for the period April 2010 to June 2014. The data was solely collected through secondary sources. Multiple regression was applied to evaluate the data. The findings revealed that more than 80

percent of the variation in stock market was due to the selected macroeconomic elements. Further, out of 5 selected variables, 4 shows significant positive impact on BSE expect Index for Industrial Production. Additionally, Kumar and Rathee (2015) in their research study analyzed the impact of balance of payment on the index of the NSE and BSE. By using correlation coefficient and multiple regression analysis, it is concluded that the current account is the dominant independent variable of the NSE; in addition, the effect of the capital account is more substantial in the case of the BSE.

Chavda and Kumar (2018) in their research examined the influence of GDP on the BSE index for the period of the last 10 financial years. Various analytical tools, like descriptive statistics, the Karl Pearson Coefficient, and regression analysis have been used to evaluate the data. The results revealed that there exists a direct association amid returns of the stock market and GDP. Also, Wofie and Ansah (2018) in their research observed the influence of the forex rate and inflation on yields of the stock market during the period Jan 2000 to Dec 2013. By using the auto-regressive distributed lag method of co-integration, it was concluded that the results exposed that there subsists a significant association among returns of the GSE market and inflation and short, as well as the long-term association between the GSE and inflation. Moreover, Raju, Manjunath and Kumar (2018) analyzes the impact of inflation and gross domestic product on Indian Stock Market for the last 10 years (quarterly data). Unit root test for stationary, Co-integration Test, Vector error correction model has been used to analyze the data. The results of the study highlighted that T statistics for inflation was in negative which depicts that as the inflation increases the Nifty returns decreases, but the T statistic for GDP is positive.

Methodology

Research methodology is the path through which the researchers need to conduct their research.

Research Objectives

The main research objectives are as follow:

To examine the influence of GDP and GDP per capita on the BSE100.

To examine the influence of GDP and GDP per capita on Nifty50.

Selection of Variables

Among numerous macro- variables, the present study is focused on two key macro- variables: GDP and GDP per capita and, at present, the two leading Indian stock exchanges are- Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). So, the present endeavor is focused on both stock exchanges.

Time period

It covers 10 fiscal years ranging from 2011 to 2020.

Data Collection

The present study is entirely based on secondary data. The required data associated with macro variables (GDP and GDP per capita) have been acquired from the official website of the World Bank and the data of the BSE100 and the Nifty50 have been assimilated from the website of the BSE and the NSE, respectively.

Hypotheses Testing

The research propositions are established based on review of literature and research objectives. The null propositions outlined are specified as follow: **HO1**: There exists no statistically significant influence of GDP and GDP per capita on the BSE100. **HO2**: There exists no statistically significant influence of GDP and GDP per capita on the Nifty50.

Analyses of Hypotheses

Coefficient of Correlation by Karl Pearson and multiple regression were applied to evaluate the data. “Correlation analysis deals with the association between two or more variables” Similarly, an attempt is made to assess the association of predictor variables – GDP and GDP per capita and outcome variables –

BSE100 and Nifty50 and multiple regression entails “Association between a criterion variable and two or more predictors variable”. Likewise, an effort is made to examine the influence of predictor variables--GDP and GDP per capita on dependent variables—the BSE100 and the Nifty50.

- a. Multiple regression analysis of independent variables on the BSE100.
- b. Multiple regression analysis of independent variables on the Nifty 50.

Independent Variables: GDP and GDP per capita

Dependent Variables: BSE100 and Nifty50

Tables 1A and 1B interpret the Pearson’s Correlation Coefficient. The results show that the correlation between the BSE and the GDP is .922 and the BSE and the GDP per capita is .897, whereas the correlation between the NSE and the GDP is .914 and the NSE and the GDP per capita is .887. The correlation coefficient in all cases is less than .05. This implies correlation coefficient between the BSE and the GDP, the BSE and the GDP per capita, the NSE and the GDP, the NSE and the GDP per capita is positive, high, and statically significant.

Table 1A

Pearson Correlation Coefficient

		Bombay Stock Exchange	GDP	GDP per capita
Correlation	Bombay Stock Exchange	1.000	.922	.897
	GDP	.922	1.000	.998
	GDP per capita	.897	.998	1.000
Sig. (1-tailed)	Bombay Stock Exchange	.	.000	.000
	GDP	.000	.	.000
	GDP per capita	.000	.000	.

Table 1B

Pearson Correlation Coefficient

		National Stock Exchange	GDP	GDP per capita
Correlation	National Stock Exchange	1.000	.914	.887
	GDP	.914	1.000	.998
	GDP per capita	.887	.998	1.000
Sig. (1-tailed)	National Stock Exchange	.	.000	.000
	GDP	.000	.	.000
	GDP per capita	.000	.000	.

In **Table 2A**, the R value in the table illustrates, while GDP was utilized as an independent variable, a high degree of association, .922 amid GDP and BSE100, was detected. The following column provides the R Square value. For the first model, .851 is the value, which means GDP accounts for 85.1 percent variation in the BSE100. Nevertheless, while another independent variable (GDP per capita) is incorporated, too, it increases the value to .962 or 96.2 percent. Therefore, if the GDP accounts for 85.1 percent variation. We conclude that GDP per capita represents an extra 11.1 percent change in the dependent variable.

Table 2B depicts R square value for the GDP and the NSE is .836, which demonstrates GDP represents 83.6 percent in the dependent variable, and, while another independent variable GDP per capita is incorporated, too, it increases the value to .965 or 96.5 percent, which implies the addition of GDP per capita represents an extra .129 (12.9 percent) of the change in the dependent variable.

Table 2A*Model Summary*

Model	Value of R	Value of R ²	Value of Adjusted R ²	Std. Error of the Estimate	Change Statistics				
					R ² Variation	F Variation	Value of df1	Value of df2	Sig. F Variation
1	.922 ^a	.851	.832	1240.34562	.851	45.642	1	8	.000
2	.981 ^b	.962	.952	665.04213	.112	20.828	1	7	.003

a. Independent Variables: (Constant), GDP

b. Independent Variables: (Constant), GDP, GDP per capita

c. Dependent Variable: BSE

Table 2B*Model Summary*

Model	Value of R	Value of R ²	Value of Adjusted R ²	Standard Error of the Estimate	Change Statistics				
					R ² Variation	F Variation	Value of df1	Value of df2	Sig. F Variation
1	.914 ^a	.836	.815	1271.52325	.836	40.742	1	8	.000
2	.982 ^b	.965	.955	628.53738	.129	25.740	1	7	.001

a. Independent Variables: (Constant), GDP

b. Independent Variables: (Constant), GDP, GDP per capita

c. Dependent Variable: NSE

Tables 3A and 3B demonstrate that in the BSE100, the values of the F-ratio for both models are 45.642 and 89.796, correspondingly. Likewise, in the NSE, the values of the F –ratio for both the models are 40.742and 96.237, correspondingly., which shows significance; However, the F –ratio value for the second model in both cases is greater than the other one. Accordingly, the second model is more noteworthy in forecasting the dependent variables i.e., BSE and NSE.

Table 3A*ANOVA*

Model		Sum of Squares	df	Mean Square	F Value	Sig.
1	Regression	70218822.033	1	70218822.033	45.642	.000 ^b
	Residual	12307658.062	8	1538457.258		
	Total	82526480.094	9			
2	Regression	79430512.849	2	39715256.424	89.796	.000 ^c
	Residual	3095967.245	7	442281.035		
	Total	82526480.094	9			

a. Dependent Variable: Bombay Stock Exchange

b. Independent Variables: (Constant), GDP

c. Independent Variables: (Constant), GDP, GDP per capita

Table 3B
ANOVA

	Model	Sum of Squares	df	Mean Square	F Value	Sig.
1	Regression	65870065.393	1	65870065.393	40.742	.000 ^b
	Residual	12934170.928	8	1616771.366		
	Total	78804236.321	9			
2	Regression	76038821.697	2	38019410.849	96.237	.000 ^c
	Residual	2765414.624	7	395059.232		
	Total	78804236.321	9			

- a. Dependent Variable: National Stock Exchange
 b. Independent Variables: (Constant), GDP
 c. Independent Variables: (Constant), GDP, GDP per capita

Tables 4A and 4B demonstrate unstandardized values that elucidate the influence of each independent variable on the dependent variable when other independent variables remain the same. A positive value represents a direct association between the independent and the dependent variables, a negative value represents an inverse relationship between the independent and the dependent variables.

- a. Gross Domestic Product (GDP): The unstandardized value for Model 2 in Table 4A is 43.281 and in Table 4B it is 44.905. These values specify that 4A, if the GDP increases by 1 unit (1 billion), the BSE increases by 43.281 and 4B NSE increases by 44.905 units. The above explanation is true when the influence of the GDP per capita is held constant.
- b. GDP per capita: The unstandardized value for Model 2 in Table 4A is -58.159, and 4B is -61.105. These values specify that in 4A, if the GDP per capita increases by 1 unit, the BSE decreases by 58.159 and in 4B the NSE decreases by 61.105 units. The above explanation is true when the influence of the GDP is held constant.

Tables 4A and 4B illustrate values of β , which explicates the amount of variation in S.D outcome in response to one S.D variation in the predictor.

- a. Gross Domestic Product (GDP): In 4A, the value of $(\beta) = 5.764$, and in 4B = 6.120. These values specify that if the GDP increases by 1 Standard Deviation, the BSE increases by 5.764 and the NSE increases by 6.120. The above explanation is factual when the influence of the GDP per capita holds constant.
- b. Gross Domestic Product per capita (GDP per capita): In 4A the value of $(\beta) = -4.853$, and in 4B = -5.218. These values specify that if the GDP per capita increases by 1 Standard Deviation, the BSE decreases by 4.853 and the NSE decreases by 5.218. The above explanation is factual when the influence of the GDP holds constant.

Table 4A

Coefficients

	Model	Value		Value of t	Sig.
		B	Std. Error		
1	(Constant)	-6758.015	2369.338	-2.852	.021
	GDP	6.927	1.025	.922	.000
2	(Constant)	10668.112	4024.173	2.651	.033
	GDP	43.281	7.985	5.764	.001
	GDP per capita	-58.159	12.744	-4.853	.003

Dependent Variable: Bombay Stock Exchange

Table 4B
Coefficients

	Model	Value		Value of t	Sig.	
		B	Std. Error			
1	(Constant)	-6410.368	2428.894	-2.639	.030	
	GDP	6.709	1.051			.914
2	(Constant)	11898.653	3803.283	3.129	.017	
	GDP	44.905	7.547	6.120	5.950	.001
	GDP per capita	-61.105	12.044	-5.218	-5.073	.001

Dependent Variable: National Stock Exchange

In Table 4A, the value of “p” related to the GDP is .001, and GDP per capita is .003, which is less than .050. So, the supposition of the ***H01: There exists no statistically significant influence of the GDP and the GDP per capita on the BSE100*** is not accepted. Hence, it is inferred that GDP and GDP per capita are significantly influencing the BSE100.

in Table 4B, the value of “p” related to the GDP is .001, and GDP per capita is .001, which is less than .050. So, the supposition of the ***H02: There exists no statistically significant influence of GDP and GDP per capita on the Nifty50***, is not accepted. Hence, it is inferred that the GDP and the GDP per capita are significantly influencing the Nifty50.

Conclusion

The analysis indicates that GDP is the dominant independent variable of both the BSE100 and the Nifty50 with R² values of 85.1 percent and 83.6 percent, respectively. However, the GDP is an important factor for both the dependent variables; nevertheless, its influence on the BSE100 is more than the Nifty50, and the combined impact of both independent variables together exposes more influence on the NSE (R square=96.5 percent) than on the BSE100. In addition, results show that if both the independent variables remain constant, then there are further factors that explicate the BSE100 and the Nifty50 equal to 10668.112 and 11898.653 units.

Contribution

Based on above interpretation, it is concluded that the findings of this research unearth novel statistics that amend the projections of policymakers, academicians, stakeholders, etc. to apprehend, as well as practice, to keep variety and stability in fiscal intermediation.

Future Research

This study opens a pathway for further research relating to this area. Other macroeconomics variables (like the balance of payment, gold prices, crude oil, exchange rate, etc.) and their impact on the stock market can be considered for further research and development.

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