

Impact of Gross Domestic Production on Nifty50 Index - A Study

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Abstract

The stock market is a place where the shares are buying and selling or exchange to each other between two parties. The stock market is a barometer to test health of the Indian economy. And the stock market influenced by the various macroeconomic factors like, inflation, unemployment rate, index of industrial production, foreign exchange reserves, exchange rate, gross domestic production, monetary policy key rates, global events, company results and market sentiments. In the way, among the various macroeconomic factors the Gross Domestic Production is a major determining factor on Indian stock market and also it is major tool of Reserve Bank of India to control the Indian economy. Whether there is exists any relationship between Gross Domestic Production and Nifty Index and any directional effect as well. Therefore the study examined that there is a relationship between Gross Domestic Production and Nifty Index. Hence, also found that there is unidirectional causal effect to Nifty Index from Gross Domestic Production. The statistical tools were used for this empirical study Augmented Dicky Fuller test, Johenson Co-integration test and Granger Causality test. This study helps to Individual investors, fund managers, stock brokers, Institutional investors, retail investors and Mutual fund institutions etc.

Keywords: GDP, Nifty, ADF test, Co-integration and Causality test

I. Introduction

The stock market is a place where the shares are buying and selling or exchange to each other between two parties. The stock market is a barometer to test health of the Indian economy. And the stock market influenced by the various macroeconomic factors like, inflation, unemployment rate, index of industrial production, foreign exchange reserves,

exchange rate, gross domestic production, monetary policy key rates, global events, company results and market sentiments. In the way, among the various macroeconomic factors the Gross Domestic Production is a major determining factor on Indian stock market and also it is major tool of Reserve Bank of India to control the Indian economy. In Indian economy, when the employment opportunities increase then, more income will increase when the more income available there is boost of more consumption it leads to the more production these results affect the Indian stock market as well.

II. Objectives of the study

Objectives of the study are:

- To examine the relationship between Gross Domestic Production and Nifty.
- To analyze the causal effect between Gross Domestic Production and Nifty.

III. Purpose of the Study

The purpose of the present study is to help the investors to take right decision at the time of investment. This study helps the retail investors, stock broking firms, fund managers, financial institutions, foreign institutional investors, investment bankers and foreign institutional investors in taking right decisions and increases their return on investment.

IV. Hypotheses

Hypotheses designed for the study are:

H₀₁: There is no relationship between Gross Domestic Production and Nifty.

H₀₂: There is no causal effect between Gross Domestic Production and Nifty.

V. Literature Review

Ch. Sanjeev and K. Aparna (2018) studied that the effect of inflation on CNX Nifty movement and observed that there is an effect of inflation on CNX Nifty index. Multi regression model proved that there is no inflation effect on CNX Nifty index. Further, evidenced that inflation has influenced highly the Sensex than the CNX Nifty.

Ch. Sanjeev and K. Aparna (2018) found that the select macroeconomic factors such as Gross Domestic Product, Production Manufacturer's Index, Index of industrial Production, and inflation have influenced Nifty index.

K. Malarvizhi et.al (2012) evidenced that there is co-integration between Gross Domestic Production and Nifty index and also found that there is bidirectional causal relationship between Gross Domestic Production and Nifty.

Lokeshwar Reddy (2012) analyzed that impact of inflation and GDP on stock market returns in India found that when reducing the inflation and interest rates resulting the stock prices are increased. Hence, investigated that RGDP influenced positively on stock market returns.

VI. Methodology

The present study has been done based on secondary data i.e., time series. Period of the study commenced from 1st January, 2015 to 31st December, 2019. The following statistical tools are used in the study:

Augmented Dickey fuller test: This test is used for a unit root in a time series. It is applied for a larger and more complicated set of time series models.

Johnson Co-integration test: This test has been applied to know the co integration between the two variables.

Granger Causality test: This test has been used to check directional movements between two variables.

In this study the data related to Gross Domestic Production is obtained from the data base of Reserve Bank of India and Nifty related data collected is from website i.e. nseindia.com. In this study quarterly data is used. The Augmented Dickey Fuller (ADF) unit root test conducted to convert the data to stationary. The Gross Domestic Production and Nifty both were converted from non-stationary to stationary at first difference.

VII. Analysis and Inferences

Table.1-Augmented Dicky Fuller Test- At First Difference of GDP

			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.20281	0.0402
Test critical values:	1% level		-3.95915	
	5% level		-3.081	
	10% level		-2.68133	

Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(GDP,2)				
Method: Least Squares				
Date: 02/07/20 Time: 06:59				
Sample (adjusted): 2016Q2 2019Q4				
Included observations: 15 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-1.14899	0.358744	-3.20281	0.0094
D(GDP(-1),2)	0.008235	0.286534	0.028741	0.9776
D(GDP(-2),2)	-0.47738	0.1522	-3.13649	0.0106
D(GDP(-3),2)	-0.41037	0.103909	-3.9493	0.0027
C	0.015632	0.006864	2.277561	0.046

The above table depicts that the data of Gross Domestic Production became non stationary to stationary at first difference under Augmented Dicky Fuller test.

Table.2- Augmented Dicky Fuller Test- At First Difference of Nifty

		t-Statistic	Prob.*	
Augmented Dickey-Fuller test statistic		-3.51257	0.0208	
Test critical values:	1% level	-3.88675		
	5% level	-3.05217		
	10% level	-2.66659		
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NIFTY(-1))	-1.346963	0.383469	-3.51257	0.0034
D(NIFTY(-1),2)	0.128788	0.264946	0.48609	0.6344
C	0.029017	0.014576	1.990808	0.0664

The above table describes that the data of Nifty became non stationary to stationary at first difference under Augmented Dicky Fuller test.

1st Objective: To examine the relationship between GDP and Nifty

Series: DNIFTY DGDP				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.810202	42.19031	15.49471	0
At most 1 *	0.559564	13.93983	3.841466	0.0002
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
		Max-Eigen	0.05	
Hypothesized				
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.810202	28.25048	14.2646	0.0002
At most 1 *	0.559564	13.93983	3.841466	0.0002
Unrestricted Cointegrating Coefficients (normalized by b'S11*b=I):				
DNIFTY	DGDP			
17.2618	74.76509			
24.9856	-31.68263			
Unrestricted Adjustment Coefficients (alpha):				
D(DNIFTY)	-0.045851	-0.02885		
D(DGDP)	-0.016072	0.005358		
		Log likelihood	82.42644	
1 Cointegrating Equation(s):				
Normalized cointegrating coefficients (standard error in parentheses)				
DNIFTY	DGDP			
1	4.331245			

	-0.61841			
Adjustment coefficients (standard error in parentheses)				
D(DNIFTY)	-0.791463			
	-0.21304			
D(DGDP)	-0.27743			

Source: *Calculated Based on Secondary data*

The above table depicts the equation of co-integration between Gross Domestic Production and Nifty. The result from the trace test indicates that the value of trace statistics is higher than the critical value (i.e., $42.19 > 15.494$) which means that Nifty is co-integrated with Gross Domestic Production. And other side, Max-Eigen value also indicates same Max Eigen value higher than the critical value (i.e., $28.25 > 14.26$). Therefore, Gross Domestic Production co-integrated with Nifty.

2nd Objective: To analyze the Causal effect of GDP on Nifty Index

Pairwise Granger Causality Tests			
Date: 02/07/20 Time: 07:19			
Sample: 2015Q1 2019Q4			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
DGDP does not Granger Cause DNIFTY	17	6.20586	0.0141
DNIFTY does not Granger Cause DGDP		3.25666	0.0742

Source: *Calculated Based on Secondary data*

From the above table it is observed that Gross Domestic Production granger caused to Nifty. Gross Domestic Production to Nifty shows significant i.e. p-value is less than 0.05; it means that Gross Domestic Production is granger caused to Nifty. Whereas, Nifty to Gross Domestic Production shows insignificant i.e. p-value is more than 0.05, it means that the Nifty is not directional effect to Gross Domestic Production. Therefore we cannot reject the null hypothesis i.e., Gross Domestic Production is not granger caused to Nifty but Nifty granger caused to Gross Domestic Production.

VIII. Conclusion

The study observed that following outcomes, under

1. The johenson co-integration test found that there is co-integration between Gross Domestic Production and Nifty Index.
2. Hence, the granger causality test it is found that Nifty index not granger caused to Gross Domestic Production but Gross Domestic Production granger caused Nifty.

From the study it can be concluded that there is a co-integration between Gross Domestic Production and Nifty. The study found that there is a unidirectional causal effect of Gross Domestic Production to Nifty Index

Limitations

- i. This study has been focused only on Gross Domestic Production variable to test the co integration between Gross Domestic Production and Nifty index, and other macro variables also may influence the Nifty index.
- ii. The study is confined only to five years quarterly time series data.

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