

***IMPACT OF GROSS DOMESTIC PRODUCT
ON INDIAN STOCK MARKET- AN EMPIRICAL STUDY***

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Abstract

Stock market is considered as the barometer for the economic health of any country. The various phases of business and economic cycle are also reflected in the movement of stock market index. The epoch making changes in the stock market substantiates the relationship between the economic factors of a country and stock market movement. Thus the movement of macroeconomic factors plays an imperative role in influencing the movement of any stock market index. Among many macroeconomic factors, the movement of GDP plays a crucial role. The **Gross Domestic Product** reflects a consolidated report of the performance of the Indian economy. The ongoing changes in the Indian stock market and changes in the GDP in the last decade lead to many empirical studies. This paper employs quarterly data from June 2000 to March 2010 to study the relationship between the NIFTY Index and GDP. The cointegration and Pairwise granger causality test surfaces the fact that there is a bidirectional causal relationship between GDP and NIFTY, i.e. changes in stock market will affect GDP and vice versa. Government and policy makers should give importance to this bi-directional causal relationship while framing policies.

Keywords: Stock Market, GDP, NIFTY Index, Cointegration Test, Granger Causality test

INTRODUCTION

Stock market is considered as the barometer for the economic health of any country. The various phases of business and economic cycle are also reflected in the movement of stock market index. The epoch making changes in the stock market substantiates the relationship between the economic factors of a country and stock market movement. Thus the movement of macroeconomic factors plays a vital role in influencing the movement of any stock market index. Among many macroeconomic factors, the movement of GDP plays a crucial role. The **Gross Domestic Product** reflects a consolidated report of the performance of the Indian economy. Globalization, Liberalization and Privatization opened up our country to the global environment

which facilitates entry of private investments and multinational competition into the Indian market. Indian economy transforms due to these inevitable changes.

Investment in the stock market aims at risk diversification and direct participation in project financing in a widespread manner which requires the existence of a relatively large number of investors with the erudition, means and ability to shoulder such risks. The boom and depression of the capital market is reflected in all sectors of the economy. The ongoing changes in the Indian stock market and changes in the GDP in the last decade lead to many empirical studies. This paper employs quarterly data from June 2000 to March 2010 to study the relationship between the NIFTY index and GDP.

The downward Stock price movement continuously in the market of any country forewarns the crisis period in advance. Numerous studies were conducted to trace the movement of stock market and its relationship with various economic factors. This study analyses the relationship between NIFTY Index and GDP.

CNX NIFTY Index of NSE has been taken to compare the stock market movement with GDP. This Index is a well diversified one, which represents fifty companies covering the all major industries of the economy.

This study consists of five sections. It starts with introduction of the study followed by review of literature. The third section deals with the objectives and statement of the problem, fourth is hypothesis of the study. The last section discusses the data analysis, interpretations and conclusions.

REVIEW OF LITERATURE

Boubakari Ake and Rachelle Wouono Ognaligui (2010) investigated the relationship between Doula Stock Exchange's Market Capitalisation and Cameroonian economic growth through GDP evaluation using quarterly time series data from 2006 to 2010. The study applied Granger's causality test to find out the link between variable Market Capitalisation and GDP. Using variance decomposition test of Cholesky, it was found out that there was systematic evidence that the market capitalization affected positively the GDP. The analysis provided an opportunity for the Cameroonian Government to fine tune financial policies, to encourage growth of companies and develop financial stock market culture.

Naresh kumar (2010) examined the nature of relationship between macroeconomic indicators and growth through capital accumulation in India. The study also attempted to investigate the pattern of market capitalisation, GDP growth and domestic saving to understand the future direction of the stock market. The study employed mathematical growth function namely Gompertz model to analyse estimation of financial variables and to establish link between these variables, assuming that financial variables were inter-related, Pearson correlation method was used. The results predicted a positive growth of market capitalisation for another five year period and positive association between macro indicators.

Mustafa, K et al. (2007) have done a study to investigate the empirical relationship between the stock market and real economy in Pakistan economy by taking up various variables like per capita GDP, output growth to represent the Real economy and stock market liquidity, size of stock market representing the Stock Market. Cointegration and Error Correction Model Technique has been adopted to establish the empirical relation, if any between the two from the time period 1980-2004. The estimated results indicate that stock market movements explain the per capita GDP and output growth in Pakistan in short run only, whereas economic growth

variables explain stock market variables both in short run as well as long run which implies that the growth of stock market depends on the overall growth of the economy in Pakistan. In their conclusion, they have also mentioned that their empirical findings infer that the stock market in Pakistan needs to develop further to play its due role in the economy in line with other financial institutions.

Ashiwini K. Tripathi and Ramanathan A (2005) investigates the causal linkage between trade variables with select macro economic variables (GDP, Investment and Capital Productivity). To find out the Causality of the variables, VAR and Cointegration analysis was applied. The study found that the trade has positive impact on investment, productivity and growth.

STATEMENT OF THE PROBLEM

Unravel Movement of the stock market index is highly fluctuating due to numerous macro economic factors. There is an necessity to predict the movement of stock market movement both for the investors and policy makers to make their investment and policy decision. The vital macroeconomic factor GDP and its relationship with the NIFTY Index will throw light for the investors and policy makers in their analysis. Hence this study unravels this research problem.

OBJECTIVES OF THE STUDY

- To examine the relationship between GDP and NIFTY Index movement of NSE.
- To analyze the causal relationship between the above two variables.

HYPOTHESIS OF THE STUDY

- ❧ GDP has no significant impact on the share price movement in Indian stock market.
- ❧ Nifty Index of Indian Stock Market does not predict the movement of GDP.

DATA AND METHODOLOGY

The study mainly uses the secondary data for the purpose of the analysis. The information regarding GDP and the value of S&P CNX NIFTY Index were obtained from the Reserve Bank of India and nseindia website for period from April 2000 to March 2010 on a quarterly basis. The time series analysis are utilized to analyse the long term and causal relationship between the variables. The time series analysis like Unit root test, Johansen's cointegration test and Granger causality test are applied in the study.

UNIT ROOT TEST

The time series variables considered in this paper are the Nifty Index and GDP. In order to avoid a spurious regression situation the variables in a regression model must be stationary or cointegrated. Therefore, in the first step, unit root tests performed to investigate whether they are stationary or not.

The Augmented Dickey-Fuller (ADF) unit root test is used for this purpose. The ADF regression equations are:

First Order

$$Y_t = Y_{t-1} + U_t \quad \text{----- 1}$$

Trend and constant

$$\Delta Y_t = \delta Y_{t-1} + \beta_1 t + \beta_2 + \varepsilon_t \quad \text{----- 2}$$

For Levels



$$\Delta Y_t = \lambda Y_{t-1} + \sum_{i=1}^p \mu_i \Delta Y_{t-1} + \eta t + \delta + \varepsilon_t \text{-----} 3$$

For first differences

$$\Delta \Delta Y_t = \lambda \Delta Y_{t-1} + \sum_{i=1}^p \mu_i \Delta \Delta Y_{t-1} + \delta + \eta t + \varepsilon_t \text{-----} 4$$

COINTEGRATION TEST

This test is used to provide a formal background for testing and estimating long run relationship between NIFTY Index and GDP. To apply this test if two variables are considered as stochastic trends and they follow a common long run equilibrium relationship then they should be integrated. There are two series, say X and Y are integrated of order one and cointegrated then there is possibility of a causal relationship in at least one direction. This test will indicate the presence or absence of causality but it does not indicate the direction of causality. To find out the causality Granger causality test is applied. Cointegration can occur among different time series integrated of the same order or when the different series move together towards an equilibrium relation. If the series are integrated of order one, Johansen’s procedure should be used to determine whether any cointegrating vector among variables exists or not. In this procedure, trace (λ trace) and maximum eigenvalue (λ max) statistics are computed, proposed by Johansen (1988) and Johansen and Juselius (1990).

GRANGER CAUSALITY TEST

Granger causality is a technique for determining whether one time series is useful in forecasting another. Ordinarily, regressions reflect "mere" correlations. A time series X is said to Granger-cause Y if it can be shown, usually through a series of F-tests on lagged values of X (and with lagged values of Y also known), that those X values provide statistically significant information on future values of Y.

ANALYSIS AND INTERPRETATIONS

Table 1
Augmented Dickey Fuller Test for stationarity of variables

Variable	Without trend		With trend	
	Levels	1st Difference	Levels	1st Difference
NIFTY	3.9047	- 6.1829	- 3.2571	- 5.1689
GDP	0.7536	-4.8554	-1.7734	- 5.7899

In order to investigate the stationarity properties of the data, a univariate analysis of each of the time series was carried out by testing for the present of unit root. Augmented Dickey Fuller (ADF) tests (Dickey & Fuller 1979), for the time series of the individual data and their first differences are estimated and presented in Table 1. Moreover both the models with and without trend are tested. The results in the table indicate that all the series are non-stationarity at their level. The critical values at 5% level of significance for ADF test under intercept and both

(i.e. intercept and constant) are -2.89678 and -3.46487 respectively. They become stationary after employing difference operator of degree one. That is, these series are integrated of order one I(1).

Table 2
Cointegration Test Between Nifty Index and GDP

Test assumption: Linear deterministic trend in the data.

Lag interval; No Lags (one lag in levels)

Eigen values	Likelihood Ratio (L.R.)	5% Critic value	1% Critic value	Hypothesized no CE(s)
0.240768	19.20961	15.49	20.04	None
0.019352	0.742597	3.84	6.65	At most 1

Source: Computed from secondary data

Cointegration test shows that the assumption of no Cointegration between Nifty and GDP is rejected at five percent significance level. It indicates that in the long run these variable moves together hence these variables can be tested for the presence of causality using Granger causality test. Hence there is long term comovement between Nifty and GDP and these variables are tested for the presence of causality to find out the direction of influence between the variables by applying Granger causality test.

Normalized Cointegration coefficients: I Cointegrating Equation

NIFTY	GDP	C
1	-3.270372	-621.561
Log likely hood	-0.57117	

Sources: Computed from data on variable specified

The above cointegration relation can be expressed as

$$\text{NIFTY} = -3.270372 \text{ GDP} - 621.561$$

Table - 3

Pairwise Granger Causality Test for NIFTY Index and GDP

Sample: April 2000- March 2010

Lags: 1

Null Hypothesis	Observations	F-Statistic	Prob.	Decision
GDP does not Granger Cause NIFTY Index	35	2.15324	0.0934	Rejected
NIFTY Index does not Granger Cause GDP		1.94291	0.7419	Rejected

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Source: computed from secondary data

Table 3 depicts the result of granger causality test. The first null hypothesis that GDP does not granger cause Nifty movement has been rejected as the F statistic value is less than the table value, which implies that GDP granger causes Nifty movement. In the same way the second hypothesis Nifty does not granger cause GDP movement is also rejected implying that GDP causes Nifty movement. This clearly gives a bi-directional relationship between them. Any changes in Nifty will influence the GDP and the vice versa is also true.

LIMITATIONS OF THE STUDY

- ❖ Only one macroeconomic factor has been taken for the study.
- ❖ Only ten years monthly data has been taken for the analysis.

CONCLUSION

The study focused on analyzing the long term dynamic relationship between the GDP and Nifty index. The result shows very clearly there is cointegration between the Nifty and GDP. Then the Pairwise Granger causality test for the study period April 2000 to March 2010 is performed as the next step. Granger causality test is used to test the hypothesis of the study and found out that the null hypothesis is rejected.

The result found out that there is a bidirectional causal relationship between GDP and nifty, i.e. changes in stock market will affect GDP and vice versa. Government and policy makers should give importance to this bi-directional causal relationship while framing policies.

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