

Impact of Macroeconomic Variables on Performance of Nifty in Indian Stock Market

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Article Info

Volume 83

Page Number: 9404 - 9413

Publication Issue:

March - April 2020

Abstract

The economic stability of a country is being measured by different macroeconomic variables and these reflect the economic condition of a country which in turn affects the industry scenario as well which affects the company activity. The Indian stock market plays a very vital role in the Indian Economy and it helps in the investment diversification. The macroeconomic factors are the measure indicators in the stock market movement and it is necessary to understand the impact of the macroeconomic variables. Seven macroeconomic independent variables are considered in this study are Import, Export, Net Fiscal Deficit (Government), Interest Rate (Prime Lending Rate), Revenue Receipt(Government), Gross Domestic Product(GDP), and Money Supply. Nifty is taken as the dependent variable. The data was collected from the RBI website over the period 2001 to 2018. Multiple Regression analysis is applied in the study to show the relationship, between macroeconomic variables and the Nifty. The study indicates significant relationship exists between the macroeconomic variable and the Nifty in India

Article History

Article Received: 24 July 2019

Revised: 12 September 2019

Accepted: 15 February 2020

Publication: 09 April 2020

Keywords; Macroeconomic Indicators, Nifty, Import, Export, GDP

I. INTRODUCTION

There has been a common believe that in recent years there is upsurge in international capital flows globally. Specifically in developing countries such phenomenon has created lot of opportunities towards the economic benefit and has created lot of challenges for decision makers. Deregulation and financial market globalization are acting as the major factors in the last few decades towards mobilization of capital at a cross country basis. Financial system of a country depends on its prevailing economic condition. Such economic development enhances making necessary changes in the financial market, instruments and institutions.

In the early 1990s financial sector reforms was originated and a country like India some market oriented change s were implemented. In form of

foreign portfolio investments and foreign direct investments foreign capital flows to Indian economy at an increasing rate. Capital market helps companies in raising additional capital, enhances their liquidity and interact them with public. Stock market development changed the behavior of corporate in their financing pattern i.e., they were more dependent on bank loans than equity capital.

A country's economic and financial condition can be better explained by its prevailing stock market performance. It is already accepted that Indian economy and its financial market both move in the same direction and expected to grow. Since 19th century an immense body of theoretical research and empirical analysis focus on the dynamic relationship of stock market development and macroeconomic fundamentals. It is already known that in developing prosperity, sustenance of economic growth and

capital formation of an economy is highly dependent on stock market development of a country.

II. LITERATURE REVIEW

Bhuiyan, E., et al (2019) examined the relationship in between macroeconomic variables and the indices of different sectors in US and Canada. The study used cointegration and VECM model for identifying the existence of long term relationship among the variables. The findings revealed that out of all the macroeconomic variables used in the study interest rate negatively influencing stock returns where as money supply is positively associated with stock indices. Moreover US monetary policy has influenced the Canadian Stock returns and its impact could not long last after the 2008 recession. Camilleri, S. J., et al (2019) used monthly data of 18 years of Germany, Netherland, France, Portugal and Belgium in order to study the connections in between economic fundamentals and stock returns. Over different sub periods by using VAR auto regression the evaluation was made. The outcome of the research shows that stock prices was leading inflation in all the selected five countries and it also leads industrial production across four countries and surprisingly all such relationship was positive in nature. It was also found that in Portugal, Germany and in France interest rate and money supply was acting as a leading indicator towards the movement of stock indices. SlahBahloul, S., et al (2017) collected data for twelve years starting from 2002 to 2014 and used Markov switching regression model and vector autoregressions model to measure the impact of macroeconomic determinants and conventional stock return volatility on twenty emerging and developed Islamic stock markets. Under both the regimes of high and low volatility it was found that money supply has influenced both the emerging and developed stock indices. Except conventional stock indices volatility and money supply it was not evident that any other macroeconomic variables could influence the dynamic Islamic stock market returns. Abbas, G., et al (2019) used the data from 1995 to 2015 and

employed spillover index approach within the framework of vector auto regression to measure the interrelationship in between stock market volatility and stock indices returns with the determinants of macroeconomic in China. The study found that the volatility impact to macroeconomic variables was comparatively stronger than stock returns. It was also suggested by the author that the investors who are always concerned towards volatility nexus with stock returns will definitely get a strong insight into it. Pradhan, R. P., et al (2015) analysed the linkages in between five macroeconomic variables like oil prices, real rate of interest, economic growth, inflation rate, real effective exchange rate with the depth of stock market in G-20 countries. For such analysis the data were collected from 1961 to 2012. To check the Granger causality among the variables the vector auto regressive model was used over the selected panel data. The study revealed that there was existence of long run relationship among all the variables during the study period. In measuring the stock market depth it was evident that real economic growth has quickly responded to any deviations made in the depth of stock market. The short run causality test was found very complex during the entire term of analysis. Though the study has concluded with a beautiful remark that the real economic growth responds to all types of measures to the depth of stock market simultaneously by allowing other macroeconomic variables. Pradhan, R.P., et al (2014) collected the data in relation to economic growth, stock market development, banking sector development of the ASEAN countries from 1961 to 2012. The analysis has revealed that there was presence of both bidirectional and unidirectional causality among the variables. It was suggested that there was need of nurturing stock market development and making the banking practices more accessible in few countries whodonot have sufficient bank accounts. Such policy recommendations will definitely facilitate in raising more capital to the economy. Shiu-Sheng Chen, S.,(2009) examined the importance of macroeconomic variables in predicting the behavior

of stock market during a particular time period. Basically the recession i.e., bear trend in the stock market and its forecasting was his single motto of writing this paper. The study has considered aggregate output, nominal exchange rate, inflation rate, unemployment rate, interest rate spread, money stock, federal funds rates, and federal government debt as the proxy of macroeconomic variables during the study period. By implementing both non parametric and parametric measures during the study period the different recession periods were identified in the stock market. Out of the empirical analysis the study has revealed that the bear trend in the stock market can be predicted by using inflation rate and yield curve spread well. It was also referred that recession trend in the stock market can be predicted better than stock returns by using macroeconomic variables. Pierdzioch, C., et al (2008) used the data of eleven years i.e., from 1994 to 2005 of real macroeconomic variables and its revised values for measuring its impact on stock market volatility in Germany. The volatility prediction was evaluated by using option based and utility based statistical criterion. The findings of the study has revealed there was presence of a factor i.e., comparability in between revised macroeconomic variables and tear time variables in the prediction of stock market volatility during the study period. Kwon, C. S., et al (1999) examined whether macroeconomic variables can reflect the stock market returns in Korea. For analysis data were collected on exchange rate, money supply, the production index, trade balance and were evaluated by using cointegration test and the Granger causality test. The results of the cointegration test have revealed that there was existence of long run relationship among the variables which implies macroeconomic variables can explain the stock price indices in the Korean stock market. The study suggested that as the behavior of stock market is highly fluctuating it cannot give any rational signal for macroeconomic variables as a leading indicator. Wei, Y., et al (2019) examined the connection in between the China stock market and crude oil price

mechanism in long run basis. Domestic economic development, foreign exchange market and foreign trade volume were used as the key macroeconomic fundamentals to evaluate whether their functions can act as a transforming channel in the model. Within a multivariate framework by using long term co integration it was found that both crude oil price and China stock market were cointegrated in the long run along with at the initial stage it was also observed that oil futures market has significantly influenced the stock market in China. Over the years their inter connection has dramatically changed at different regimes. It was evident that after the financial crisis in China basically exchange rate market has influenced the mechanism of crude oil prices and eventually the China stock market. Paye, B. S., (2012), examined the role of macroeconomic variables in explaining the volatility in stock returns. The variables related to macroeconomic, credit terms and expected stock prices on time variations granger causes volatility in the stock market. The study faced difficulties in finding the evidence which can exploit macroeconomic variables out of the sample at a univariate benchmark period. In indentifying different recession period and the overall predictive power of macroeconomic variables could long last for a short regime. Naifar, N., et al (2013) examined the relationship in between Gulf Cooperation Council (GCC) countries and oil price volatility. During the study period by using Markov switching models the research was carried over two regimes i.e., before crisis and after crisis regimes. The study found that the relationship is dependent on different regimes in between the OPEC oil market and the GCC stock market. An asymmetric dependence structure was visible in between oil price and and the rate of inflation where as a symmetric dependence structure was found in between short term interest rate and crude oil price during the last financial crisis period. Liu, J.,et al (2019) proposed a methodology for identifying the macroeconomic variables which can influence the changing direction of excess stock returns. It was basically emphasized for oil and gas stock index.

The objective behind developing such model was also to reduce the risk inherent in trading to the participants in the stock market by using information criteria and the forward sequential variable selection algorithm. The study ends with the findings of the changing direction of excess stock returns were more influenced by the real personal income of the participants. Cheema. M et al (2019) investigated and tried to develop a dynamic relationship in between the anomalies present in stock market of china being positioned top for importing oil and the prevailing crude oil prices. The study hypothesized that there is a positive relationship in between demand for oil and crude oil prices, means when oil price increases its demand for oil also increases. It leads to rising in stock prices. The study revealed that anomalous stock returns are higher in case of rising oil prices than falling oil prices. Mispricing was possible in China with the presence of aggregate instead of individual anomalies. Wongbangpo, P.,et al (2002) examined to find out the fundamental connection in between macroeconomic determinants and ASEAN stock market. Here five ASEAN countries selected were Philippines, Thailand, Indonesia, Singapore and Malaysia to measure the inter linkage in between economic variables and stock prices. Moreover Gross National Product, interest rate, money supply in these countries in the granger sense both caused by and cause stock prices during the research phenomenon. It was suggested by the author as in the long and short run these variables interacted with stock prices decent financial norms can create impressive excess returns in both the fields. Chowdhury, A., et al (2018) investigated the impact of fiscal and monetary policy variables on the stock market liquidity of emerging markets in Asia. The study started with an assumption that for determining market liquidity always Fiscal policies and central bank plays an important role. In the emerging markets any change in Government expenditure and money supply can significantly affects overall market liquidity position. So that here a proper balance need to be maintained in between

high excess return and liquidity cost involved with it. It was also found that interest rate, public borrowings and bank rate has also affected illiquidity in the stock market. Beltratti, A., et al (2006) studied the relationship in between stock market volatility and macroeconomic determinants by using the data of thirty years. It was evident that there was an association ship in between the rate of money supply and federal fund growth rate with stock return volatility. A stronger causality movement was found from economic fundamentals towards volatility of stock market. Two memorable factors like volatility of inflation and output were the driving factor for volatility series of stock market. Salisu, A. et al (2019) developed a forecasting model for predicting the movement of oil company's stock prices by the influencing power of macroeconomic fundamentals. It was suggested that for high frequency time series data it is better to run a pre test on the predictors for measuring heteroscedasticity. The effectiveness of the forecast model was also improved with the initiation of structural breaks. In US stock market the forecast model found suitable for analyzing the effectiveness in various hedging techniques. Dimic, N., et al (2016) examined the dynamic relationship in between stock and bond both in short as well as in long term phenomenon. The study used wevelet approach to analyse such relationship in ten emerging markets. It was found that in short run the bond-stock correlation was mostly influenced by monetary policy, where as in long run uncertainty associated with stock market and rate of inflation affected the correlation at most. It was concluded with a narrative line that in comparison to global bond market uncertainty lies with stock market plays an important role in better exhibiting the bond stock correlations in those selected countries over the research phenomenon. Ulku, N.,et al (2014) used a beta model to examine the linkage in between sensitivity associated with macroeconomic variables along with the sensitivity of stock market index to world index. It was evident that in comparison to inflation beta towards the beta of stock market,

output beta found more significant and could affect nearly 25% towards the sensitivity of stock market index. In account of beta of stock market index variation trade openness also found insignificant.

Research Objectives

1. To examine the degree of relationship exists in between the movement of macroeconomic variables and stock returns in India.
2. To find the impact of macroeconomic variables on Nifty returns.

III. RESEARCH METHODOLOGY

The dependent variable selected in the study was Nifty and the independent variables are Import, Export, Net Fiscal Deficit (Government), Interest Rate (Prime Lending Rate), Revenue Receipt (Government), Gross Domestic Product (GDP), and Money Supply. Secondary data was collected from the NSE website. The data was based on 7 macroeconomic variables related to Nifty and other macroeconomic indicators from the data base of Indian economy through RBI website, India. The 18 years annual data was taken into consideration from the period of 2000 to 2018. Stock market is affected by several indicators and it is necessary to analyse the impact of these variables on Nifty. The study focused on how these factors affect the Nifty and in return that affects the investor's perception in the different investment avenues.

IV. RESULTS AND DISCUSSION

It could be observed from table 1 that there exist a high correlation between Nifty and the macroeconomic variables i.e. Money supply, GDP, Export and Import. Multiple Regression analysis was used with Nifty as the dependent variable and the other macroeconomic variables i.e. Export, import, money supply, .From the above table it represents NIFTY and Export, import, Money supply and GDP has the high correlation value .961,.959,.945, and .930. With an increase in theses macroeconomic variables there is also an increase in

the Nifty. Multiple regression analysis was used to model the relationship which given by the equation

Table 1Correlations Between NiFTY and Macroeconomic variables

	Ni ft y	Int ere st Rat e (Pri me Le ndi ng Rat e)	Net Fiscal Defici t (Gove rnm ent)	Revenue Receipt (Gover nm ent)	M on ey Su ppl y	G D P	Ex po rt	Im po rt
Pear son Corr elati on	1	.239	-.260	-.246	.961**	.959**	.945**	.930**
Sig. (2- taile d)		.340	.297	.326	.000	.000	.000	.000
N	18	18	18	18	18	18	18	18
Pear son Corr elati on		.239	.057	-.207	.187	.185	.242	.270
Sig. (2- taile d)		.340	.823	.410	.458	.463	.333	.279
N	18	18	18	18	18	18	18	18

Net Fiscal Deficit (Government)	Pearson Correlation	-.260	.057	1	-.413	-.224	.272	.221	.176
	Sig. (2-tailed)	.973	.823		.088	.371	.275	.379	.485
	N	18	18	18	18	18	18	18	18
Revenue Receipt (Government)	Pearson Correlation	-.246	.207	-.413	1	-.407	.393	.376	
	Sig. (2-tailed)	.326	.410	.088		.094	.102	.124	
	N	18	18	18	18	18	18	18	
Money Supply	Pearson Correlation	-.961	.187	-.224	-.407	1	.976	.984	
	Sig. (2-tailed)	.000	.458	.371	.094		.000	.000	
	N	18	18	18	18	18	18	18	
GDP	Pearson Correlation	-.959	.185	-.272	-.409	.997	.981	.961	
	Sig. (2-tailed)	.000	.458	.371	.094		.000	.000	
	N	18	18	18	18	18	18	18	

Export	Sig. (2-tailed)	.000	.463	.275	.092	.000	.000	.000	
	N	18	18	18	18	18	18	18	
	Pearson Correlation	.945	.242	-.221	-.393	.986	.980	.994	
	Sig. (2-tailed)	.000	.333	.379	.107	.000	.000	.000	
Import	Sig. (2-tailed)	.000	.279	.485	.124	.000	.000	.000	
	N	18	18	18	18	18	18	18	
	Pearson Correlation	.930	.270	-.176	-.376	.974	.961	.994	
	Sig. (2-tailed)	.000	.279	.485	.124	.000	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed).

Nifty = $\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \beta_7 x_7 + \epsilon$

Table-2 Regression Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.989 ^a	.978	.962	515.95834	2.881

a. Predictors: (Constant), Import, Net Fiscal Deficit (Government), Interest Rate (Prime Lending Rate), Revenue Receipt(Government) , GDP, Export, Money Supply

b. Dependent Variable: Nifty

The multiple regressions are validated using the Coefficient of determination R^2 . It is the proportion of variation in the dependent variable Y explained in the regression model. The value is high which implied the model is the best fit. The macroeconomic variables explain 97.8% of the variation in the explaining the dependent variable.

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	116425126.196	7	16632160.885	62.477	.000 ^b
Residual	2662130.117	10	266213.012		
Total	119087256.314	17			

a. Dependent Variable: Nifty

b. Predictors: (Constant), Import, Net Fiscal Deficit (Government), Interest Rate (Prime Lending Rate), Revenue Receipt(Government) , GDP, Export, Money Supply

There is statistically significant relationship between macroeconomic variables and the Nifty.

Coefficients^a

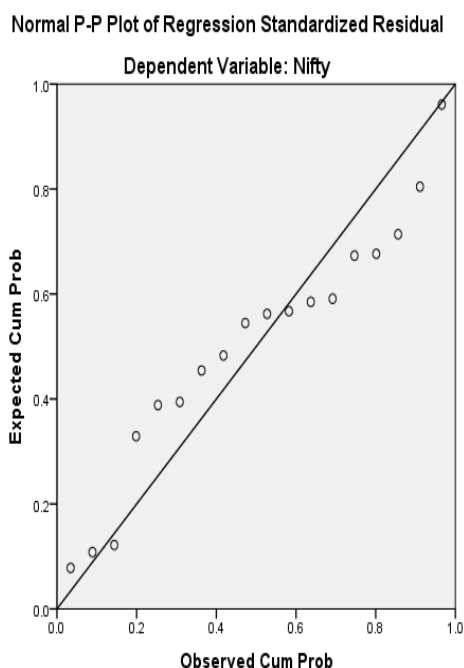
Model	Unstandardized Coefficients	Standardized Coefficients	Sig.	95.0% Confidence Interval for B
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	B	Std. Error	Beta		Lower Bound	Upper Bound
(Constant)	17139.565	5369.888		3.192	10.422	5174.709
Interest Rate (Prime Lending Rate)	242.704	102.624	.139	2.365	14.043	471.364
Net Fiscal Deficit (Government)	552.933	325.547	.214	1.698	172.431	1278.297
Revenue Receipt(Government)	1429.920	385.262	.348	3.712	571.504	2288.337
Money Supply	.045	.119	.696	.377	-.221	.311
GDP	.000	.001	.500	.289	-.002	.003
Export	.004	.002	1.382	1.580	-.001	.009
Import	-.003	.002	-1.472	1.868	-.007	.001

a. Dependent Variable: Nifty

The multiple regression model is represented as :

Nifty = 17139.565+.242.704*Interest Rate +552.933*Net Fiscal Deficit+1429.920*Revenue Receipt +.045*Money supply +.000*GDP+.004*Export+(-.003) Import. Interest rate and Revenue are the macroeconomic variables which are statistically significant with Nifty.



The diagonal line is the cumulative distribution of a normal distribution whereas the dots present the cumulative distribution of the residuals since the dots are close to the diagonal lines, we conclude that residuals follow an approximate normal distribution.

V. CONCLUSION

Macroeconomic variables are the important barometer of the Indian economy. The correlation between GDP, Money supply, Import and Export with Nifty is very high and thus it specifies with an increase in these macroeconomic variables there is an increase in the Nifty. The government should make strategies and policies with the alignment of framework in the context of these macroeconomic variables. The seven variables studied in this study show how it can influence the dependent variable that is Nifty. As the macroeconomic variable has an impact on NSE Nifty, for better return in stock market and to gain the confidence of the investors, government and other policy makers who formulate the strategy should redesigning their strategy in considering these macroeconomic variables.

VI. SCOPE & LIMITATIONS OF THE STUDY

Real economy can be affected by development in stock market or not is always a matter of discussion both at theoretical and empirical level by the researchers. The scope of the present study is to analyse the dynamic link in between macroeconomic activities and stock market in India during 2000 to 2018 basically after the financial sector reforms. Here the definition of stock market is limited to equity market only. Here the variables proxies for macroeconomic fundamentals are related to Government expenditure and receipts and some key elements related to monetary policy like prime lending rate, money supply were selected. As economic growth indicator GDP was selected for representing real economic growth of the country. The findings of the present study will enlighten researchers to further analyze such dynamic relationship by considering some more recent data of the economy.

The entire analysis was depending on secondary data which were collected from Data Base of Indian Economy and the websites of National Stock Exchange. The research could have added some more value additions if it could have considered some valuable opinion from investors through a designed questionnaire.

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