Macro Economic Variables Affecting Share Prices Volatility in India: A Study With Reference to NSE, India

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Abstract: The current study investigates the variation of share price on three prominent macro-economic variables viz., GDP, Inflation rate and Interest rate in NSE, India from April 2013 to March 2018 (Financial Year) via monthly data of nifty 50 companies. The study involves a descriptive survey method and data collected was evaluated by means of the software statistical package for social sciences (SPSS version 22) and Microsoft excel. The study accomplishes that share price volatility of NSE depends on GDP, inflation rate and interest rate. The three prominent independent (economical) variables studied elucidate nearly 97.9% be governed by share price volatility characterized by R². This also means remnant 2.1% depends on the others factors also. The regression analysis signifies all predictor variable factors; share price volatility will be 15583.346. Keeping all the independent variables at zero, a unit rise in GDP causes a moderate rise of 0.367 in share price volatility; a unit enhancement in inflation rate causes a 0.992 rise in share price volatility; a unit increase in interest rate significantly leads to 0.088 upsurges in share price volatility among firms listed at the National stock exchange (NSE), India.

Key words: National stock exchange, GDP, Interest rate, Inflation rate, regression model

I. INTRODUCTION

In this modern era stock exchange plays a dynamic role in mobilizing long term funds and trading of shares. These stock exchanges are responsible for investment, capital establishment and also act as the health indicator of stock exchange of the Indian economy. After economic liberalisation stock market found to have a considerable growth in the volume of the trade which manifest of progress in the stock market. A well performing stock exchange plays a helpful in economic activity through growth and saving, efficient allocation of investment and attracting foreign direct investment.

The numerous researches have been conducted on the macro-economic variables and study reveals the long run relationship between macroeconomic variables and stock market performance. Naik (2013) explored the relationships between the Indian stock market index, industrial production index, wholesale price index, money supply, treasury bills rates and exchange rates. Generally, the macroeconomic variable stimulus stock market performance both national as well as international market. Many scholars have attributed macro-economic factors as factors affecting stock price such as industrial production, Inflation rate, Per capita income consumption, oil price change, risk premium, yield curve (Chen, Nai-Fu, 2012). Money Supply and exchange rates(Ouma, 2014). CPI, PPI, balance of trade, Employment report, monetary aggregate (Flannery, 2002), (Thorbecke, 1997), Gold price and silver price (Patel, 2012) and business cycle(Corradi, 2013).

It is well known, Gross domestic product (GDP) is a regulatory measure of the market value of all goods and also services manufactured in stipulated time. The values of GDP generally determine the economic performance of the respective country. On the other hand, sustained enhancement in the general level of prices for goods and services are referred as Inflation rate. The rise in the level of inflation causes higher money supply. The shift in demand curves towards the left or right signifies the rise or fall in the interest rate in the economy. Thus these GDP growth, inflation rate and interest will rise the volatility of stock return leading to high risk and the making the investors to switch their investment to less risky portfolios.

From the extensive literature surveyed that stock market plays a remarkable role as an indicator of economic growth in this global economy. It is said that the size of world stock market leaps up to 55 trillion $ and the total derivative is about 850 trillion $ (Hussain, 2012). Like other countries, stock markets in India play a vital role in economic as well as industrial growth thereby increasing the investments and employment opportunities. The main objectives of this paper is to study the most influencing factors and its variations in the stock price of NSE and explored the impact of those factors on share price and functional relationship among them. Hence in this study, we try to find out some macro-economic (External) factors such as GDP, Inflation rate and interest rate which unswervingly influence on market price of equity stock of NSE stock in India and examine the extent of their functional relationships with the same.

II. AIMS AND OBJECTIVE

The current study will attempt to investigate and identify the most influencing factors of NSE stock markets with an objective exploratory the empirical relationship
between stock prices and Macro economic factors such as GDP, Inflation rate, Interest rate. The outcome of the research is useful for investors to determine the future behaviour and performance of stock prices, for identifying investment approaches, pursuing available investment opportunities, and reducing the probability of high value losses in the market.

III. METHODOLOGY
The study undertaken is analytical in nature using secondary data for the purpose of empirical evaluation of stock price and explanatory variables. Data collection for research will be done based on the secondary data collected from websites of National Stock Exchange. The secondary data is also collected from reports and researches published in national and international journals, web sites periodicals, magazines, newspapers, Annual Financial Reports, and other reports of selected companies. A total about 50 companies of nifty are considered for sample and their data on Gross domestic product (GDP), Inflation rate and Interest rate will be collected for the period of five years. In addition to eloquent statistical tools and multiple regression model will be applied for the analysis of data using necessary statistical software.

A. Model Specification
The study involves an econometric methodology by means of ordinary linear square regression model. The formulated regression equation is as follows

\[ SPV = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \]

Where, \( SPV \) is share price variability

\( \beta_0 \): Indicates the value of \( SPV \) (a constant) when all the values of explanatory variables are zero.

\( X_1 \) = Gross domestic product (GDP)

\( X_2 \) = Inflation rate (IR)

\( X_3 \) = Interest rate

\( \beta_1, \beta_2 \) and \( \beta_3 \) are coefficients of the independent variables.

\( \epsilon \) is the random error term.

B. Data Type
The secondary data types are utilized in order to do the analysis. The data type mainly involved are obtained from various sources such as annual reports, financial statements, protocols and NSE websites for the period 2013-14 to 2017-18 financial year.

C. Data Analysis and Software package
Analyses of the data that govern the parameters affecting share price volatility are done using the firms listed in NSE, India. This was accomplished using the software statistical package for social sciences (SPSS version 21) and Microsoft excel.

D. Analysis of the Result
Reminiscent statistics benevolences the mean, maximum and minimum values of variables used in this current study composed with their standard deviations.

1. Share Price

<table>
<thead>
<tr>
<th>Share price</th>
<th>Year</th>
<th>Maximum</th>
<th>Minimum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013-14</td>
<td>6046.54</td>
<td>5969.84</td>
<td>6008.19</td>
<td>0.0110</td>
</tr>
<tr>
<td></td>
<td>2014-15</td>
<td>8012.56</td>
<td>7923.24</td>
<td>7967.90</td>
<td>0.0086</td>
</tr>
<tr>
<td></td>
<td>2015-16</td>
<td>8036.20</td>
<td>7935.02</td>
<td>7985.61</td>
<td>0.0108</td>
</tr>
<tr>
<td></td>
<td>2016-17</td>
<td>8458.57</td>
<td>8381.20</td>
<td>8419.89</td>
<td>0.0078</td>
</tr>
<tr>
<td></td>
<td>2017-18</td>
<td>10071.68</td>
<td>9989.28</td>
<td>10030.48</td>
<td>0.0063</td>
</tr>
</tbody>
</table>

Table 1 signifies the descriptive statistical variation of Share price for the corresponding financial year 2013-14 to 2017-18. This means obtained signifies an increasing trend in the share price with enhancement in the years. On the other hand the statistical variations in the standard deviation with the share price are observed.

2. GDP

<table>
<thead>
<tr>
<th>GDP</th>
<th>Year</th>
<th>Max</th>
<th>Min</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013-14</td>
<td>7.5</td>
<td>5.6</td>
<td>6.6</td>
<td>1.3435</td>
</tr>
<tr>
<td></td>
<td>2014-15</td>
<td>8.3</td>
<td>6</td>
<td>7.2</td>
<td>1.6263</td>
</tr>
<tr>
<td></td>
<td>2015-16</td>
<td>9.2</td>
<td>7.4</td>
<td>8.3</td>
<td>1.2728</td>
</tr>
<tr>
<td></td>
<td>2016-17</td>
<td>7.9</td>
<td>6.1</td>
<td>7.0</td>
<td>1.2728</td>
</tr>
<tr>
<td></td>
<td>2017-18</td>
<td>7.2</td>
<td>5.7</td>
<td>6.5</td>
<td>1.0607</td>
</tr>
</tbody>
</table>

Table 2 signifies the descriptive statistical variation of GDP for the corresponding financial year 2013 to 2018. The irregular variations observed in the GDP for the aforementioned firms listed in NSE signifies the highest being 8.3 in 2015-16 and lowest of 6.5 in 2017-18. These disparities are may be due to variations of agriculture production, industrial demand, Tax reforms, ease of doing business, potentially untapped markets and less or non-corrupt governance.
3. Inflation Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Max</th>
<th>Min</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-14</td>
<td>12.174</td>
<td>7.882</td>
<td>10.03</td>
<td>3.03490</td>
</tr>
<tr>
<td>2014-15</td>
<td>8.483</td>
<td>3.267</td>
<td>5.88</td>
<td>3.68827</td>
</tr>
<tr>
<td>2015-16</td>
<td>5.69</td>
<td>3.691</td>
<td>4.69</td>
<td>1.41351</td>
</tr>
<tr>
<td>2016-17</td>
<td>6.068</td>
<td>3.17</td>
<td>4.62</td>
<td>2.04920</td>
</tr>
<tr>
<td>2017-18</td>
<td>5.21</td>
<td>1.54</td>
<td>3.38</td>
<td>2.59508</td>
</tr>
</tbody>
</table>

Table 3 suggests the descriptive statistical variation of Inflation rate for the analogous financial year 2013-14 to 2017-18. The observed modest decreasing trend in the inflation rate is generally due to changes in cost price index (CPI) related to the basket of cost price goods.

4. Interest Rate

Table 4 epitomizes the variations of interest rate for the respective financial year. The significant decrease in the interest rate for the financial year 2017-18 is 6.13. This tells about the good economic health which in turn shows an enhancement in value of the currency, decrease in interest rate of money deposited within the bank, repo rate, reverse repo rate, statutory liquidity ratio (SLR) and cash reserve ratio (CRR).

5. Regression Analysis

The multiple regression analysis is conducted to investigate the variations of two independent variables (GDP, Inflation rate) on dependent variable (share price volatility) of national stock exchange (NSE), India. The regression analysis to determine coefficient of determination is done using statistical package for social sciences (SPSS V 21.0) and also Microsoft Excel. The basic features of the study involve the three independent variables as shown in the descriptive statistical table 5.

6. Model Summary

The three prominent independent (economic) variables studied elucidate nearly 97.9% be governed by share price volatility characterized by $R^2$. This also means remnant 2.1% depends on the others factors also. The smaller value of F change observed in the overhead table 6 well supports the null hypothesis of the three prominent predictors with its variation with criterion variable.

7. ANOVA results

The ANOVA results (Table 7) show the statistically significant values of significance 0.0183 representing the variations of GDP and inflation rate on share price instability. The value of p factor less than 0.05 indicates the predictor variables significantly affect the share price volatility.

Generally, beta values in the standardized coefficient (Table 8) represent the influence of predictor variable by the disparities in criterion variable. The positive beta value in the standardized co-efficient symbolises the direct relation to the market. It tells about the plausible for investment tends to increase as soon as the market goes up and vice versa.
the above regression analysis considering all predictor variable factors, share price volatility will be 15583.346. Further keeping all the independent variables at zero, a unit rise in GDP causes a moderate rise of 0.367 in share price volatility; a unit enhancement in inflation rate causes a 0.992 rise in share price volatility; a unit increase in interest rate leads to 0.88 upsurges in share price volatility.

**TABLE VIII**
Unstandardized Coefficients and standardized Coefficients of three independent variables

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>15583.346</td>
<td></td>
<td>5.933</td>
<td>.0106</td>
</tr>
<tr>
<td>GDP</td>
<td>733.023</td>
<td>384.347</td>
<td>1.907</td>
<td>.0307</td>
</tr>
<tr>
<td>Inflation</td>
<td>610.646</td>
<td>151.936</td>
<td>4.019</td>
<td>.0155</td>
</tr>
<tr>
<td>Rate</td>
<td>172.914</td>
<td>534.079</td>
<td>3.24</td>
<td>.00801</td>
</tr>
<tr>
<td>Interest</td>
<td>158.346</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate</td>
<td>172.914</td>
<td>534.079</td>
<td>3.24</td>
<td>.00801</td>
</tr>
</tbody>
</table>

**IV. CONCLUSIONS**

The current study accomplishes that share price volatility of NSE depends on GDP, inflation rate and interest rate. The three prominent independent (economical) variables studied elucidate nearly 97.9% governed by share price volatility characterized by R². This also means remnant 2.1% depends on the others factors also. The regression analysis signifies all predictor variable factors; share price volatility will be 15583.346. Keeping all the independent variables at zero, a unit rise in GDP causes a moderate rise of 0.367 in share price volatility; a unit enhancement in inflation rate causes a 0.992 rise in share price volatility; a unit increase in interest rate significantly leads to 0.88 upsurges in share price volatility among firms listed at the National stock exchange (NSE), India.

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