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 R^2. This also means remnant 2.1% depends on the others factors also. The regression analysis signifies all predicator 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

$SPV = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + Є$

Where, SPV is share price variability

β_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

β_1, β_2 and β_3 are coefficients of the independent variables.

Є 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 I

Descriptive statistical variation of Share price for the corresponding financial year

Share price				
Year	**Maximum**	**Minimum**	**Mean**	**SD**
2013-14	6046.54	5969.84	6008.19	0.0110
2014-15	8012.56	7923.24	7967.90	0.0086
2015-16	8036.20	7935.02	7985.61	0.0108
2016-17	8458.57	8381.20	8419.89	0.0078
2017-18	10071.68	9989.28	10030.48	0.0063

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 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.

TABLE II

Descriptive statistical variation of GDP for the corresponding financial year

GDP				
Year	**Max**	**Min**	**Mean**	**SD**
2013-14	7.5	5.6	6.6	1.3435
2014-15	8.3	6	7.2	1.6263
2015-16	9.2	7.4	8.3	1.2728
2016-17	7.9	6.1	7.0	1.2728
2017-18	7.2	5.7	6.5	1.0607

3. Inflation Rate

TABLE III

Descriptive statistical variation of Inflation rate for the corresponding financial year

Inflation rate				
Year	**Max**	**Min**	**Mean**	**SD**
2013-14	12.174	7.882	10.03	3.03490
2014-15	8.483	3.267	5.88	3.68827
2015-16	5.69	3.691	4.69	1.41351
2016-17	6.068	3.17	4.62	2.04920
2017-18	5.21	1.54	3.38	2.59508

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 tell 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).

TABLE IV

Variations of interest rate for the respective financial year

Interest rate				
Year	**Maximum**	**Minimum**	**Mean**	**SD**
2013-14	8	7.25	7.63	0.2857
2014-15	8	7.5	7.75	0.1559
2015-16	7.5	6.75	7.13	0.3248
2016-17	6.5	6.25	6.38	0.1233
2017-18	6.25	6	6.13	0.1233

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.

TABLE V

Descriptive statics of the variables used

	Mean	Std. Deviation	N
Share Price	8082.4140	1434.72479	5
GDP	7.1200	.71903	5
Inflation Rate	5.7200	2.56652	5
Interest Rate	7.0040	.72759	5

6. Model Summary

The three prominent independent (economical) 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 predicators with its variation with criterion variable.

TABLE VI

Model summary of three variables used

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.990[a]	.979	.917	414.00042	.979	15.680

7. ANOVA results

TABLE VII

ANOVA results of three independent variables

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8062344.517	3	2687448.172	15.680	.0183[b]
	Residual	171396.347	1	171396.347		
	Total	8233740.864	4			

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 predicator variables significantly affect the share price volatility.

Generally, beta values in the standardized co-efficient (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. In

the above regression analysis considering all predicator 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

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	15583.346	2626.700		5.933	.0106
	GDP	733.023	384.347	.367	1.907	.0307
	Inflation Rate	610.646	151.936	.992	4.019	.0155
	Interest Rate	172.914	534.079	.088	.324	.00801

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% be governed by share price volatility characterized by R^2. This also means remnant 2.1% depends on the others factors also. The regression analysis signifies all predicator 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.

REFERENCES

[1]. Das et.al . (2007). Factors Affecting market price of sensex shares. *ICFAI journal applied finance*, vol. 13, 1-6.

[2]. Dissanayake et.al. (2017). The impact of internal factors on share price: Reference to hotel industry in Colombo stock exchange. *Business and Management Research Journal* , Vol. 7, 33 - 37.

[3]. Adebis et.al. (2015). Equity share price determinants: a survey of literature. *Arabian Journal of Business and Management Review*, 5, 1-7

[4]. chao et.al. (2016). *Impacts of macroeconomic factors on the performance of stock market in Malaysia,*. Malaysia: Universiti Tunku Abdul Raham.

[5]. Chen, Nai-Fu, . (2012). Economic Forces. *chicago journals*, Vol. 59, No. 3 (Jul., 1986), pp. 383-403.

[6]. Corradi, v. e. (2013). Macroeconomic determinants of stock volatility and volatality premiums. *journalss of monetory ecconomics*.

[7]. Downs. (1991). An alternative approach to fundamental analysis: The asset side of the equation. . *Journal of Portfolio Management*, 17, 6-17.

[8]. Flannery, m. J. (2002). Macro economic factosr do influence aggregate stock return . *the reveiw of financial studies* , 15, 751-782.

[9]. Gay. (2008). Effect Of Macroeconomic Variables On Stock Market Returns For Four Emerging Economies: Brazil, Russia, India, And China;. *International Business & Economics Research Journal* , 7,1-8.

[10]. Gill et.al. (2012). Determinants of Equity Share Prices: Evidence from American Firms. *International Research Journal of Finance and Economics,* , 90, 176- 191.

[11]. Gompers et.al. (2003). Corporate Governance and Equity Prices. *Journal of Economics*, 118, 107-155.

[12]. Jayaraj. (2013). The Factor Model for Determining the Individual Investment behavior in India. . *IOSR Journal of Economics and Finance* , 1, 21-32.

[13]. Khositkulporn. (2013). *The Factors Affecting Stock Market Volatility and Contagion: Thailand and South-East Asia Evidence.* Melbourne : School of Business Victoria University.

[14]. Kumar. (2013). The Effect of Macroeconomic Factors on Indian Stock Market Performance: A Factor Analysis Approach . *IOSR Journal of Economics and Finance* ,, 3, 14-21.

[15]. Malhotra et.al. (2013). Determinants of Stock Prices: Empirical Evidence from NSE 100 Companies . *IRACST- International Journal of Research in Management & Technology* , 3,1-9

[16]. Mohammad et.al. (2017). Effect of macroeconomic variables on stock market performance of SAARC countries. *Asian Economic and Financial Review*, 7,1-8

[17]. Muragu. (1990). *Stock Market efficiency in Developing Countries: A case study of the Nairobi Stock Exchange*. university of Glasgow.

[18]. Naik. (2013). Does Stock Market Respond to Economic Fundamentals? Time Series Analysis from Indian Data. *Journal of Applied Economic and Business Research*, 3, 34-50.

[19]. Narayan. (2015). The Determinants of Stock Prices: New Evideance from the Indian Banking Sector. *Emerging Markets Finance & Trade* , 50, 5–15.

[20]. Ouma. (2014). the impact of macroeconomic variables on stock market returns in kenya. *International Journal of Business and Commerce* ,3, 1-8

[21]. Patel. (2012). The effect of Macroeconomic : Determinants on the Performance of the Indian Stock Marke. *NMIMS management review*, volume XXII.

[22]. Rappaport. (1986). The affordable dividend approach to equity valuation. *Financial Analysts Journal*,, 42, 52-58.

[23]. Rouband et.al. (2016). On The determinants of stock market dynamics in emerging countries: the role of economic policy uncertainty in China and India. *Research gate*, 36, 1-10

[24]. Salam et.al. (2015). Factors Affecting the Stock Price Movement: A Case Study on Dhaka Stock Exchange. *IISTE*, Vol.5, No.16.

[25]. Sanjeet. (2011). Determinants of equity share prices in India. *Journal of Arts, Science & Commerce,*, 2(4), 51-60.

[26]. Sarma. (2004.). Stock Market Seasonality in an Emerging Market. *VIKALPA* , VOLUME 29 • NO 3 .

[27]. Shankar et.al. (2015). *Mispricing in single stock futures:*. chennai: NSE.

[28]. Sharif et.al. (2014). Analysis of Factors Affecting Share Prices: The Case of Bahrain Stock Exchange . *International Journal of Economics and Finance*, Vol. 7, No. 3.

[29]. Sharma. (2011). Determinants of equity share prices in India. *Research world*, Vol.– II, Issue –4.

[30]. Sharma et.al. (2006). Determinants of equity share prices in Indian corporate sector: An empirical study. *The ICFAI Journal of Applied Finance*, 12(4), 21-38.

[31]. Sharma, S. (. (2011). Determinants of equity share prices in India. *Journal of Arts, Science & Commerce*, ., 2(4), 51-60.

[32]. Srinivasan. (2012). Determinants of Equity Share Prices in India: A Panel Data Approach . *The Romanian Economic Journal Year XV no. 46*, XV no. 46.

[33]. Thorbecke, W. (1997). stock market return and montary policy . *the Journals of finance* , vol LJI, No 2.

[34]. Tripathi et.al. (2014). Stock Market Performance and Macroeconomic Factors: The Study of Indian Equity Market. *Global business reveiw*, 15(2) 291–316.

[35]. Uddin. (2013). Determinants of Stock Prices in Financial Sector Companies in Bangladesh- A Study on Dhaka Stock Exchange (DSE) interdisciplinary . *journal of contemporary research in business* , vol 5 no 3.

[36]. Wilcox. (1984). The P/B-ROE valuation model. *Financial Analysts Journal* , 40(1), 58-66.