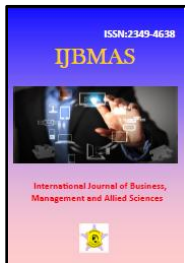# INTERNATIONAL JOURNAL OF BUSINESS, MANAGEMENT AND ALLIED SCIENCES (IJBMAS)

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Growth Estimation and Forecasting of BSE Sensex

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ABSTRACT

In the present paper, growth of BSE Sensex in almost past 3 decades has been estimated by applying OLS regression and by thus forecasting of BSE Sensex has been made using Auto regression technique [AR(p)] to predict the path of BSE Sensex in near future. As per the findings of the current study, it has been observed that during past 3 decades BSE Sensex has earned a huge growth and this positive trend is expected to be continued in near future.

INTRODUCTION

Capital market is a form part of economy of any country and its behaviour has a significant impact on the economy of such country. Stock price indices are considered as capital market barometer which reflects the overall condition of capital market in any country. The flagship Indian stock price index 'S&P BSE SENSEX', Popularly known as 'BSE 30' or 'BSE SENSEX', is a free-float market-weighted stock market index which comprises of 30 renowned and financially stable companies listed in Bombay Stock Exchange. The 30 companies which are listed in Bombay Stock Exchange under 'BSE 30' are the market leaders in various business sectors and also mostly active traded stocks in Indian stock market. From the very beginning, BSE SENSEX is considered as the pulse of the Indian stock market. 100 is taken as the base value of the BSE SENSEX on 1 April 1979 and 1978–1979 has been considered as base year.

In the past three decades, it has been observed that Indian capital market, as an emerging market, has grown up tremendously. BSE Sensex is one of the flagship stock price indices in Indian stock market. In this paper, it has been tried to estimate how much BSE Sensex, as the form part of Indian capital market, has grown during the period 1986 to 2016 and after this it has been tried to forecast in which way BSE Sensex will be going to move in the near future holding period 2017-2020.

Objective:

The current paper has been prepared with two significant objectives:

   i.   To estimate the growth of BSE Sensex for the study period;

   ii.   To forecast the growth of BSE Sensex in near future.

In order to pursue the present study, various literatures written by eminent authors and researchers have been surveyed. Few of them have been mentioned as follows:

Ghosh, Bandyopadhyay and Choudhuri, in the year 2011, conducted a study to forecast BSE Sensex subject to the effects of various macroeconomic variables like gold price, inflation, foreign exchange reserve etc. They have found BSE Sensex to be optimized with the mixed influence of various independent macroeconomic variables.

Patel, Shah, Thakkar and Kotecha have executed a research study in the year 2015 for predicting Indian stock price indices. As findings, the positivity in future performance of indices has been expected

Database and Methodology

For the present paper, yearly closing data of BSE Sensex has been taken from the official website of Bombay Stock Exchange for the period 1986 to 2016. For estimating the growth of BSE Sensex for the aforesaid period, Ordinary Least Square (OLS) technique has been employed where, historical yearly observations of BSE Sensex for the mentioned period have been taken as dependent variable and time values are taken as independent variables. OLS method has been framed as follows:

$$BSESensex = \theta + \gamma.t$$

Here, '*BSE Sensex*' is dependent variable, 'θ' represents constant and 'γ' is the coefficient of independent variable '*Time*' (t).

Based on the result of OLS model, value of BSE Sensex has been forecasted for the near future holding the period 2017-2020 using autoregression technique [AR(p)]. AR(p) model, hired for this purpose, is given as follows:

$$BSESensex_t = \theta + BSESensex_{t-1} + BSESensex_{t-2} + ... + BSESensex_{t-p} + \varepsilon_t$$

Where, '$BSESensex_t$' is dependent variable and lag values of BSE Sensex are independent variables where p=30. ε_t is the error term in the model. Based on this model, future values of BSE Sensex for the period 2017-2020 i.e. $BSESensex_{t+1}$(for 2017), $BSESensex_{t+2}$ (for 2018), $BSESensex_{t+3}$ (for 2019) and $BSESensex_{t+4}$ (for 2020) have been estimated. For both the analysis, 'Gretl' software has been used.

Findings of the study

The result of OLS regression is as follows:

OLS regression using observations 1986-2016 (T = 31)
Dependent variable: BSE Sensex

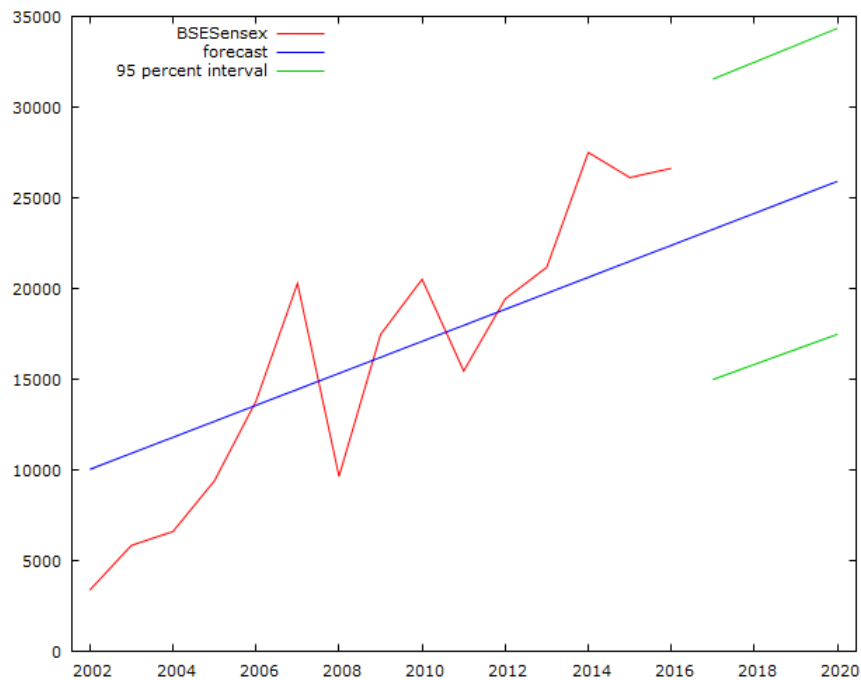|	Coefficient	Std. Error	t-ratio	p-value	
const	−4963.50	1398.34	−3.550	0.0013	***
Time	882.023	76.2856	11.56	<0.0001	***

Mean dependent var	9148.872	S.D. dependent var	8846.638
Sum squared resid	4.19e+08	S.E. of regression	3798.991
R-squared	0.821739	Adjusted R-squared	0.815592
F(1, 29)	133.6827	P-value(F)	2.22e-12
Log-likelihood	−298.4706	Akaike criterion	600.9412
Schwarz criterion	603.8092	Hannan-Quinn	601.8761
rho	0.581010	Durbin-Watson	0.794277

In the result showing above, it is evident from the coefficient of time (γ = 882.023) that BSE Sensex has achieved a tremendous growth (near about '882 times' or '88202%' growth) during the period 1986- 2016. Result of Adjusted R^2 (0.815592) reflects a good fit of data in the OLS model. But, Durbin-Watson statistic has indicated a minor sign of problem of autocorrelation in the OLS model.

Now, the result of forecasting using AR(p) model has been given as follows:

Years	BSE Sensex	prediction	std. error	95% interval
2017	BSE Sensex	23261.2	4048.17	(14981.8, 31540.7)
2018	BSE Sensex	24143.3	4071.82	(15815.5, 32471.1)
2019	BSE Sensex	25025.3	4096.76	(16646.5, 33404.1)
2020	BSE Sensex	25907.3	4122.95	(17474.9, 34339.7)

[For 95% confidence intervals, t(29, 0.025) = 2.045]

From the result, given as above, it has been found that the future value of BSE Sensex are expected to be 23261.2, 24143.3, 25025.3 and 25907.3 with 95% confidence interval of (14981.8, 31540.7), (15815.5, 32471.1), (16646.5, 33404.1) and (17474.9, 34339.7) in the years 2017, 2018, 2019 and 2020 respectively. So, the outcome of forecasting reflects that BSE Sensex will continue to grow in the near future holding the period 2017-2020.

Conclusion

All through this analysis it is evident that BSE Sensex has grown up at a lightning fast speed during the period 1986-2016 and is also expected to grow even more in the recent future holding the period 2017-2020. As BSE Sensex is one the key indicators of Indian stock market, it is also expected that Indian stock market, one of leading emerging stock markets, will also grow firmly in the near future.

References

[1].   Chandra, A. (2011). Stock market anomalies: A test of calendar effect in the Bombay Stock Exchange (BSE). *Indian Journal of Finance*, *5*(5), 23-31.

[2].   Das, S., Pattanayak, J. K., & Pathak, P. (2008). The effect of quarterly earnings announcements on Sensex: A case with clustering of events. *The IUP Journal of Accounting Research and Audit Practices*, *7*(4), 64-78.

[3].   Ghosh, A., Bandyopadhyay, G., & Choudhuri, K. (2011). Forecasting BSE sensex under optimal conditions: An investigation post factor analysis. *Journal of Business Studies Quarterly*, *3*(2), 57.

[4]. Manimaran, P., Panigrahi, P. K., & Parikh, J. C. (2008). Difference in nature of correlation between NASDAQ and BSE indices. *Physica A: Statistical Mechanics and its Applications*, *387*(23), 5810-5817.

[5]. Patel, J., Shah, S., Thakkar, P., & Kotecha, K. (2015). Predicting stock market index using fusion of machine learning techniques. *Expert Systems with Applications*, *42*(4), 2162-2172.

[6]. Singh, S., Tripathi, L. K., & Lalwani, K. (2012). An empirical study of impact of exchange rate & inflation rate on performance of BSE SENSEX.

[7]. Thomas, S., & Shah, A. (2002). Stock market response to Union Budget. *Economic and Political weekly*, 455-458.