EasyChair Preprint

№ 9128

Comparative Analysis of Impact of Global Economy on Indian Economy

Rishikesh Naware, Amaan Shaikh and Manas Singh

October 26, 2022

Comparative Analysis of Impact of Global Economy on Indian Economy

Rishikesh Naware, Amaan Shaikh and Manas Singh
Department of Information Technology, Thakur College of Engineering &Technology, Mumbai, India
rishikeshnaware7@gmail.com, manassingh300@gmail.com, amaan.faruk@gmail.com

Abstract – **The stock market is seeing elevated activities and is progressively acquiring significance. In the ongoing setting of globalization and the ensuing coordination of the worldwide markets this paper catches the patterns, similarities and patterns in the activities and developments of the Indian Stock Market in contrast with its worldwide partners. This article covers National Association of Securities Dealers Automated Quotations (NASDAQ), Hong Kong Stock exchange (HSE), National stock exchange FIFTY (NIFTY). The time span has been split into different periods to test the connection between the different trades to demonstrate that the Indian markets have become more coordinated with its worldwide partners and its response are pair with that are seen universally.**

Keywords: Stock Market, Comparative Analysis, Statistical analysis, Efficiency Test.

I. INTRODUCTION

Stock market price data is generated in huge volume, and it changes every second. Stock market is a complex and challenging system where people will either gain money or lose their entire life savings. In this work, an attempt is made for prediction of stock market trends. Two models are built, one for daily prediction and the other one is for monthly prediction. Supervised machine learning algorithms are used to build the models. As part of the daily prediction model, historical prices are combined with sentiments. Up to 70% of accuracy is observed using supervised machine learning algorithms on daily prediction models. Monthly prediction model tries to evaluate whether there is any similarity between any two months' trend. Evaluation proves that the trend of one month is least correlated with the trend of another month.

II. LITERATURE SURVEY

AVINASH POKHRIYAL et al [1] proposed a method wherein the Multiple Linear Regression and neural networks is carried out to the investor's economic choice making to make investments all type of stocks no matter the high / low index of the scripts, in a continuous time framework. The proposed framework has been examined with stock information received from the Asian Stock Market Database. Finally, the design, implementation and overall performance of the proposed multiple regression and neural network model are described. technique offers two key explanatory variables for bank performance and clearly and simply illustrates the impact of the contributing components. The approach has several drawbacks because its fundamental assumptions are always broken when real data is involved. Biased results are also produced by outliers. Data transformation, robust regression and ridge regression is one of the corrective actions to be implemented. This calls for the necessity of comprehending more statistical methods, which was outside the purview of this work. An artificial neural network uses inputs to produce results that are extremely accurate. The method increases its performance with many examples.

K.J SANDEEP et al [2] made a correlation analysis which focused on for very short term period that is from 10th November to 20th November of 2014, the variables of Asian and European countries were extracted by Indian opening time 9:15 from Asian countries previous day closing prices, European countries were opening 12:30 to 12:40. Estimations indicated that Japan, Singapore, European markets were impacting nifty, partial correlation indicated that all the countries that were selected had slightly to strong correlation. This investigation showed that the Singapore and Nifty are significantly influencing the Nifty opening. European markets were having an impact on nifty movement during the afternoon hours period. The volatility of the Indian market is also influenced by openings of selected Asian European markets on nifty.

K. MOFAZZAL HOSSAIN et al [3] presented a study which wherein they examined daily data from the NASDAQ from 5 February 1971 to 31 January 2009, daily data from the Dow Jones from 1 October 1928 to 31 January 2009, and daily data from the SENSEX during 1st July 1997 to 31st January 2009 to investigate the relationship between USA and Indian stock markets. To determine the relevant Hurst exponents, the Finite Variance Scaling Method, a type of scaling, is used to process these three-time series. According to the study, all three series display anti-persistent behavior (short-memory process). It is interesting to note that the related Hurst exponent values do not considerably differ from one another.

RAJIV KUMAR et al [4] suggest that India's financial area isn't profoundly coordinated with the worldwide financial framework, which saved it from the main round not favorable impacts of the worldwide financial crisis and left Indian banks generally unaffected. In any case, as the financial crisis transformed into an all-out worldwide economic slump, India couldn't get away from the subsequent round impacts. The worldwide crisis has impacted India through three channels: financial markets, exchange streams, and trade rates. The inversion in capital inflows, which made a credit smash in homegrown markets alongside a serious disintegration in trade interest, added to the downfall of GDP by multiple rates focuses in the fiscal year 2008-2009. In accordance with endeavors taken by governments and national banks from one side of the planet to the other, the public authority and the Reserve Bank of India went to forceful countercyclical lengths, strongly loosening up financial strategy and acquainting a fiscal improvement with support homegrown interest.

JANAK RAJ et al [5] provides and acknowledges the national stock markets have arisen as the significant channel for financial integration of developing business sector economies during globalization, liberation, and advances in information technology. Among the elements adding to developing financial integration are a fast expansion in the crossline versatility of private capital inflows because of investors looking for portfolio enhancement and improved yields, a developing dependence of countries on the reserve funds of different countries, and a change in the influence of organizations from debt-to-equity finance. It is by and large apparent that financial integration can be related with a few advantages, including improvement of markets and organizations and powerful cost disclosure, prompting higher reserve funds, speculation, and economic advancement.

DEEPAK KUMAR et al [6] helps us to understand the stock market prediction patterns are viewed as a significant movement and it is more successful. Thus, stock prices will prompt lucrative profits from sound taking choices. As a result of the stale and noisy information, stock market-related figures are difficult for investors. Thus, forecasting the stock market is difficult for investors to utilize their cash to create more gain. Stock market predictions utilize mathematical methodologies and learning tools. Their paper gives a total outline of 30 research papers suggesting methods that incorporate calculation methods, ML algorithms, execution parameters, and remarkable journals. The investigations are chosen in view of research questions. Consequently, these chosen studies are assisting with tracking down the ML strategies alongside their dataset for stock market prediction.

YAZEED ALSUBAIE et al [7] study shows that stock market forecasting using technical pointers (TIs) is universally applied by investors and researchers. Utilizing an insignificant number of info highlights is essential for fruitful prediction. Be that as it may, there is no agreement about what comprises a reasonable assortment of TIs. The selection of TIs reasonable for a given forecasting model remains part of an area of dynamic research. This study presents a point-by-point examination of the choice of a negligible number of pertinent TIs determined to increment precision, diminishing misclassification cost, and further developing venture return. Fifty universally used TIs were positioned utilizing

five different element determination methods. Tests were led utilizing nine classifiers, with a few element choice methods and different options for the quantity of TIs. A proposed cost-touchy calibrated naïve Bayes classifier figured out how to accomplish preferable in general venture execution over different classifiers. Tests were directed on datasets consisting of everyday time series of 99 stocks and the TASI market record.

TROY J. STRADER et al [8] proposed a systematic literature review methodology to identify applicable peer-reviewed journal articles from the past twenty years and bundle studies containing similar methods and contexts. Four categories that emerged were: artificial neural network studies, support vector machine studies, studies using genetic algorithms combined with other techniques, and studies using hybrid or other artificial intelligence approaches. Results showed that Artificial neural networks are best suited for predicting numerical stock market index values. Support vector machines are more suited for predicting whether the forecast is to rise or fall. Financial funding concept desires to be a stronger driving force underlying the ML structures' inputs, algorithms, and performance measures.

POLAMURI SUBBA RAO et al [9] studies different prediction techniques and their advantages when it comes to the stock market. The two general methods for stock prediction: Fundamental Analysis and Technical Analysis are studied, and technical analysis is preferred over fundamental analysis. Different prediction techniques included: Holt-Winters, Artificial Neural Network, Hidden Markov
Model, ARIMA Model, Time Series Linear Model, Recurrent Neural Networks. They concluded that to improve the prediction of the results of stock, combining two or more methods to construct a novel approach method would be efficient.

ERNEST KWAME AMPOMAH et al [10] proposes the ability of Gaussian Naïve Bayes ML algorithm to predict stock price movement. It has not been explored properly in the existing literature, Thus, the performance of GNB algorithm when combined with different feature scaling and feature extraction techniques, evaluated using F1-Score, specificity and AUC evaluation metrics showed that using scaling techniques alongside GNB provided much better results than the ones produced on combining either feature scaling technique or GNB algorithm and feature extraction technique except for GNB_LDA.

III. PROBLEM STATEMENT

Indian stock market holds a crucial value in the world's economy. Integration and influence of global markets on Indian markets need to be studied for investors to get a better understanding and for their benefits.
In Order to analyze the variation in the Indian markets, the goal of this paper is to identify the trends of the global markets and how it affects the Indian economy.

Objective:

1. To identify impact of global economy on Indian Market
2. To compare different models under Deep Learning and Machine Learning.

IV. DATA COLLECTION & VISUALIZATION

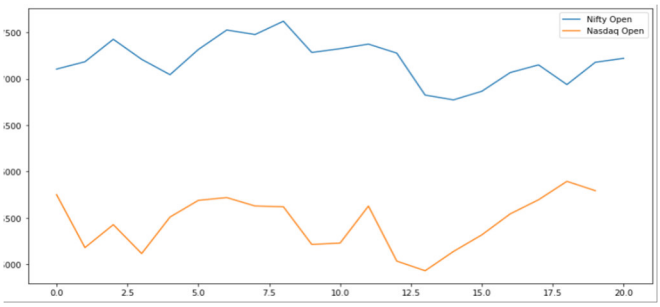

Fig. 1. Comparison of Nifty and Nasdaq for the month of December 2021

The above figure represents the difference and variation in stocks between Nifty and Nasdaq for

the month of December 2021. The trends and fluctuation can be seen from the graph and helps get a better understanding of how Nifty's stock rises and falls in comparison to Nasdaq's.

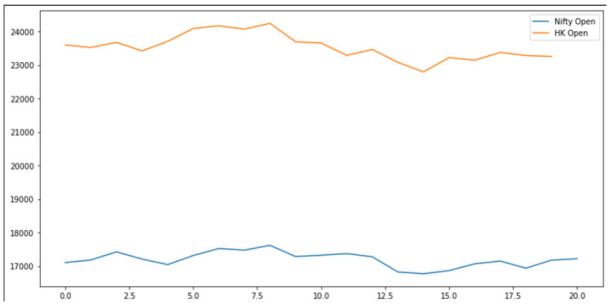

Fig. 2. Comparison of Nifty and Hang Seng for the month of December 2021

The above figure represents the difference and variation in stocks between Nifty and Hang Seng for the month of December 2021. The trends and fluctuation can be seen from the graph and helps get a better understanding of how Nifty's stock rises and falls in comparison to Hang Seng.

V. CONCLUSION

Prediction of the movements of the stock market index is very important for developing effective market trading strategies. Financial decisions to buy or sell an instrument may be made by the traders by choosing the effective predictive model. Successful prediction of Stock Market Index movements may be beneficial for investors. The tasks of predicting the movements of the Stock Market Index are highly complicated and very difficult. The global impact of how different markets from different countries affect Indian markets and how the variation and trends follow could be seen after implementing different algorithms. This empirical study attempted to predict the direction of the various stocks and identify the trends and patterns associated with them. It is concluded that the Global market affects the Indian markets in a huge way. The algorithms and systems which are traditional systems may not efficiently solve problems associated with this huge amount of data and may lead to the systems run very slowly and cannot yield the best and accurate result of prediction. But with the help of the Python environment, we can handle large data very efficiently without alternating the methods in the existing procedures. Future work can be proceeded using deep learning algorithms like Long Term Memory (LTM), Short Term Memory (STM), CNN as further implementation of this work.

VI. ACKNOWLEDGMENT

I gratefully acknowledge the support, guidance, and encouragement of my Dissertation Guide Associate Professor "Pranjali Kasture" for this novel work.

References

[1] AVINASH POKHRIYAL, "Comparative Analysis of Impact of Various Global Stock Markets and Determinants on Indian Stock Market Performance - A Case Study Using Multiple Linear Regression and Neural Networks", 2011

[2] K.J SANDEEP, "A STUDY OF GLOBAL MARKETS IMPACT ON NIFTY ",2015

[3] K. MOFAZZAL HOSSAIN, "RELATIONSHIP BETWEEN USA AND INDIAN STOCK MARKETS: A TIME SERIES ANALYSIS", 2009

[4] JANAK RAJ, "Integration of India's stock market with global and major regional markets"

[5] RAJIV KUMAR, "The Global Economic Crisis: Impact on India and Policy Responses", 2009

[6] TROY J. STRADER "Machine Learning Stock Market Prediction Studies: Review and Research Directions",2020

[7] POLAMURI SUBBA RAO, "A Survey on Stock Market Prediction UsingMachine Learning Techniques", 2020