

A Project/Dissertation Review-2 Report

on

Stock Price Prediction Using Machine Learning

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requirement for the award of the degree of*

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Engineering**



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Abstract

In stock market prediction, the aim is the future value of the financial stocks of a company. The recent trend in stock market prediction technologies is the machine learning to predict stock values. Factors considered are open, close, low, high, volume. in stock market consist of many numbers of company shares along with prices in stock market every minute stock price will changes depending on the company environment and country economic structure decisions. In stock market there are many brokers for handing the stocks buying and selling between the clients and company.

Stock market prediction seems a complex problem because there are many factors that have yet to be assumptions. Machine learning as such has many models.

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CHAPTER-1 Introduction

Stock Price Prediction:

What is the Stock Market?

A stock market is a public market where you can buy and sell shares for publicly listed companies. The stocks, also known as equities, represent ownership in the company. The stock exchange is the mediator that allows the buying and selling of shares.

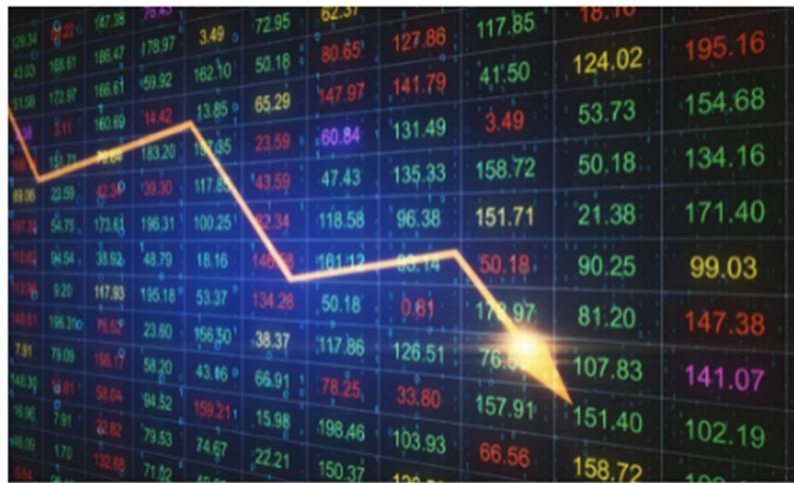


Figure 1

- Stock markets help companies to raise capital.
- It helps generate personal wealth.
- Stock markets serve as an indicator of the state of the economy.

Stock Price Prediction using machine learning helps you discover the future value of company stock and other financial assets traded on an exchange. The entire idea of predicting stock prices is to gain significant profits. Predicting how the stock market will perform is a hard task to do.

Long Short Term Memory Network (LSTM) for building your model to predict the stock prices. LTSMs are a type of Recurrent Neural Network for learning long-term dependencies. It is commonly used for processing and predicting time-series data.

CHAPTER-2

Literature Review

Research in finance has explored how stock markets are affected by their multi- source and heterogeneous data on some scales. Multi-source heterogeneous the stock market means that the data of the stock market includes data from different sources such as the stock market, the foreign exchange market and even the weather system, as well as the structure of stock prices, trading volumes, and stock news, announcements and social networks. and other unstructured data. In particular, the efficient market hypothesis believes that information from various sources in the stock market will have an impact on the stock market, while behavioral finance believes that

financial markets are explained, studied and predicted from the individual behaviors of traders and the motivations that produce such behaviors. the trend and extent of price fluctuations. These studies point out that the internal mechanism of the stock market is very complex, similar to Brownian motion. Combining the multi-source heterogeneous data in the stock market can more accurately classify and predict the stock market state. With the vigorous development of the stock market, it continues to generate a large number of multi-source heterogeneous data of various scales.

Obtaining accurate stock price forecasts can more effectively avoid future risks for decision makers; for regulators, it can strengthen the control of the stock market, regulate and guide the stock market in a timely manner, and contribute to the sustainable development of the economy. Development provides firm confidence and strong guarantees.

Progress of stock price prediction:

The research on stock behavior was first conducted by Bachelier in 1900. He used random walks to express stock price trends. Fama tested that stock price changes are characterized by random walks. Malkiel and Fama studied valid market assumptions in 1970 and found that all new information will be reflected in asset prices immediately without delay. Therefore, changes in future asset prices have nothing to do with past and present information. From their perspective, predicting future asset prices is considered impossible. On the other hand, many studies try to prove effective market hypotheses experimentally, and empirical evidence shows that the stock market can be predictable in some ways.

Chapter 3. Prediction Methods

Prediction methodologies fall into three broad categories which can (and often do) overlap. They are fundamental analysis, Technical analysis (charting) and technological methods.

Fundamental analysis

- Fundamental analysis is a method of determining a stock's real or "fair market" value.
- Fundamental analysts search for stocks currently trading at prices higher or lower than their real value.
- If the fair market value is higher than the market price, the stock is deemed undervalued, and a buy recommendation is given.
- If the fair market value is lower than the market price, the stock is deemed overvalued, and the recommendation might be not to buy or to sell if the stock is held.
- The overall state of the economy
- The strength of the specific industry
- The financial performance of the company issuing the stock.

Sources for Fundamental Analysis

Fundamental analysis uses publicly available financial data to evaluate the value of an investment. The data is recorded on financial statements such as quarterly and annual reports and filings like the 10-Q (quarterly) or 10-K (annual). The 8-K is also informative because public companies must file it any time a reportable event occurs, like an acquisition or upper-level management change.

Technical analysis

Technical analysts or chartists are usually less concerned with any of a company's fundamentals. They seek to determine possibilities of future stock price movement largely based on trends of the past price (a form of [time series analysis](#)). Numerous patterns are employed such as the [head and shoulders](#) or cup and saucer. Alongside the patterns,

techniques are used such as the [exponential moving average](#) (EMA), oscillators, support and resistance levels or momentum and volume indicators. Candle stick patterns, believed to have been first developed by Japanese rice merchants, are nowadays widely used by technical analysts. Technical analysis is rather used for short-term strategies, than the long-term ones. And therefore, it is far more prevalent in commodities and forex markets where traders focus on short-term price movements. There are some basic assumptions used in this analysis, first being that everything significant about a company is already priced into the stock, other being that the price moves in trends and lastly that history (of prices) tends to repeat itself which is mainly because of the market.

Chapter-4 Tool & Technologies

PYTHON

The language of select for this project was Python. This was a straightforward call for many reasons.

1. Python as a language has a vast community behind it. Any problems which may be faced is simply resolved with visit to Stack Overflow. Python is the foremost standard language on the positioning that makes it is very straight answer to any question.
2. Python is an abundance of powerful tools ready for scientific computing Packages. The packages like NumPy, Pandas and SciPy are unit freely available and well documented. These Packages will intensely scale back, and variation the code necessary to write a given program. This makes repetition fast.
3. Python is a language as forgiving and permits for the program that appear as if pseudo code. This can be helpful once pseudo code give in tutorial papers should be required and verified. Using python this step is sometimes fairly trivial. However, Python is not without its errors. The python is dynamically written language and packages are area unit infamous for Duck writing. This may be frustrating once a package technique returns one thing that, for instance, looks like an array instead of being an actual array. Plus the standard Python documentation did not clearly state the return type of a method, this can't lead without a lot of trials and error testing otherwise happen in a powerfully written language. This is a problem that produces learning to use a replacement Python package or library more difficult than it otherwise may be.

NUMPY

Numpy is python package which provide scientific and higher level mathematical abstractions wrapped in python. It is [20] the core library for scientific computing, that contains a provide tools for integrating C, strong n-dimensional array object, C++ etc. It is also useful in random number capability, linear algebra etc.

Numpy's array type augments the Python language with an efficient data structure used for numerical work, e.g., manipulating matrices. Numpy additionally provides basic numerical routines.

Chapter 5 Flow Diagram

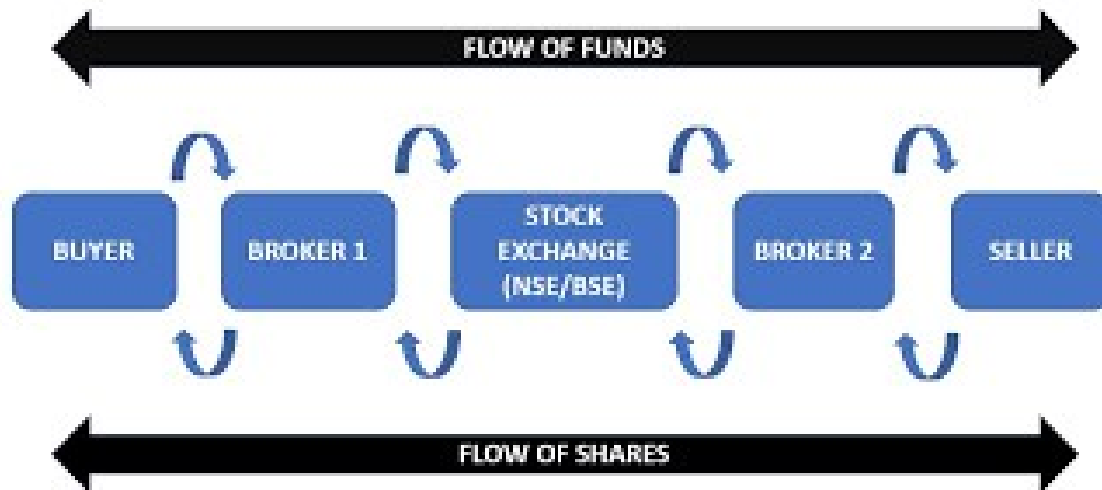


Figure 2

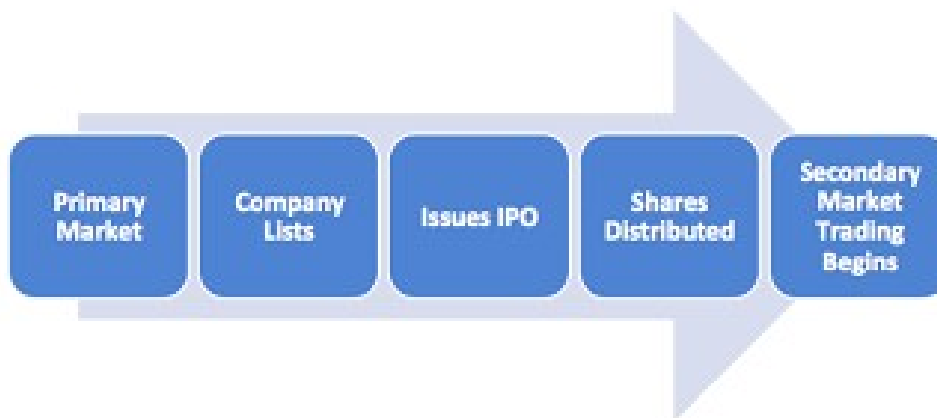


Figure 3

Chapter 6. Conclusion

The importance of the stock market to a country's economy will make the types of stock price forecasting methods continue to develop and grow, and will continue to be derived from the development of other disciplines. In the development process of the follow-up forecasting method, it is necessary to continuously explore and deeply study the characteristics of the stock market, to make the model closer to reality, expand the applicability of the method, and obtain better forecasting accuracy. Because stock data is affected by economic factors, political factors or environmental factors, the law of its change is elusive, and the cycle of the law of change is difficult to determine. Therefore, the model still needs a lot of historical data and selection of appropriate variables for analysis to obtain the desired results. In the traditional ARIMA model, when analyzing complex stock markets, its prediction results are not particularly ideal, and there are still certain errors in price prediction. As a technology in the field of deep learning, neural network can solve non-linear problems well. It uses the information given at a specific instant for prediction. Even if the other two models LSTM and CNN are utilized in a lot of other time-dependent data analysis, it is not outperforming over the Hybrid approach of LSTM and CNN architecture in this case. LSTM neural network is optimized on traditional neural network and introduces the concept of "gate", which enhances the long-term memory ability of the model.

