**Prediction of NEPSE Index Movement Using Technical Analysis**

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**Abstract:**

Due to the nature of the stock and index, predicting index or price movements is a challenging task. The nature of index volatility makes it impossible for investors to profit from stocks. To address this problem, investors need to make accurate predictions about future index or stock price changes. In this study, data has collected for 6 months (December 2022 to May 2023) and technical trading tools such as candlesticks and Google Form Questionnaire Surveys were used to determine the movement of the NEPSE index. A questionnaire survey is completed with 62 answers. Given the Nepalese context and due to the global economic crisis and uncertain political environment, as a result, in a bearish market, the candlestick stick pattern produces mixed results while the trader can benefit from it in the very short term, but sometimes does not provide the right and appropriate movement.

**Key Words:** Index, Movement, NEPSE, Price, Technical Analysis

# Introduction

The process of predicting the future price of a stock traded on an exchange is known as stock market trend forecasting. Technical analysis is a trading tool that uses data from trading activity, such as price movement and volume, to evaluate securities and predict their future movements. According to technical analysis assumptions, price movement and volume follow certain patterns over time (Vaiz & Ramaswam, 2016).

Due to its volatility, predicting the stock market index and its direction has been one of the most interesting and difficult tasks for researchers, data scientists and economists. Although there have been several studies in the literature on predicting stock price indices using various econometric models, only a few studies on predicting their directional movements are available. Accurately predicting the movement of the stock price index is critical to developing accurate market planning (Leung, Daouk, & Chen, 2000).

Stock market forecasting is one of the toughest challenges that have plagued researchers and financial professionals for more than half a century. Technical analysis creates forecasts based on mathematical indicators based on stock prices. The stock market prediction problem is combined in this study with a classification challenge using time-series data. Both technical analysis indicators and sentiment of news reports are used as input (Picasso, Merello, Ma, Oneto, & Cambria, 2019).

The Dow Theory laid the foundation for modern technical analysis. Of the many theorems put forward by Dow, three stand out: discounts on everything price movements are not entirely random, and “What” is important than “Why” (Theory, 2015).

**Research Objective**

The main objective of this study is to find out prediction of NEPSE Index movement using Technical Analysis as well as view of securities traders and investors through the survey questionnaire. A specific objective of this study is to assess whether the technical analysis can identify the movement of NEPSE Index or not? This study will also support to examine the use of technical analysis in Nepal Stock Exchange Ltd., by technical indicator and opinion of respondents.

**Literature Review**

The multimodal and multi-temporal information is then merged using a TRPCA (Tensor Robust Principal Component Analysis) model. Experiments with real datasets show that the proposed tensor representation and fusion approach can significantly improve performance in predicting stock movements (Wang, Hu, Jiang, Tan, & Li, 2023). SVM is a relatively new method that may give better results in the future, whereas LSTM only gives decent results when a large data set is provided, which could be seen as a disadvantage (Sheth & Shah, 2023). Several strategies for predicting stock market behavior have been explored with the aim of mitigating the effects of noisy datasets, non-linearity and randomness in the data. (Dhakar & Shiwani, 2023). Artificial neural network and random forest techniques were used to predict the next day. Standard strategic metrics such as RMSE and MAPE are used to evaluate the models. The low values ​​of these two indicators indicate that the models are effective in predicting stock closing prices (Vijh, Chandola, Tikkiwal, & Kumar, 2020).

To predict price fluctuations in the Chinese stock markets. The experimental results show that our technique outperforms the strongest baselines by at least 2.38% and 4.62%, respectively, in terms of average ACC and MCC. Based on the above features, MAC can predict stock price changes for the following trading day. Extensive testing shows MAC outperforms the most modern underlying in predicting stock price movements, Sharpe ratio and back-testing trading returns (Ma, Mao, Lin, Wu, & Cambria, 2023).

In Malaysia, it is impossible to predict stock prices and trends based on fundamental analysis. Therefore, a strategy model based on historical prices and Stock Technical Indicators (STIs) is required to understand the stock market and future stock trends (Pheng, Chuan, Foong, Yusof, & Singh, 2022).

The rapid improvement in artificial intelligence and machine learning techniques, the availability of large amounts of data, and the improved computational capabilities of machines are enabling the development of sophisticated algorithms to predict stock prices (Bhandari, et al., 2022). The test results show that the LASSO-LSTM, which incorporates technical indicators and sentiment indicators, outperforms the standard LSTM by an average of 8.53%. Proper variable selection can help retain the variables of interest and improve model prediction performance (Yang, Wang, & Li, 2022). The purpose of this research is to forecast Jordanian insurance business using technical analysis methods. The experimental results show that the non-parametric Exponential Decay Weighted Average (EDWA) outperforms some of the more common forecasting algorithms. (Altarawneh, et al., 2022).

Predicting security prices and supporting investment decisions. This study shows how the trading signal generated by this indicator can be used to reduce market trading risk. This study also examines which model is able to increase profitability by incorporating additional criteria to avoid erroneous trading signals. When buying and selling stocks, technical analysis is used to determine the right timing for entry and exit points (Joshi, 2022). Technical analysis helps investors observe the market using various clues that are useful for their research. Technical indicators allow analyzing the short-term price movement of stocks, show the turning point and help in price forecasting (Sagala, Saputri, Mahendra, & Budi, 2020). The technical analysis is generally helpful in predicting future price movements. Technical analysis does not guarantee stock returns, but rather helps investors maximize gains or minimize losses by determining when to enter and exit a stock position (Fisal, 2017). A sample of closing prices for the general index of the Amman Stock Exchanges was used as data for the study. The results show that technical analysis is able to predict price movements and provide profitable buy and sell recommendations (Abbad, Fardousi, & Abbad, 2014).

Indonesian stock market price changes, notably in the banking industry. Discrete-type input has a substantial effect on both the SVM and FKCM approaches, with FKCM achieving 92% accuracy with σ = 100 and 90% with continuous-type input using training data (Rustam, Vibranti, & Widya, 2018).

**Research Methodology**

The design of this research study is based on triangulation mix methods. For this study, secondary data was obtained from numerous books, journals, and websites and used for data analysis. Data from the Nepal Stock Exchange Ltd. is used for the analysis. NEPSE Index used from December 2022 to May 2023. The data analysis is based on the generated chart patterns of the Candles Stick technical indicator.

In contrast, primary data questionnaires are collected online via Google Forms Survey and email, Viber, WhatsApp, Telegram and Messenger. In this survey, 62 people completed and submitted the questionnaire, 12 female and 50 male. Question 20 is used for research purposes in this research study.

In this research for the data analysis computer application Statistical Package for Social Sciences (SPSS), Microsoft Excel Sheet and Technical Chart ([www.nepsealpha.com/trading/chart](http://www.nepsealpha.com/trading/chart)) has been used for analysis purpose.

**Results and Discussion**

1. **Technical Chart (Candle Sticks)**

The figure 1 is chart of Candles Stick, almost in technical chart there are near about 42 recognized candles stick pattern are formed in chart. But here is discussed about formed candles stick pattern in chart of last 6 months (December 2022 to May 2023).

Figure 1: NEPSE Index Candle Chart



Sources: https://nepsealpha.com/trading/chart

The primary highlights and some evolved patterns of candlesticks have been noted in number in the preceding Figure 1: Chart. The findings of the above chart in No. 1 and No. 7 Hammer patterns have formed, indicating that the market will move upward in the next few days. The candlestick market opens with a price move down and then closes with a price rise up. The candle with a small body and a long tail is known as a hammer candle or a hanging man. Similarly, if a small body develops at the bottom of a candle and it has a long tail on the upside, it is known as an inverted hammer or shooting star candle, as seen in nos. 3, 4, and 5. Shooting star candles mean market prices move in downtrends.

Again in the chart, the candlesticks form green and red Marubozu candlesticks in nos. 2, 6, and 10. Green Marubozu signifies that the market index is rising, while red shows that the index is falling. Adding three candlesticks to no. 3 and 5 creates an Evening Star pattern, indicating a market decline. In other words, the formation of a Morning Star pattern in hands 9, 11, and 12 indicates that the market is moving upward.

1. **Primary Data (Google Form Survey)**

Figure 2: Prediction of Price Movement Male and Female

Sources: Google Form Survey

The above Figure 2 of male and female involvement in price movement prediction shows that there are 50 total males, with 5 responding that technical analysis cannot anticipate price movements and the remainder responding that technical analysis can forecast price movements. However, there are 12 female respondents, with 10 saying technical analysis can forecast price movement and 2 saying it cannot predict price movement. If, in percentage terms, 90% of guys agreed with the prediction of price movement and just 10% of males disagreed with the prognosis of price movement, Females, on the other hand, are 83.33% certain that price movement prediction can be done using technical analysis, while 16.67% are not convinced that price movement forecasting can be done using technical analysis.

Figure 3: Prediction of Price Movement Respondents

**Sources: Google Form Survey**

Figure 3 depicts respondents' predictions of price movement; of the 62 total respondents, 55 agreed with technical analysis, which can forecast the price and index movement of the stock market. Despite the fact that 7 respondents stated that technical analysis cannot predict price and index movement in Nepal's stock market, in terms of proportion, 88.70% are fully confident in technical analysis to forecast movement, while the remaining 11.30% are not confident in technical analysis.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item** | **N** | **Mean** | **Std. Deviation** | **Variance** |
| Prediction of price movement | 62 | 1.11 | 0.319 | 0.102 |

Table 1: Descriptive Statistics of Prediction of Price Movement by Technical Analysis

**Sources: Google Form Survey**

There are a total of 62 observations (N). The mean, which in this case is 1.11, represents the average value of the data set. It denotes the main trend of price movement forecasts. The standard deviation of 0.319 quantifies the variability, or spread, of the predictions about the mean. It quantifies how far individual forecasts deviate from the average and provides information about the distribution of the data. The variance is 0.102 and is another measure of data scatter. It is the arithmetic mean of the squared differences between each prediction and the mean. Variance is used to get a better understanding of predictability. In summary, the statistics provided reflect a data set of 62 price movement predictions. The mean predicts the mean, but the standard deviation and variance anticipate the variability or spread of the forecasts around the mean.

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**Conclusion**

Predicting price or index movements is one of the most difficult challenges in the stock market of Nepal. This is conceivable with the help of technical indicators, but not certain in the context of the current economic and political situation in Nepal. However, the results of the candlestick pattern have been inconsistent over the short term, as illustrated by the 6-month technical chart of the figures. Since somewhere the candlestick pattern was not genuine, the trader or investor may have to face losses.

However, according to data collected via Google Form, the majority of respondents (55 out of 62) agreed with technical analysis used to predict price and index movements in the stock market. The standard deviation suggests that the predictability of prices and indices was moderate. The mean predicts the mean, while standard deviation and variance anticipate the predicted spread or variability around the mean. Why does technical analysis in the context of the Nepal stock market scenario lead to conflicting conclusions?

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