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A study on candlestick patterns and volume analysis on market indexes with reference to Nifty 50 and Sensex

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Abstract
This study analyzes candlestick patterns and volume behavior within the Nifty 50 and SENSEX over a one-year period using NSE and BSE data. It identifies recurring technical patterns, evaluates their reliability, and examines how volume confirms or contradicts price movements. Through statistical analysis, the research compares the effectiveness of technical analysis across both indices. The findings offer insights into the predictive power of candlestick patterns, providing valuable implications for investors and traders. This study adds empirical evidence to the literature on technical analysis in Indian equity markets.

Keywords: Candlestick patterns, technical analysis, volume behavior, nifty 50, Sensex

Introduction

Nifty 50 is a diversified index that includes 50 leading stocks representing sectors of the Indian economy. Introduced on April 22, 1996, with a base date of November 3, 1995, and a base value of 1000, Nifty 50 has become an exhaustive market benchmark. Its universe consists of index funds (both domestic and international mutual funds and ETFs) and futures and options listed on the NSE and the NSE International Exchange (through GIFT Nifty). The index is about 55.48% of free-float market capitalization of all NSE-listed shares as of March 28, 2025. Nifty 50 constituents shared around 30.21% of total traded value on the NSE for the six months ended March 2025. Since June 26, 2009, the index has been computed on the free-float market capitalization-weighted approach, whereby the level of the index represents the aggregate free-float market capitalization of its constituent stocks. It is updated semi-annually in March and September based on six-month average figures as of January 31 and July 31, respectively. The Nifty 50 indexes the nation's leading 50 blue-chip firms in various industries, and the weight of each stock is based on its free-float market capitalization. Sensex, or S&P BSE Sensex, is the market benchmark of the Bombay Stock Exchange (BSE). It was launched on 1 January 1986 and includes the largest and most financially sound 30 firms listed on the BSE. The term 'Sensex' combines 'sensitive' and 'index,' a name coined by market expert Deepak Mohini. The Sensex is also a free-float market capitalization-weighted index, serving as a key indicator of the Indian stock market's performance through its basket of 30 well-established blue chip companies

Literature review

Anusha S Sangondimath *et al*. The June 2025 article entitled "Analysing Hammer Candlestick Patterns on NIFTY 50: A Technical Perspective" analyzes the forecasting ability of the bullish hammer candlestick pattern on the NIFTY 50 index for the period 2019 to 2024. It measures the frequency and hit ratio of the hammers when they do indeed forecast a short-term price reversal and evaluates average returns and risk-reward ratios subsequent to their occurrence. The paper also examines how the reliability of hammer signals differed at major market events, specifically the COVID-19 crash, and found that performance declined at the most volatile times but otherwise remained statistically significant. The paper generally concludes that although the hammer patterns are crucial in providing insights for short-term trading decisions in NIFTY 50, their effectiveness is dependent on context and hugely leverages confirmation by other indicators.

Kavya GP *et al*. The article "Candlestick Patterns Trading Strategies: A Systematic Review" gives a detailed description of how traders employ candlestick patterns in technical analysis to forecast market direction and formulate trading strategies. It starts with the explanation of the history and background of candlestick charts, whose origins are traced to Japan and still hold their ground as a popular method of depicting market mood in terms of the open, high, low, and closing prices over a specified period. The article deals with popular patterns like the hammer, doji, morning star, and hanging man, explaining their functions in foretelling trend reversals, continuations, or indecision. Although candlestick patterns can be useful tools, the paper underlines their shortcomings, *viz.*, subjectivity, the basis on past data, and possibility of false signals if applied in isolation. Multiple trading strategies such as trend trading, reversal trading, and breakout trading, and scalping are discussed, as well as results that using multiple patterns and risk management methods typically enhances performance. The research ends by suggesting traders use candlestick analysis in conjunction with other technical indicators, remain adaptable to market trends, backtest strategies to verify them, and remain in a state of continuous education to better their trading results.

Objectives of the study
- To analysis the candlestick patterns in NIFTY50 and SENSEX stocks.
- To understand about price action candlesticks

Methodology
Historical data for the research is obtained from websites of NSE and BSE. It is more than 1 year's data (i.e., June 2024 till June 2025), and the time frame in the data is 1 day. Technical tools chosen for analysis as candlestick patterns and combination of volume.

Tool selection
Tool types used for analysis
- Fundamental.
- Technical.
- Option Greeks.
- **Fundamental analysis:** Stock fundamental analysis is a technique used to ascertain the underlying value of a company according to its financial strength, industry performance, and general economic situation. It assists investors in ascertaining whether a stock is fairly valued, undervalued, or overvalued and directs their sell, hold, or buy. It contrasts with technical analysis, which uses price charts and volume of trade.
- **Technical analysis:** Technical analysis is a technique of studying statistical patterns within trading activity, most commonly price movement and volume. It's applied to spot trading and investment scenarios. Technical analysis is not trying to study the value of an asset based upon financial data like earnings and sales, unlike fundamental analysis. Technical analysis does its best to make conclusions about future price action through the use of price and volume.
- **Option Greeks:** Option Greeks constitute a group of option measures employed in options trading that assist in quantifying the sensitivity of an option price to various parameters like the price of the underlying

asset, time, volatility, and interest rates. Option Greeks provide information on how an option price may react to various market conditions and are of utmost importance to risk management and making good trades.

Types of technical tools
1. Chart Patterns
- **Trend lines:** Lines connecting a series of highs or lows in prices to reflect the direction of the trend (up, down, or sideways).
- **Support and Resistance Levels:** Price levels at which buying and selling pressures will be great and lead to a reversal.
- **Candlestick Patterns:** Visual description of the price action during a specific time frame, reflecting market sentiment and an impending reversal. Some patterns include doji, hammer, and engulfing patterns.
- **Chart Patterns:** Specific shapes such as head and shoulders, triangles, and flags that may signify probable price breakouts or continuations of trends.

2. Technical Indicators
- **Moving Averages (SMA, EMA):** Compute the average price for a given interval of time, smoothing out the price oscillations and representing trends.
- **Relative Strength Index (RSI):** Compares the size of recent price changes in order to establish overbought or oversold situations.
- **Moving Average Convergence Divergence (MACD):** A momentum-following trend oscillator showing the difference between two moving prices of a security.
- **Stochastic Oscillator:** Comes in and compares closing price of a security to its price range over a specified period.
- **Bollinger Bands:** Employ a moving average and standard deviations to locate possible price volatility and overbought and oversold points**.**
- **Parabolic SAR:** Utilized to calculate possible trend reversals and stop-loss points.
- **On-Balance Volume (OBV):** Reflects buying and selling pressure in volume and price movement.
- **Fibonacci Retracement:** Uses Fibonacci numbers to determine possible support and resistance levels.
- **Candlestick price action:** Its price action analysis by the application of candlestick patterns, and candlestick patterns are great trading tools. The patterns are useful in anticipating future price action and reflect market psychology. There are several of the most popular candlestick patterns familiar to traders like doji, hammer, and engulfing patterns that can be employed to spot potential reversals or continuations of the price trend.
- **History of Candlestick:** Candlestick charts are said to have originated in the 18th century when Munehisa Homma, a Japanese rice trader, created them. They were introduced to the Western world by Steve Nison, whose book Japanese Candlestick Charting Techniques first appeared in 1991.

Analysis & Results Discussion
Analysis on Market Indices with a time frame of 1day and back tested for 1 year from January 2024-January 2025.

Nifty50
Hammer
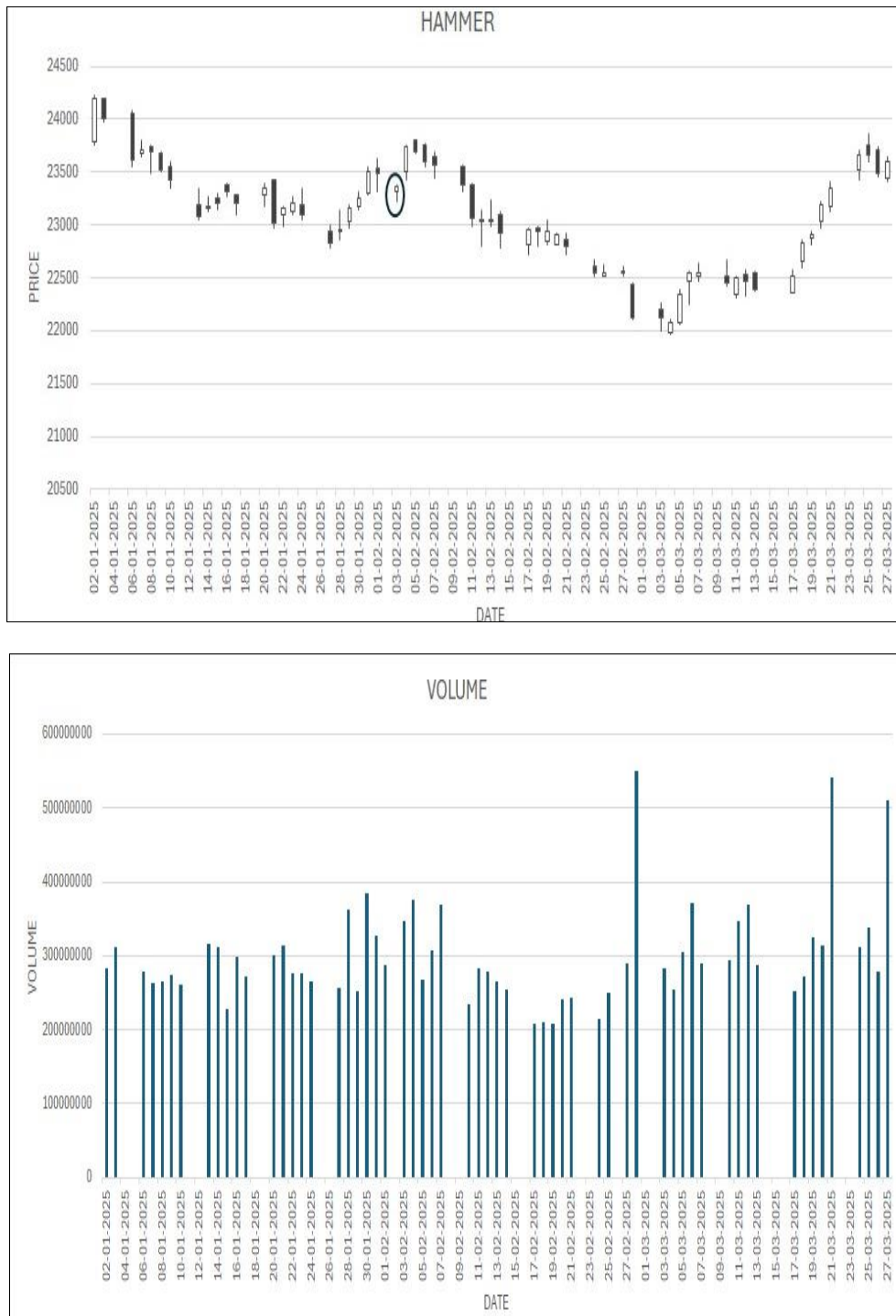
Hammer is a single candlestick pattern that is formed at the end of a downtrend, and it signals a reversal of the trend to bullish. The real body of this candle is small and is located at the top with a down wick, which should be more than twice the size of the real body. This candlestick chart pattern may contain little upper shadow or none. The psychology behind this candle formation is that when the prices opened, sellers pushed down the prices, but the buyers came into the market and pushed the prices up and closed the trading session more than the opening price. This is formed on February 3 2025, timeframe of 1 day, Y-axis represents the share price of the NIFTY 50 and X-axis represents the date.

hammer pattern is formed with open price of 23320, high of the day is 23380, low of the day is 23220 and close price is 23360 on 4th February the price is bullish and continued to next day of high 23790 up to previous high. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the hammer pattern the volume is 347.24mn and the volume is risen to 376.7mn which gives conformation of trend reversal with pattern.

Piercing Pattern
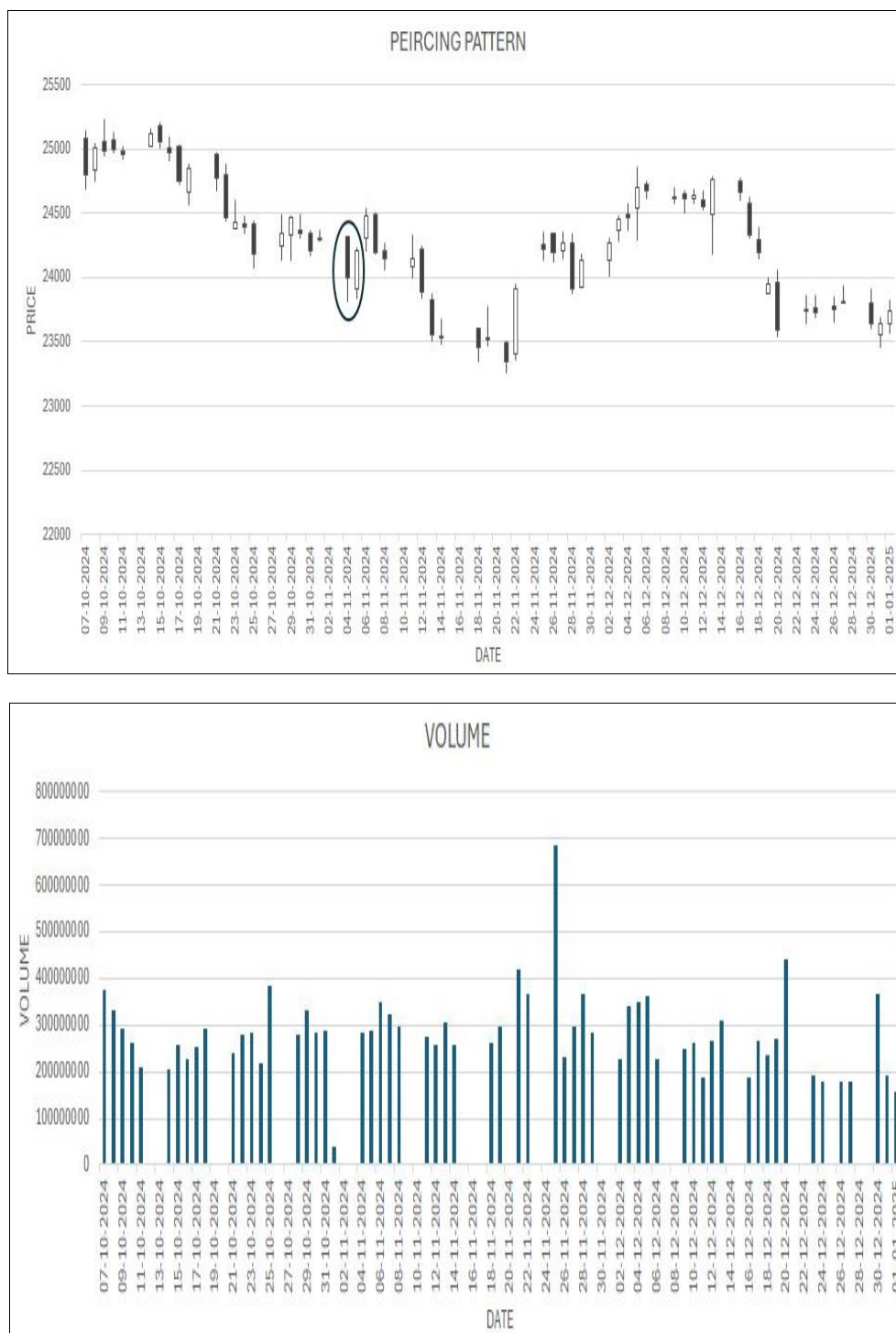
Piercing pattern is two candlestick chart pattern that is formed after a downtrend indicating a reversal of trend. It is formed by two candles, the first candle being a bearish candle which indicates the continuation of the downtrend. The second candle is a bullish candle that opens a gap down but closes more than 50% of the real body of the previous candle, which indicates that the bulls are back in the market and a bullish reversal is confirmed. This is formed on November 4 2024, timeframe of 1 day, Y-axis represents the share price of the NIFTY 50 and X-axis represents the date. peircing pattern is formed bearish candle on November 4 2024 with open price of 24315, high of the day is 24316,

low of the day is 23816 and close price is 23995. on next day bullish candle formed (November 5 2024) with open price of 23916, high of the day is 24230, low of the day is 23842 and close price is 24213 the price is bullish and continued to next day of high 24308 up to previous high. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the piercing pattern the volume is 285.31mn and the next day volume is risen to 289.51mn which gives conformation of trend reversal with pattern.

**3. White Marabozu**

WHITE MARUBOZU

VOLUME
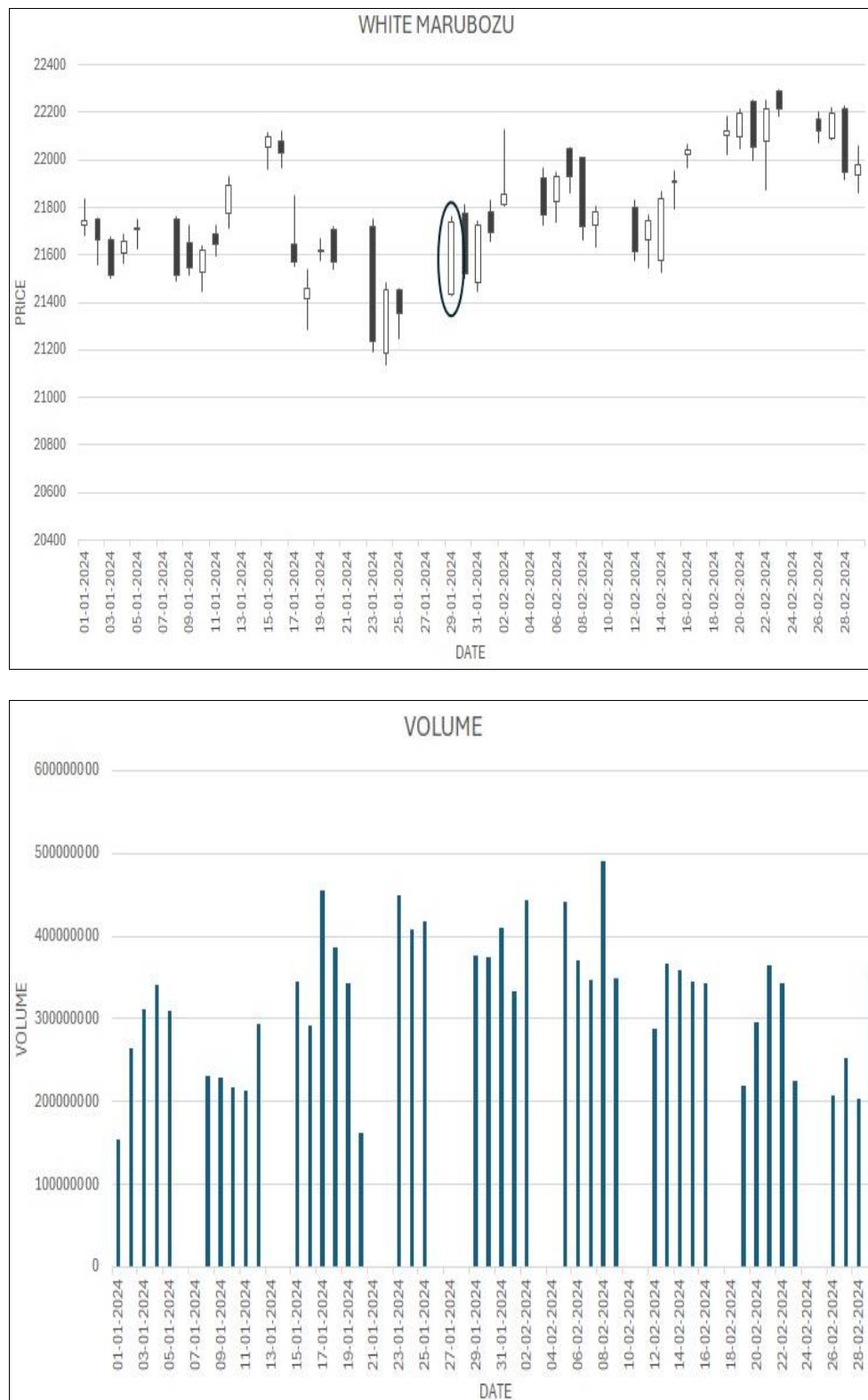
The White Marubozu is a single candlestick pattern that is formed after a downtrend indicating a bullish trend. This candlestick has a long bullish body with no upper or lower wicks which shows that the bulls are increasing buying pressure, and the markets turn bullish. This is formed on 29 January 2024, timeframe of 1 day, Y-axis represents the share price of the NIFTY 50 and X-axis represents the date. White marubozu pattern is formed with open price of 21433, high of the day is 21763, low of the day is 21429 and close price is 21737 on 2nd February the price is bullish and continued to next day of high 21812 up to previous high. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the hammer pattern the volume is 376.70mn and the volume is sustained at that level which gives conformation of trend reversal with pattern.

4. Black Maraozu
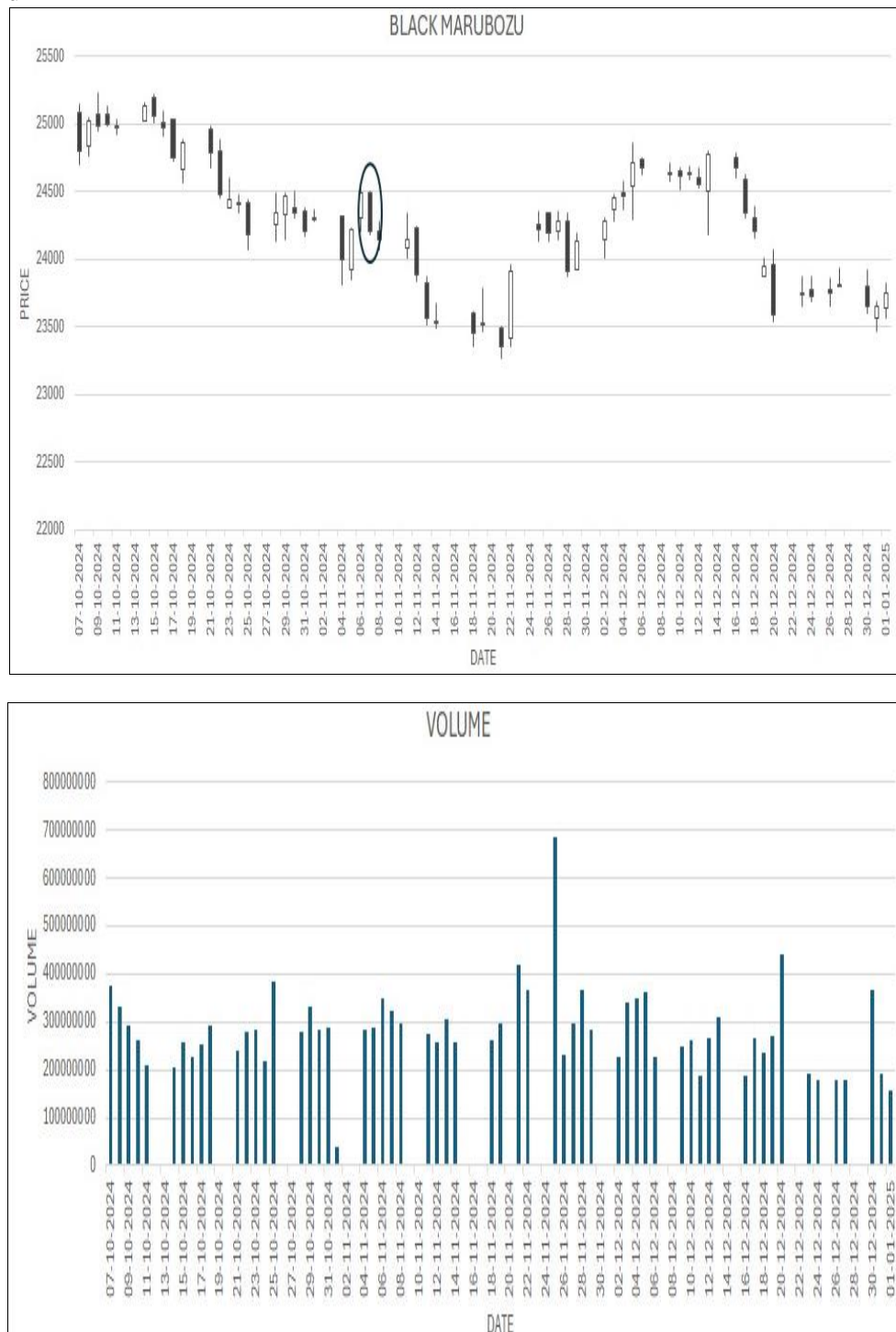
The Black Marubozu is a single candlestick pattern which is formed after an uptrend indicating upcoming bearish trend. This candlestick chart has a long bearish body with no upper or lower wicks which shows that the bears are INC selling pressure and the markets turn into bearish. At the formation of this candle, the buyers should be caution and close their buying position. This is formed on November 7 2024, timeframe of 1 day, Y-axis represents the share price of the NIFTY 50 and X-axis represents the date. Black maruboz pattern is formed with open price of 24490, high of the day is 24500, low of the day is 24180 and close price is 24200 on November 21 2024 the price is bearish and continued up to previous low 23280. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the black marubozu pattern the volume is 322.24mn and the volume is in average of 276.7mn till fall completed.

5. Shooting Star
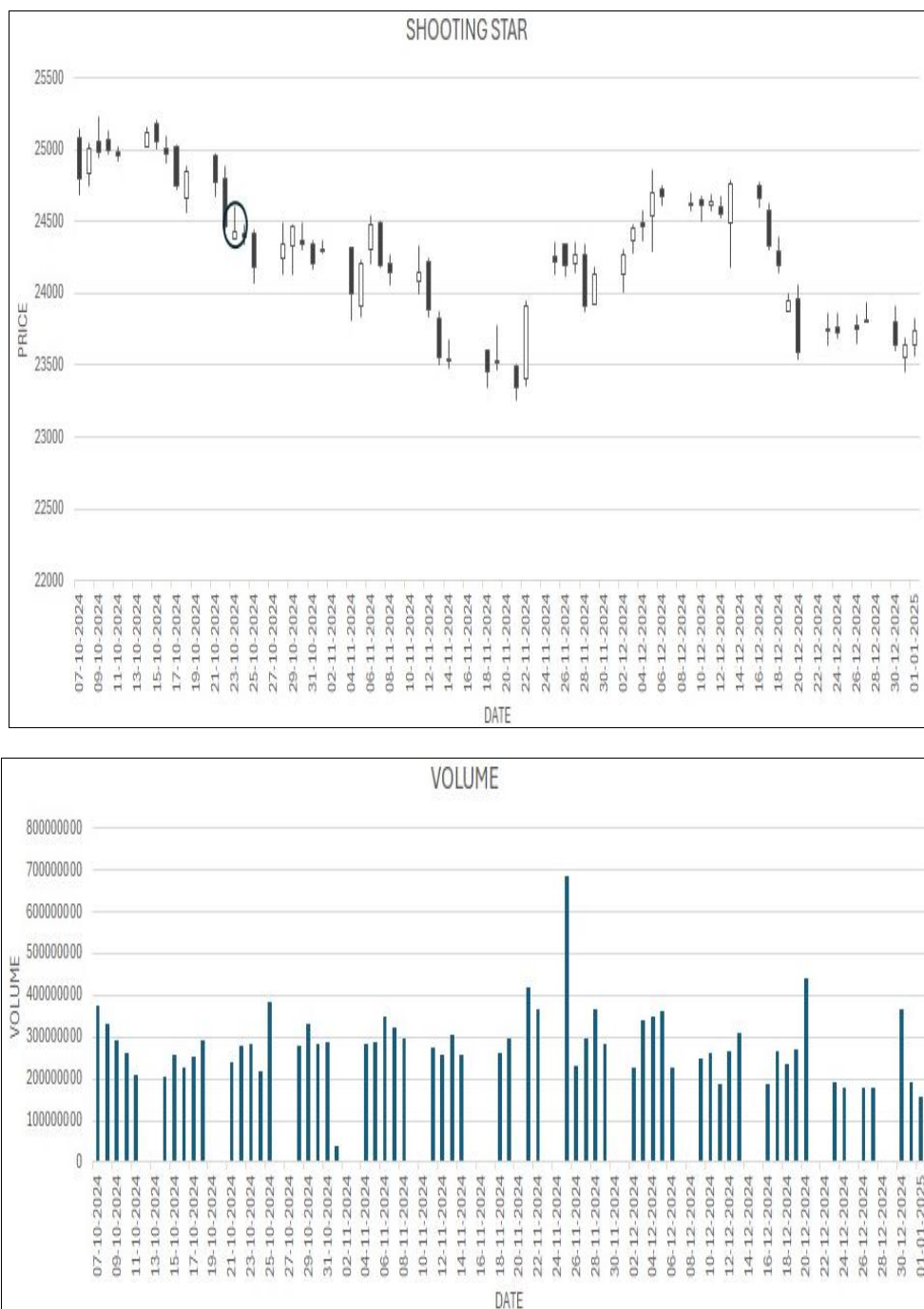
Shooting Star is formed at the end of the uptrend and gives bearish reversal signal. The candlestick chart represents real body is located at the end and there is long upper wick. This pattern is formed when the opening and closing prices are near to each other and the upper wick should be more than the twice of the real body. This chart is formed on October 23 2024, timeframe of 1 day, Y-axis represents the share price of the NIFTY 50 and X-axis represents the date. Shooting star pattern is formed with open price of 24380, high of the day is 24600, low of the day is 24378 and close price is 24430 on 3rd November the price is bearish and continued to next day of low of the 24315 up to previous high. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the hammer pattern the volume is 284.55mn and the volume is sustained which gives conformation of trend reversal with pattern
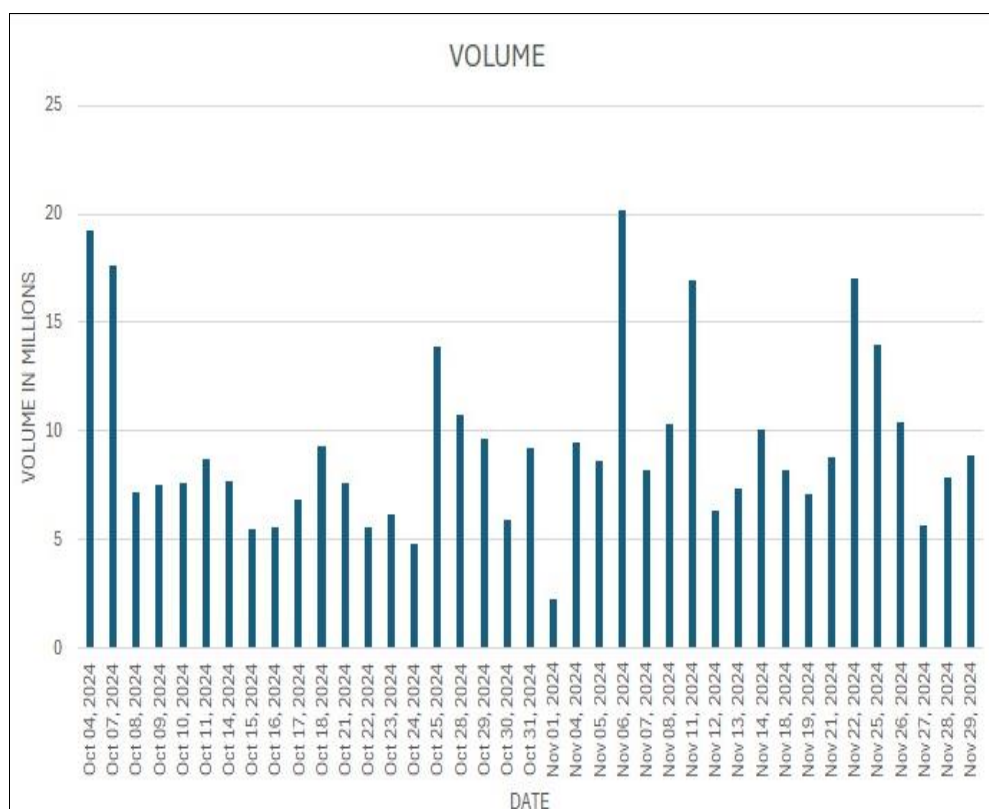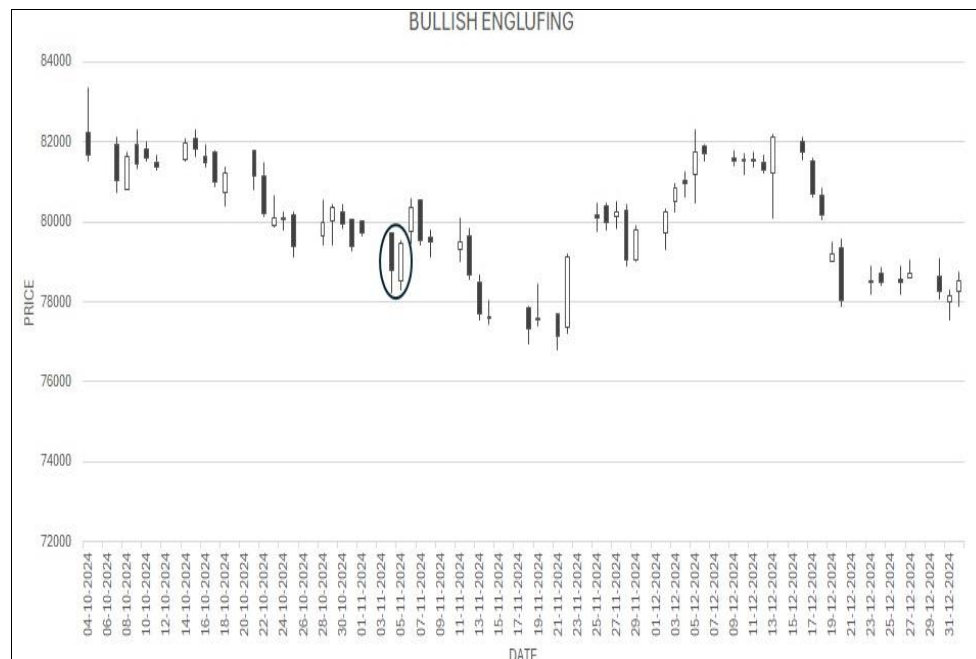
6. Bearish Engulfing

BEARISH ENGULFING

VOLUME
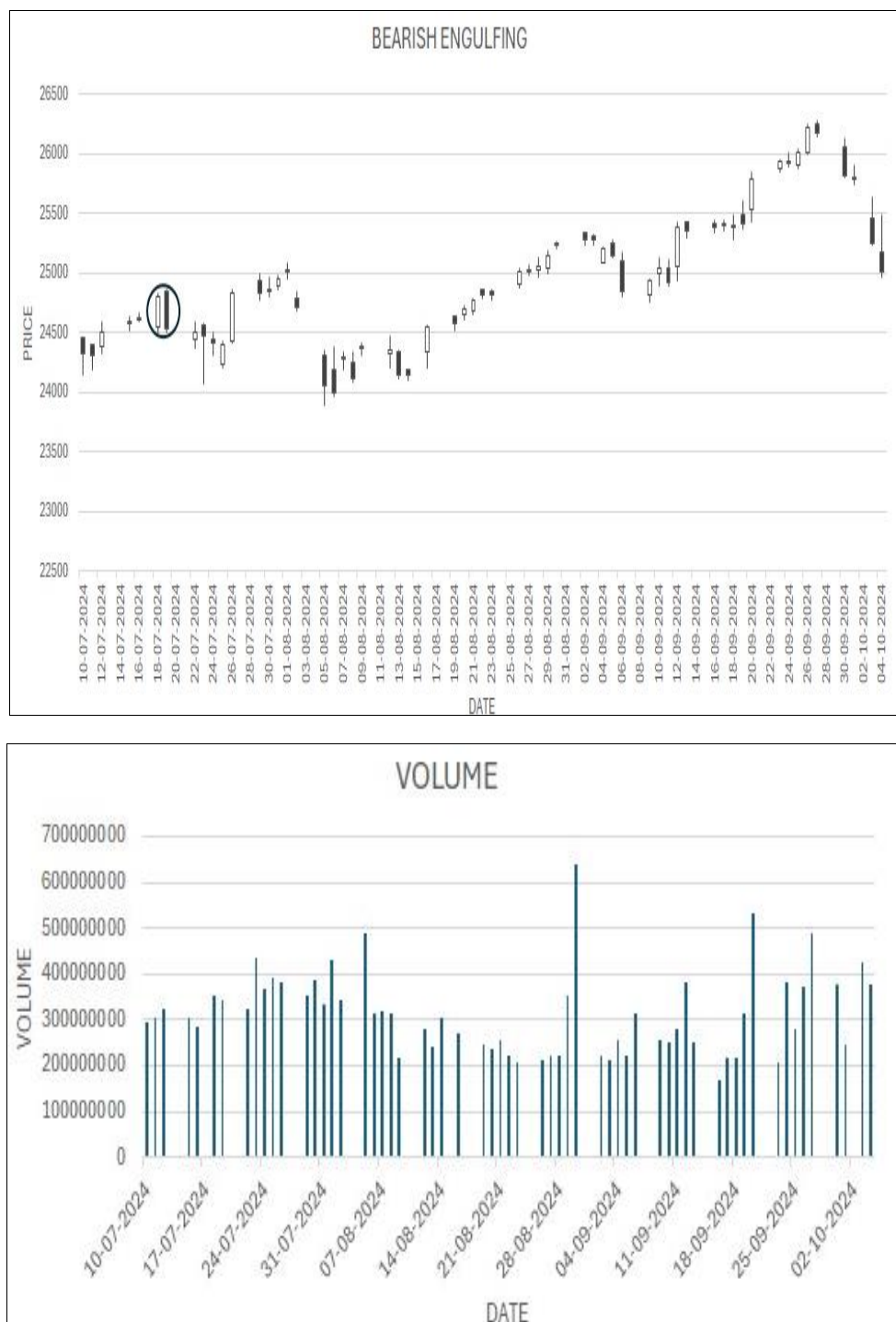
Bearish Engulfing is a two candlestick pattern that is formed after an uptrend indicating a bearish reversal. It is formed by two candles, The first candle being a bullish candle indicates the continuation of the uptrend and The second candlestick chart is a long bearish candle that completely engulfs the first candle and shows that the bears are back in the market. This is formed on July 18 2024, timeframe of 1 day, y-axis represents the share price of the NIFTY 50 and x-axis represents the date. Bearish engulfing pattern is formed bearish candle on July 18 2024 with open price of 24545, high of the day is 21763, low of the day is 21430 and close

price is 21735. on next day bearish candle formed (July 19 2024) with open price of 24545, high of the day is 24855, low of the day is 24508 and close price is 24530 the price is bearish and continued to next day of low 24082 up to previous low. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the piercing pattern the volume is 350.92mn and the next day volume is risen to 343.77mn which gives conformation of trend reversal with pattern

Sensex
Bullish Engulfing

Bullish Engulfing is a two candlestick chart pattern that is formed after a downtrend indicating a bullish reversal. It is formed by two candles, the first candle is a bearish candle that indicates the continuation of the downtrend. The second candlestick is a long bullish candle that completely engulfs the first candle and shows that the bulls are back in the market. This is formed on November 4 2024, timeframe of 1 day, Y-axis represents the share price of the SENSEX and X-axis represents the date. Bullish engulfing pattern is formed bullish candle on November 4 2024 with open price of 79713, high of the day is 79713, low of the day is 78232

and close price is 78782. on next day bullish candle formed (November 5 2024) with open price of 78542, high of the day is 799523, low of the day is 78296 and close price is79476 the price is bullish and continued to next day of high 79771 up to previous high. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the piercing pattern the volume is 9.48mn and the next day volume is risen to 8.62mn which gives conformation of trend reversal with pattern

Three White Soliders
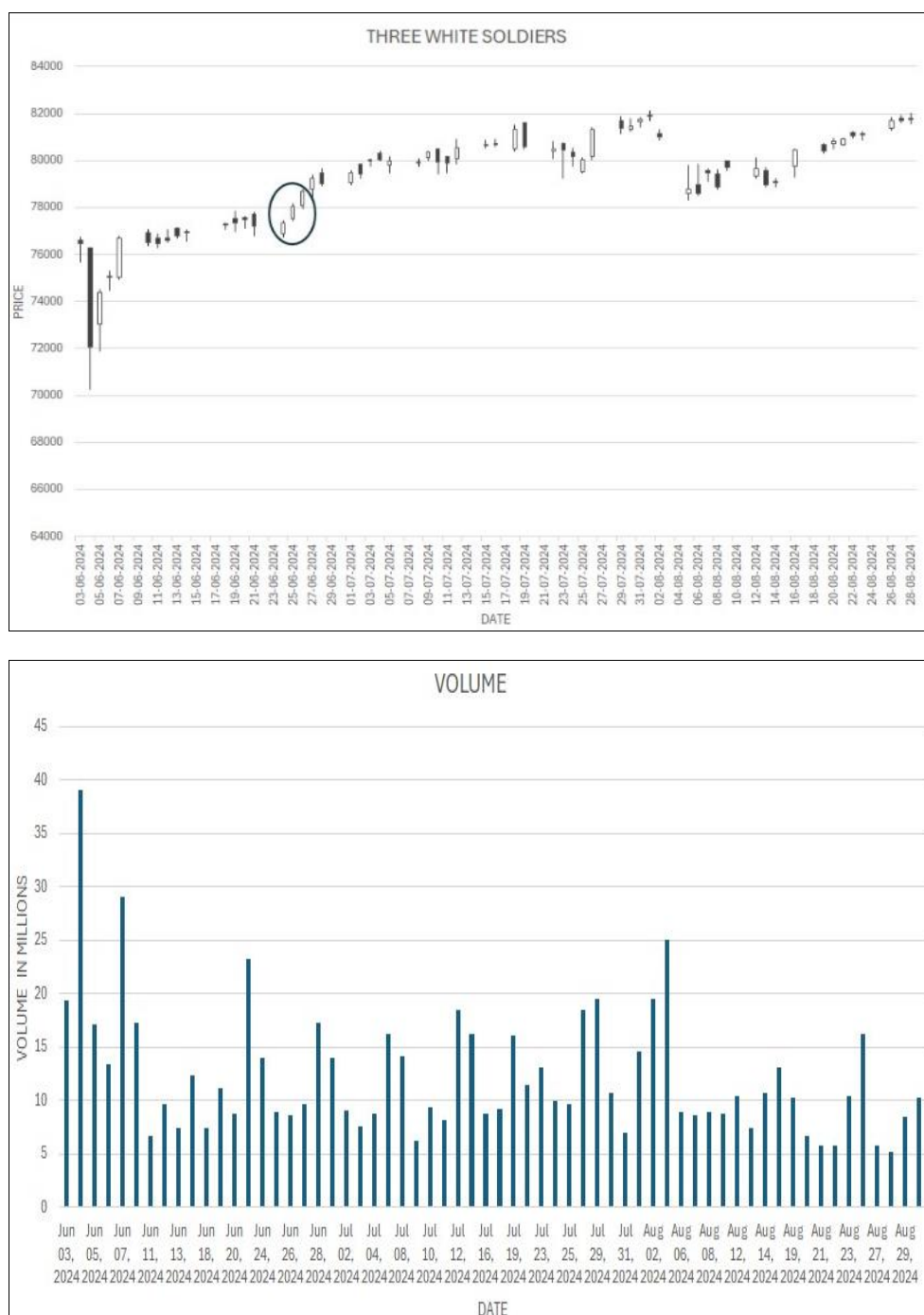
The Three White Soldiers is a three candlestick pattern that is formed after a downtrend indicating a bullish reversal. These candlestick charts are made of three long bullish bodies which do not have long shadows and are open within the real body of the previous candle in the pattern. This is formed on June 24 2024, timeframe of 1 day, Y-axis represents the share price of the SENSEX and X-axis represents the date. Three white soldiers pattern is formed bullish candle on June 24 2024 with open price of 76880, high of the day is 77400, low of the day is 76750 and close price is 77350 on next day bullish candle formed (June 25 2024) with open price of 77530, high of the day is 78160, low of the day is 77460 and close price is 78050. on following day bullish candle formed (June 26 2024) with open price of 78090, high of the day is 78760, low of the day is 77950 and close price is 78670 the price is bullish

and continued until 19 July 2024 81585 up to previous high. Volume chart indicates the number of trade exchange done. Y-axis represents the volume and X-axis represents the date in 1 day timeframe. During the three white solider pattern the volume for 1st candle 13.91mn,2nd candle 8.83mn and the next day volume is to 8.51mn which gives conformation of trend reversal with pattern.

Implications of the study
1 Volatility
- Compared to SENSEX the NIFTY 50 have less volatility due to more diversification, During expiry date the volatility will be more
- Healthy levels of volatility are essential for profitable trading.

2 Bearish candlesticks
- **Bearish Engulfing:** Indicates the breakdown of bullish momentum to bearish.
- **Shooting star:** It indicates the reversal movement.
- **Black marubozu:** It indicates the downtrend.

3 Bullish candlesticks
- **Bullish Engulfing:** Indicates the breakdown of bearish momentum to bullish.
- **Hammer:** It indicates the reversal movement.
- **Three White Soldiers:** supports the bullish moment
- **White marubozu:** It indicates the uptrend.

4 Purpose of candlesticks
- Candlesticks patterns are tools used to predict the price movement based on the historical behavior.
- They help trades determine potential entry and exit points, as well as risk management levels.

5 Key price points of candlesticks
Candlestick indicates Open, High, Lw, Close (OHLC) in the given time frame
- **Open:** The first traded price of an asset during the time.
- **High:** The highest price traded during the time period.
- **Low:** The lowest price traded during the time period.

Conclusion
From the above research that candlestick patterns are useful for short-term price movement analysis of the NIFTY 50 and SENSEX indexes. The results show that certain patterns like Hammer, Bullish Engulfing, three white soldiers, and White Marubozu are indicators of bullish reversals, while bearish reversals are indicated by patterns such as Bearish Engulfing, Shooting Star, and Black Marubozu. The time frame as taken as 1day and for period of 1 year (i.e., June 2024 to June 2025) The findings also indicate that the NIFTY 50, being more diversified, shows marginally lower volatility than the SENSEX, save on expiry dates when volatility rises. Candlestick pattern analysis, in general, combined with volume data and aided by other technical indicators, can improve decision-making for traders and investors by indicating market trends and possible reversals in prices.

References
1. Nison S. Japanese candlestick charting techniques. 2nd Ed. New York: New York Institute of Finance, 2001.
2. Murphy JJ. Technical analysis of the financial markets: a comprehensive guide to trading methods and applications. New York: New York Institute of Finance, 1999.
3. Lo AW, Mamaysky H, Wang J. Foundations of technical analysis: computational algorithms, statistical inference, and empirical implementation. J Finance. 2000;55(4):1705-1765. https://doi.org/10.1111/0022-1082.00265
4. Brock W, Lakonishok J, LeBaron B. Simple technical trading rules and the stochastic properties of stock returns. J Finance. 1992;47(5):1731-1764. https://doi.org/10.1111/j.1540-6261.1992.tb04681.x
5. Patel JB, Patel HB, Patel DP. An empirical testing of technical analysis patterns: Evidence from Indian stock market. Indian J Res Cap Mark. 2015;2(4):22-30.
6. Hudson R, Dempsey M, Keasey K. A note on the weak form efficiency of capital markets: the application of simple technical trading rules to UK stock prices 1935 to 1994. J Bank Finance. 1996;20(6):1121-1132.
7. Zhu Y, Zhou G. Technical analysis: an asset allocation perspective. Financ Anal J. 2009;65(2):21-35. https://doi.org/10.2469/faj.v65.n2.5
8. Chong TTL, Ng WK, Liew KS. Revisiting the performance of MACD and RSI oscillators. J Risk Financ Manag. 2010;3(1):52-65. https://doi.org/10.3390/jrfm3010052
9. Caginalp G, Laurent H. The predictive power of price patterns. Financ Anal J. 1998;54(3):70-78.
10. Sujatha R, Rao DN. A study on predictive accuracy of technical analysis using candlestick chart patterns in Indian stock market. Int J Econ Financ Issues. 2016;6(S3):136-141.
11. Chakraborty M. Profitability of candlestick charting patterns in Indian stock market: a study of select stocks. Asian J Res Bank Finance. 2012;2(4):63-76.
12. Ranjit K, Benerji S. An empirical analysis of volume and price relationship in Indian stock market. Int J Manag. 2020;11(7):435-444.