



## ROLE OF INDICATOR USED IN THE PRICE PREDICTION OF STOCK MOVEMENT

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### Abstract

A fast and accurate development is taking place in the world of electronic stock market. Speed, accuracy, time are the important parameters as well as challenges in trading. Developing a strategy which handle all these challenges and also overcome the human emotions at the same time is really a challenging task. This paper provides the different techniques used in algorithmic trading, impact of algorithmic trading on Indian stock market and various issues which affect the performance of stock in real market.

**Keywords:** Bollinger Bands, Arbitrage Market, Algo trading, Moving Averages, VWAP indicator.

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## 1. INTRODUCTION

The stock market[1] is highly popular investments because of its high profit. As the enormous of contributing and trading developed that is the reason numerous individuals' devices and technique which help to expand their benefit by limiting the danger. In India a large portion of the exchanging happens on its two stock trades: the National Stock Exchange (NSE) [2],[3] and the Bombay Stock Exchange (BSE). The other two driving Indian Markets are Sensex and Nifty. Many Traders also work on Commodity market and currency market. Physical trading floors are highly risky for human traders because of volatility in Market. Prices of stocks are affected by the arrival of news information, big deals by any big traders or by any Institute (High volume and intensity weighted trading) and as these are unpredictable so it difficult to obtain large profits in trading as well as it is difficult to predict whether to purchase stocks or hold them in portfolio[4],[5] for the long period or for short period. An important factor which helps in the trading decisions is the ability to predict stock movement in the live market[6]. If we able to forecast the future behavior of stock which help to stop possible losses on the buy or sale operations in the exchange market. Live market stock prediction[7],[8],[9],[10] is a really challenging task and complicated for investors because of the complexity of the stock market increases because of its faulty and volatile environment, which is related with the strong connection to numerous factors such as quarterly and annual reports, political events, news. Many traders have studied the future market movements. Stock price forecast[11] framework based on various time-series analyses[5] which have been utilized in numerous works where the price of the stock movement is dependent on old cost. For this analysis, a number of forecasting algorithms are analyzed to build a prediction model. The role of forecasting model used in algo trading is to predict the next day market price based on daily and monthly chart analysis. To obtain features of the market for learning is critical because of rapidly changing financial data. Again how to adjust the trading strategy[7] dynamically in the volatile market is a question. Finance market[9] is a fast growing area where Information technology (IT) plays a vital role to execute the trade online. By using technology Algo trading are executed by many traders. Algorithmic trading is a advance research subject in the stock market and has been broadly studied in modern artificial intelligence time. Algo trading[12] is used by either individual

investors or institutional investor; because of strong demand and feathers, trading algorithms are widely utilized in the volatile trading market. Algorithmic trading is a computer programmed which is designed to place a trade in order to make the profit in live market at a speed and frequency which is not possible for a human trader. The defined algorithm is based on market sentiments, quantity, timing, price or any mathematical prediction model. Algo-trading provides more liquidity in live market and exchanging more systematic by minimizing the impact of human feelings[1] on trading. Algorithmic trading makes use of complex mathematical equations, along with prediction Major headings should be typeset in boldface with the first letter of important words capitalized.

## 2. RELATED WORK DONE:

In this section, we review the related work done in past. In stock market, studies found on used Reinforcement Learning (RL) that is a general category of algorithms within the field of Machine Learning (ML)[16]. This RL permits associate agent to find out the way to behave during a random and presumably unknown atmosphere, wherever the sole feedback consists of a scalar reward signal. The aim of the bargainer is to find out by Trial-and-Error. [1] Method that actions maximize his semi-permanent rewards. However, the bargainer should balance his need to get an outsized immediate profit by acting covetously and also the opportunities that may be out there within the future. The planned RL algorithms will be seen as process ways to unravel serial call issues by directly interacting with the atmosphere. The author has conjointly used Andre Markov call Processes. Associate MDP may be a random phase space. Serial call issues area unit usually formalized victimization Andre Markov call Processes (MDP). The author has explained feedback mechanism between the atmosphere and also the agent is illustrated in Figure one. At any time step, the agent selects his actions in step with a definite policy. [2] In this paper author has steered a completely unique approach of mixing the Andre Markov call method and Reinforcement Learning alog with sentiments created by the varied sources like News, political event or historical worth movement that have massive impact on the securities market associated supply this extra info for higher learn an best policy/strategy. so the milliliter agent not just about learns associate best commercialism strategy supported historical costs[14] however conjointly on extra info supported sentiment associated trend of the market to create an enlightened call. The author has thought of five year daily historic information from

yahoo finance. The author has used Andre Markov call method (MDP).[17] This paper additional elaborates on however the MDP is solved by learning associate best policy victimization Q-learning[17] with useful approximations. The author has conjointly used the indications and Neural Network to search out trend info.

In this paper the stock worth is prognosticated inside the arranged forecast model by exploitation the recorded data and text supposition mining in web-based media data. The creator has gathered the information from Yahoo account which contains the chronicled data of 3 months of arranged firms. Yet, this is utilized for month to month expectation. The creator has conjointly utilized The Economic Times data and data from Twitter which likewise contains the surveys (or) news that is communicated by each individual is assessed by the slant worth. This data is utilized for day by day expectation. The Sentiment Analysis[9],[17] is joined with the least difficult forecast rule.

### 3. PROBLEM STATEMENT:

To make every trade in profit is really a difficult and challenging task for traders or investors. When human tend to get overwhelmed by emotions that may lead us to taking risky trading decisions thus incurring huge losses. That is why algo trading is the best trade methodologies as it overcomes any decision taken under any psychological influence as well as it reduce human emotion involvement. In algo trading, algorithm concurrent autonomous market checks are made to execute deals at simplest

possible cost. The most significant power of algo trading is in the introduction of high-frequency trading (HFT). High-frequency trading manages to put a large number of bets at very high speed in several markets (BSE, NSE or commodity) based on multiple algorithmic decision parameters

### 4. PROPOSED METHODOLOGY:

The fundamental reason behind most recursive trading revolves around victimization package to identify profitable opportunities and mount up them quicker than somebody's may. The common indicators, techniques or methodologies used in algo trading are discussed below:

#### 4.1] PATTERN FOLLOWING TECHNIQUES:

The most widely recognized recursive trade techniques follow patterns in moving midpoints, value record developments, channel breakouts and associated specialized pointers. These zone unit most straightforward strategies to actualize through recursive business however these techniques don't include making any expectations or conjectures.

How it works:

- Exploitation 50DMA-and 200DMA - day moving midpoints might be a popular pattern following methodology. When 200 DMA (Daily Moving average) crosses 50 DMA line from downward to upward direction it generate BUY signal called as Golden buyin algo trading.
- But if 200DMA crosses 50 DMA line from upward to downward direction then it is SELL signal.



Figure 4.1 Trend following pattern

#### 4.2] ARBITRAGE METHODS:

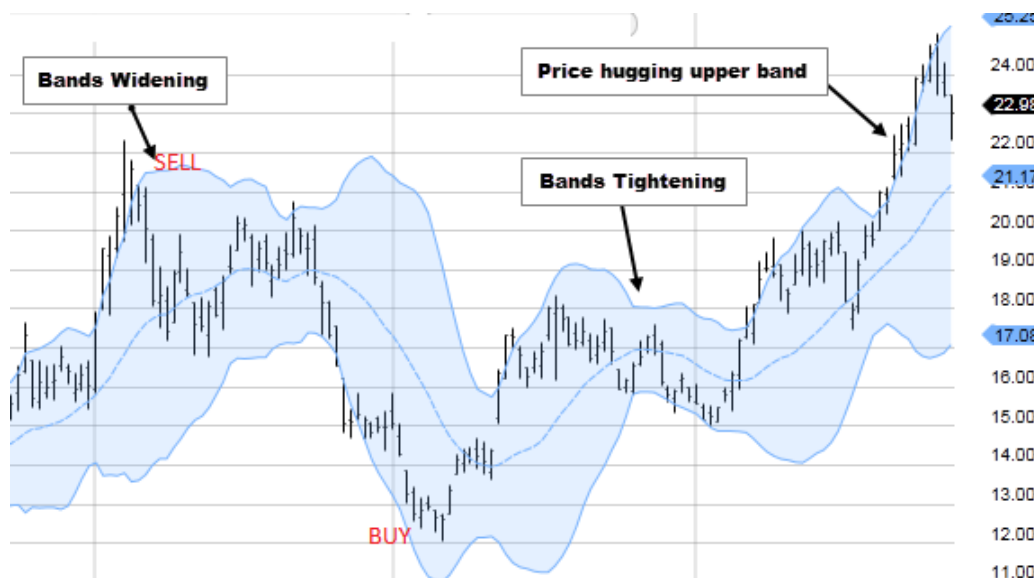
A double recorded stock purchasing at a (lower worth|lower cost|cheaper cost) in one market and at the same time corporate greed it at a superior cost in second market offers the value differential as unhazardous benefit on exchange. Steady activity

is regularly repeated for fates instruments versus stocks as worth differentials do exist now and again. Actualizing partner algorithmic guideline to spot such worth differentials and putting the requests proficiently give beneficial chances.

**4.3] BOLLINGER BAND INDICATOR STRATEGY:**

This is also one the best indicator strategy used in algo trading to make good profit. Bollinger Band

indicator contains two band i.e. Upper Bollinger Band and Lower Bollinger Band. Both bands are used to determine whether the price .of the stock is high or low on a relative basis.



How it works:

- Price of the stock are likely bounce within the envelope. One can use these swings to identify the profitable move.
- One can expect a strong trend when price moves out of the bands

$$P_{VWAP} = \sum_x P_x * Q_x / \sum_x Q_x$$

Where  $P_{VWAP}$ : Volume weighted Average price

$P_x$ : Price of stock x

$Q_x$ : Quantity of stock x

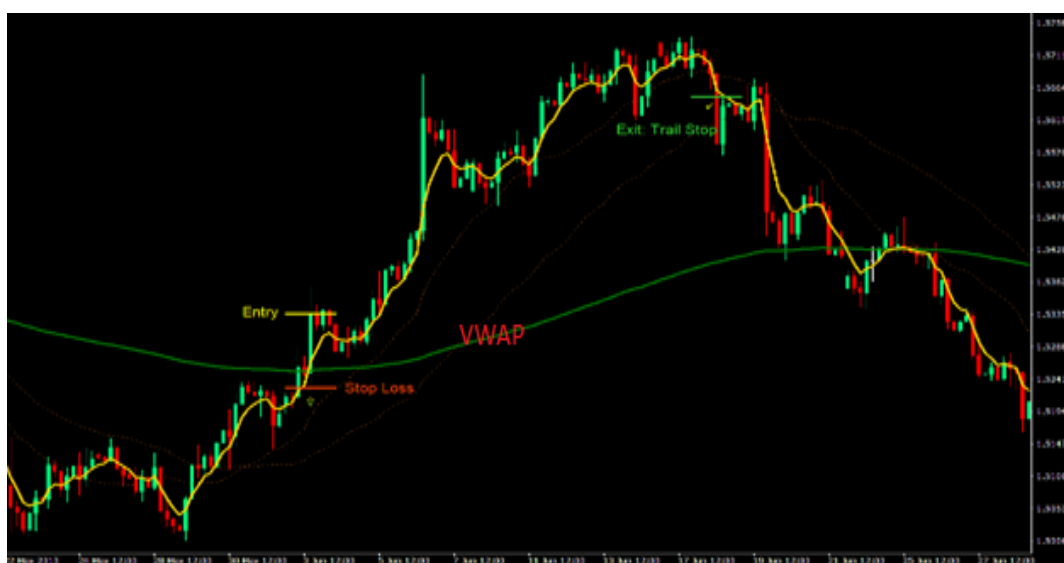
X: individual trade

**4.4] VOLUME WEIGHTED AVERAGE WORTH (VWAP):**

Volume weighted average price is the best indicator for short term trading purpose. The VWAP indicator gives average price based on volume and price. The mathematical calculation of VWAP is

How it work:

- If the price of particular stock is goes above the VWAP then it gives BUY (Entry) signal and to protect our money we can use trailing stop loss.
- When prices goes below the VWAP then it give SELL signal.



**Figure 4.5** VWAP Signal  
 Courtesy: speedtrader.com

5. PRACTICAL SET UP FOR ALGO TRADING:

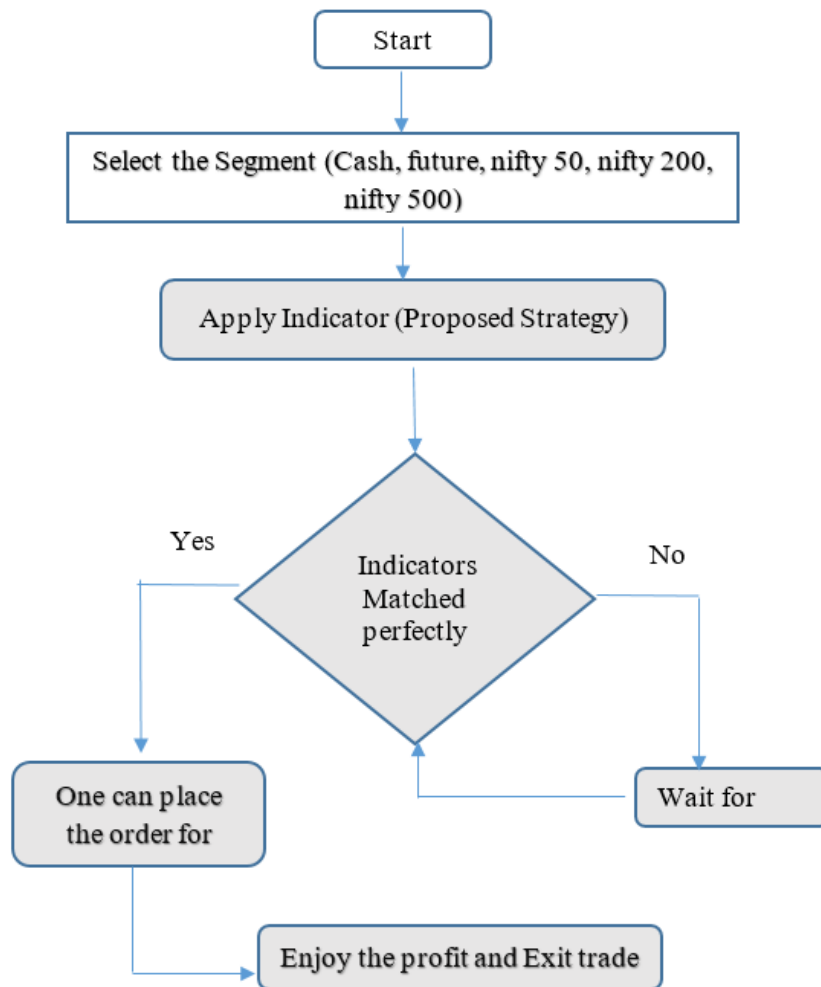
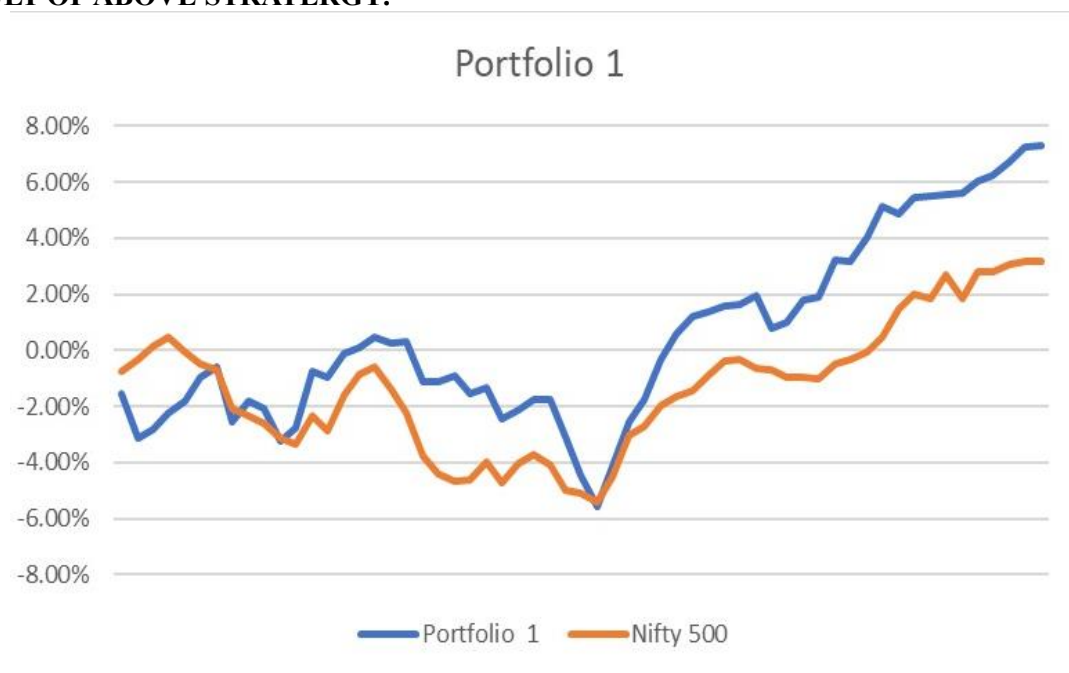
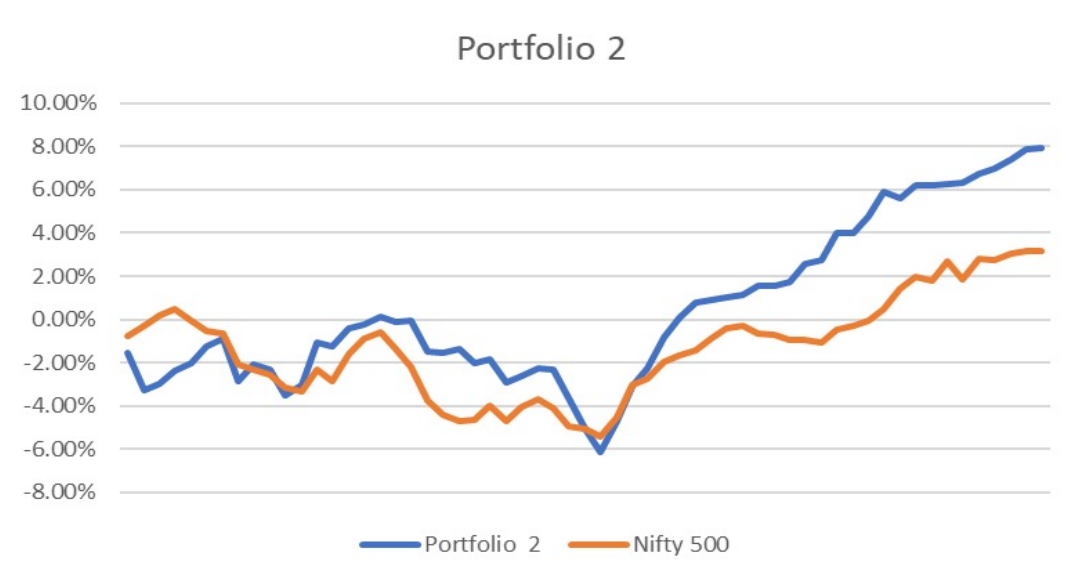


Fig. 5.1 Practical Algo set up on real data

6. RESULT OF ABOVE STRATEGY:





**Figure 6.1** Result of Algo trading strategy

In above diagram the portfolio 1 and portfolio 2 are the name of stocks which are identified by algo trading strategy and their profit price movement are plotted against the movement of Nifty500. It has been observed that the price moment of portfolio gives positive and desired moment in

### 7. FUTURE SCOPE:

Algorithmic trading is engaging quick market with traders and investors.[18] We are able to say it's a present of technological advancement to the exchange. Recently in Indian markets regulator SEBI has approved and strong the structure for algorithmic trading[19], creating its approval additional widespread and obscure.

By keeping a pace with apace dynamic times, it's become vital and essential tool for skilled traders and arbitrageurs to fix speed of execution victimization up to date technology tools. It makes algorithmic trading handy.

### 8. CONCLUSION:

Algo trading encourages brokers to execute arranges speedier, stretch methodology portfolios by exploitation extra progressed learning apparatuses and remove human feelings that generally affect the presentation of trading ways. The achievement pace of algo trading essentially relies upon the rationale used to plan the calculation or boundaries set inside the standard of algo. It is anything but a default framework; it's exclusively a stage any place people will execute their code according to their comprehension and in sync with a back-tried information base. Algo trading is additionally helpful for short traders, because it will increase liquidity within the market and it clarifies the entry and exit method.

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