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SURVEY ON STOCK MARKET ANALYSIS & PRICING MOVEMENT USING MACHINE LEARNING

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Abstract—Predicting the true stock price has been a long-standing subject for researchers in various fields. A model study based on arithmetic mean have been done to predict the movement of the stock price by using machine learning algorithm(MLA) such as SMA (Simple moving average) &EMA (Exponential moving average). The price fluctuation of the stock variesabnormally, as it depends on many factors such as Asian/European stock market, FII (Foreign Institutional Investors) &DII (Domestic Institutional Investors), value different commodities as well as day to day changesof functional strategy of different countries like -government Policies & sentiments, interest rate and inflation, Financial strategy of RBI and Governing of SEBI. As pandemic last longer and people converted their way of earnings in online mode and some of them forced to do trade to get rid of the hardship at financial journey. Generally, the people jump into the platform without trading knowledge and faces huge loss. Here the author takes pain to forecast the price a stock by using MLA algorithm over simple moving average. Study reveal that trading based on EMA generates more accuracy trading with SMA.

KEYWORD -Shares, BSE, National Stock Exchanges, Volatility, Nifty Prediction.

I. INTRODUCTION

Machine learning, by its definition, is a field of computer science that evolved from studying pattern recognition and computational learning theory in artificial intelligence. It is the learning and building of algorithms that can learn from and make predictions on data sets. These procedures operate by construction of a model from example inputs in order to make data-driven predictions or choices rather than following firm static program instructions.

Machine learning involves two types of tasks:

Supervised machine learning:

A model of Artificial Neural Network(ANN) that is learning with supervisor that analyses the training data and produces an inferred function, which can be used for mapping new examples.

• Unsupervised machine learning:

Similarly, ANN with unsupervised learning refers to the use of artificial intelligence (AI) algorithms to identify patterns in data sets containing data points that are neither classified nor labelled.

In this paper, we propose the use of global stock data in associate with data of other financial products as the input features to machine learning algorithms such as SMA & EMA. In particular, we are interested in the correlation between the closing prices of the markets that stop trading right before or at the beginning of US markets.

The Indian money market presently has been playing very key role for financing and providing loan to the different industries based on the process of financial liberalization, Privatization and Globalization. The major role of world stock market is providing a single platform for sell and buyer, supporting corporate industry, encourages entrepreneurship, mobilizing resources, allocation of resources with respect of countries economic growth. Being the developing country the financial policy in India facing one of the lowest rates of growth in their development as compare to the other nation in the world instead of high growth, high public saving and high degree of Self relization. India's growth rate averaged less than 5 % annum between 1950 and 1990.

Development ^[1]stage has taken room after 1991 in the capital market with pioneering strategies and policies. In 1991 the formation was made up of Securities Exchange Board of India (SEBI), to manage both the development of the country and regulation of the money market and independent powers has been set-up as a fully self-ruling body which is held accountable to look after the work of Indian Stock Markets.

In 1875 BSE (Bombay stock exchange) was recognised with the view to develop and restart finance industry. Stock market has been assigned an important place in financing the corporate sector and marking an important contribution to economic development of the country. It is a room where people buys and sells of securities can come into into transactions to purchase and sell shares of the company, debentures, bonds etc. Stock market is the place where the investor can earn by mobilizing their capital from equity / commodity market.

II. BRIEF OVERVIEW OF STOCK MARKET

Stock market in India is mainly based on Bombay Stock Exchange (BSE), the oldest exchange in India. It started its journey in 1855 by the collaboration of four Gujarati and one Parsi stockbroker under a banyan trees in front of Mumbai's Town Hall. There are multiple changes took place as the number of brokers increased successively The initial set up moved to Dalal Street in 1874 and it became an official organization by renaming 'The Native Share & Stock Brokers Association' in 1875. Thereafter from 1958, the BSE became the first stock exchange that was recognized by the Central Government under the Securities Contracts Regulation Act. The exchange again shifted to the Phiroze jeebhoy Towers at Dalal Street in 1980. BSE SENSEX index was developed by the team of BSE members to measure overall performance of the stock markets. There are twenty two others stock exchange like, Stock Exchange, Mumbai and Ahmadabad are formed in 20th Century. The process of development and almost unparalleled growth was noticed in our money market as compare with any country in the world. The growth of Indian security moved exponentially as we measured it in terms of capital raised in the market, based on numbers of stocks hold, market valuation, number of traded volumes and total turnover on each day, investor populations and pricing indices of different sector of stocks. With time the market reshuffled many times as and when the profiles of the investors, issuers and intermediaries have changed significantly. BSE witnessed fundamental changes like reduction in transaction costs that create noticeable improvements in efficiency, transparency and safety, thanks to the National Stock Exchange. Presently Indian market is capable to compete to any market of developed country in terms of a number of parameters.

Stock Market is a platform in which investors can stock buy and sell different stocks. The market decides the day's price for each and every stock listed under it through a process of bid. The investor can bid for buying a stock else he offers to sell the same in a particular price based on market price. Buyers tried with each other in competition to offer the best bid, i.e. the highest price as quoted to purchase a particular stock. In the same way, sellers struggle with each other for the lowest price quoted to sell the stock. When a match arises between the buyer and seller a trade is executed. The total process is automated and informed to exchanges with high-speed computers by the different group of tread brokers. From the last 14 decades, BSE has facilitated the growth of the Indian corporate sector by providing it an efficient capital-raising platform. Near about 5000 listed companies are traded on BSE and it is the No.-1 world's exchange in terms of listed members

III. SECURITIES EXCHANGE BOARD OF INDIA

The health of Countries economy can be viewed from its shear market. Basically it is financial stage of the country of present situation. For strengthen the economic condition of the country and to protect the rights of the investors it is very vital to keep monitoring the share market. For this reason the Capital Issue (Control) Act, 1947 was imposed but it was failed to control fully the market. Securities and Exchange Board of India (SEBI) was established in 1992 order to provide support to this act.

There are few listed function of SEBI are mentioned below:

The activity of SEBI can be divided under three major heads:

• Protective Functions:

- To protect unhealthy trade activities in the market.
- To verify all investor in securities market.
- To offer proper education relating to securities market to the investors.
- To provide learning of code of conduct pertaining to security market.

• Regulatory Functions:

- To control the business strategy of share market.
- To registers and regulate the venture capital funds.
- To perform time to time audit of the share markets.
- To register credit rating agency and to regulate the same.

• Developmental Functions:

- To provide efficient training to all the persons of intermediaries.
- To reinforce and encourage self regulating organizations.
- To provide access to carry out research for developing the work of shear market.
- To bring out different information's for the convenience of all operating in the capital markets.

IV. DEPOSITIORY PARTICIPANT

Depository Participant (DP) is describing in India as the agent (law) of the depository. This establishment is acting as intermediaries between the depository and the investors in the market. The functioning between the DP's and the depository is regulated by the mutual agreement between investor by an agreement made between the two parties under the act of depositories. DP is an entity who is working with SEBI under the Sub section of 1A of the SEBI Act 12.

Basis on this act, a DP can recommend depository-related services only after getting certificate of registration from SEBI. So far in 2012 accounting, there were total of 288 DPs of NSDL and 563 DPs of CDSL registered with SEBI.

Depository is an institution which holds securities certificates of investors, in which trading is done among shares, debentures, mutual funds, derivatives, F&O and commodities. The intermediaries are performing their activities on securities at Depository on behalf of their clients. These intermediaries are known as Depositories Participants. Fundamentally, there are two sorts of depositories in India.

As per record up to January 2021, 1.7 million new Demat accounts were added; the highest monthly increase in opening the account was recorded since September 2019 near about 1.9 million. Till to January 2021, the number of total Demat accounts stood at 51.5 million in India, which is compared with 40.8 million at the end of FY20 and 35.9 million in FY19.

INDIAN STOCK MARKET AND IT'S ACTUAL TRADING TIMINGS.

	Pre-opening session		
	Session I	Session II	Session III
	9:00AM –	9:08AM –	9:12AM –
	9:08AM	9:12AM	9:15AM
EQ	Post-closing session		
	Session I	Session II	
	3:30рМ –	3:40AM - 4:00AM	
	3:40AM		
	Normal trading session 9:15AM - 3:30PM		

Pre-opening session-

The pre-opening session starts at 09:00 AM and extends up to 09:15 AM. It's further divided into three sections. During one of these sections, you can place orders to buy or sell shares for a limited period. Let's look at the details of the pre-opening session below.

Session I - 9:00AM - 9:08AM

During these 8 minutes, you can place orders to buy or sell different shares in the stock market. In addition to that, you can also modify or cancel any orders that you may have placed. When the normal trading session begins at 09:15 AM, the orders placed during this section of the pre-opening session get preference in the queue of orders.

Session II - 9:08AM - 9:12AM

During these 4 minutes, you cannot place any new orders, modify existing ones, or cancel any order. This section is necessary so that price matching can be performed. Price matching involves comparing demand and supply. It helps determine the final prices at which different shares will be traded when the market opens at 09:15 AM.

Session II - 9:12AM - 9:15AM

This 3-minute window of time is like a connection section between the pre-opening session and the normal trading hours. It behaves like a buffer to ease the transition into the regular trading session. Again, during these 3 minutes as well, you cannot place, modify, or cancel any orders.

Normal trading session-

This is also known as the continuous trading session, and it runs from 09:15 AM to 03:30 PM. During this session, you can trade freely, place orders to buy or sell stocks, and modify or cancel your buy or sell orders without any limitations. During this window of the share market timings, a bilateral order matching system is followed. This means that each sell order is matched with a buy order that has been placed at the same stock price, and each buy order is matched with a sell order that has been placed at the same stock price.

Post-closing session-

This session begins when the regular trading session comes to a close at 03:30 PM. The post-closing session, which runs up to 04:00 PM, consists of two sections.

Session I - 3:30PM - 3:40PM

In these 10 minutes, the closing prices of stocks are calculated by taking the weighted average of the stock prices traded between 03:00 PM and 03:30 PM. The closing prices of indices like Sensex and Nifty are calculated by considering the weighted average prices of all the securities that are listed in that index.

Session I - 3:40PM - 4:00PM

In this 20-minute section, you can still place buy and sell orders. But the orders are confirmed only if there are sufficient numbers of buyers and sellers in the market.

VI. FACTORS THAT AFFECTS THE INDIAN STOCK MARKET

The fluctuation of stock and commodities prices makes equity investments risky. Generally, risk-averse investors usually prefer to stay away from the market. On the other side, the risk-takers invest aggressively take the benefit of fluctuation of stock price to create wealth in the long-run. The very active character of share market makes it an intriguing prospect to venture into. No one perfectly predict the future movement of the stock market. There are factors that mostly affect the price of the Indian stock market that are discussed in detail.

- Government Policies & sentiments
- Monetary Policy of RBI and Regulatory Policies of SEBI
- Exchange Rates:
- Interest Rate and Inflation
- Foreign Institutional Investors (FIIs) and Domestic Institutional Investors (DIIs):
- Politics
- Natural Disasters
- Economic Numbers
- Gold Prices and Bonds

VII. ALGORITHMS

Moving Average-

Moving averages are one of the most used tools in stock trading. In simple word, a moving average is an indicator that shows the average value of a stock's price over a period (i.e. 10 days, 50 days, 200 days, etc.) and is usually plotted along with the closing price.

The most common applications of moving averages are to identify the trending direction and determine support and resistance levels. One can also say that moving averages are used to smoothen out the 'noise' of short-term price fluctuations, so as to be able identify and define significant trends underlying more readily. to Some traders use the moving averages to not only identify index/stock trends but also to determine entry and exit strategies. Crossovers are one of the main moving average strategies. Moving average crossovers are a popular strategy for both entries and exits, while another strategy is to apply two moving averages: one long term and one short term to figure out a trend. When the shorter-term MA crosses above the longer-term MA, it gives a 'buy' signal, as it indicates that the trend is shifting. There are five popular types of moving averages (simple, exponential, triangular, variable and weighted moving averages). However, the only significant difference between these different types of moving averages is the weight assigned to the most recent data.

A. Simple Moving Average-

SMA or Simple Moving Average is a straightforward calculation of a stock's average price (usually using close price) over a set number of days.

In this article, I will be using SMA, because it's beginner friendly. Also Charles Schwab said that SMA is great for detecting daily pattern, the consequence is that SMA is not really good in detecting hourly pattern. In this article we will use 5 years' data.

Generally speaking, the most used SMA periods in trading are: 20 days for swing trading 50 days for medium-term trading 200 days for long-term trading

The Formula for SMA is:

 $A1 + A2 + A3 \dots + An$ SMA =

where:

An=the price of an asset at period n

n=the number of total periods



Fig. No. 01 (Describing recent trends on equity FSL from 05-Sep-19 to 03-Sep-21)

For example, this is how you would calculate the simple moving average of a F.S.L Stock with the following closing prices over a 24-monthsperiod (05-Sep-19to03-Sep-21). Three different lines in fig. 01 describing moving average of stock value for 20, 50 & 200 days respectively.

Yellow colour chart is indicating 200 day SMA, Gray line indicating 50 days SMA & blue lines showing the 20 days SMA respectively.

All the three plots maintaining straight line up to 5thJuly 2020 there after they shoot up & follow up trends till to the July2021.

Data has been collected from the following site below (nseindia.com) https://www1.nseindia.com/products/content/equities/equities/eq_security.htm

An MA with a short time frame will react much quicker to price changes than an MA with a long look back period. In the fig-01 above, the 20-day moving average more closely tracks the actual price than the 200-day moving average does.

The 20-day may be of analytical benefit to a shorter-term trader since it follows the price more closely and therefore produces less "lag" than the longer-term moving average. A 50-day MA may be more beneficial to a medium-term trader. A 200-day MA may be more beneficial to a longer-term trader.

As the name suggests, a golden cross shows bullish conditions. When the SMA (50) crosses above the SMA (200), the market becomes bullish, and traders will look to buy into support.

A death cross appears when the SMA (50) moves below the SMA (200). The price shows bearish conditions and will meet resistance every time it spikes into the SMA (50) or SMA (200).

Trading with golden and death crosses is one of the most straightforward technical analysis concepts. The beauty part of it is that it works on all timeframes and on all currency pairs.

Implementing in Python

We start by plotting our desired stock over a 24 months' period.

import pandas as pd Import mat plot lib.py plot as plt df = pd.read_csv("C:\\ Users\\ASHU\Desktop\\nsedata.csv") df.plot(y='CP', x='Date', color='black', linewidth=1) plt.ylabel("Closing Price") plt.grid(True) plt.title("Price movement of FSL stock")



Price movement of FSL stock

(Describing closing price movement from 05-Sep-2019 to Sep 2021)

The above plot(fig.-02) of the price of a stock clearly indicates price remain almost constant from 05 Sep 2019 to Feb 2020, thereafter price of the stock ,moves slide wisely again its shoots up to Rs.240 within the periods 30 Jun 2020 - July 31. The increase up the price shoots up to 500% with the period of one year & the entire shareholder enjoyed with hike price of the stock. But if we look to the end of the stock price again it fall down from the highest price.

SMA-20

import pandas as pd import matplotlib.pyplot as plt $df = pd.read csv("C:\\Users\\ASHU\Desktop\\nsedata.csv")$ df.plot(x='Date') plt.plot(df['CP'], label='Closing Price', color=blue, linewidth=1) plt.plot(df['SMA-20'], color=yellow, linewidth=1) plt.ylabel("Closing Price") plt.xlabel("Date") plt.grid(True) plt.title("SMA-20 (Simple Moving Average), FSL Stock") SMA-20 (Simple Moving Average), FSL Stock CP SMA-20 200 Closing Price 150 100 50 18-Nov-20 16-Apr-21 05-Sep-19 31-Jan-20 30-Jun-20 Date Fig. No. -03 (Describing closing price movement with SMA-20 from 05-Sep-2019 to Sep 2021)

The above graph clearly demonstrate that the SMA-20 of the stock price remain almost constant from 05-Sep-2019 to Feb 2020, thereafter price of the stock moves side wise again its shoots up to 240Rs./- within the periods 30 Jun 2020 – July 31. The price of SMA-20shoots up to 581% within the period of one year & the entire swing trader (those who are purchasing stock for a short period) enjoyed with hike price of the SMA-20. But it is also observed the price of SMA-20 again corrected at the end of the plot.

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SMA-50

import pandas as pd import matplotlib.pyplot as plt df = pd.read_csv("C:\\Users\\ASHU\Desktop\\nsedata-50.csv") df.plot(x='Date') plt.plot(df['CP'], label='Closing Price', color='blue', linewidth=1) plt.plot(df['SMA-50'], color='yellow', linewidth=1) plt.ylabel("Closing Price") plt.xlabel("Date") plt.grid(True) plt.title("SMA-50 (Simple Moving Average), FSL Stock")



The above graph clearly demonstrate that the SMA-50 of the stock price remain almost constant from 05-Sep-2019 to Feb 2020, thereafter price of the stock moves side wise again its shoots up to 190Rs./- within the periods 30 Jun 2020 – July 31. The price of SMA-50 shoots up to 442% within the period of one year & the entire swing trader (those who are purchasing stock for a short period) enjoyed with hike price of the SMA-50. But it is also observed the price of SMA-50 again corrected at the end of the plot.

SMA-200

import pandas as pd import matplotlib.pyplot as plt $df = pd.read_csv("C:||Users||ASHU|Desktop||nsedata-50.csv")$ df.plot(x='Date') plt.plot(df['CP'], label='Closing Price', color='blue', linewidth=1) plt.plot(df['SMA-200'], color='yellow', linewidth=1) plt.ylabel("Closing Price") plt.xlabel("Date") plt.grid(True) plt.title("SMA-200 (Simple Moving Average), FSL Stock")



Fig. No. -05 (Describing closing price movement with SMA-200 from 05-Sep-2019 to Sep 2021)

Best on the study of 3 different plots of SMA such as SMA-20, SMA-50 & SMA-200 it is observed that gradual higher days of SMA remove fluctuation of the price of the stock & generate smooth curve for the price of stock. The price of SMA-200 shoots up to 273% within the period of one year & the entire long term trader (those who are purchasing stock for a long period) enjoyed with hike price of the SMA-200.

COMPARE BETWEEN SMA-20, 50& 200

import pandas as pd import matplotlib.pyplot as plt df = pd.read_csv("C:\\Users\\ASHU\Desktop\\nsedata.csv") df.plot(x='Date') plt.plot(df['CP'], label='Closing Price', color='blue', linewidth=1) plt.plot(df['SMA-20'], label='SMA-20', color='yellow') plt.plot(df['SMA-50'], label='SMA-50', color='green') plt.plot(df['SMA-200'], label='SMA-200', color='red') plt.slabel("Date") plt.ylabel("Closing Price") plt.title("SMA-20, 50 & 200 (Simple Moving Average), FSL Stock") plt.grid(True)



In the above chart (fig.06) all three lines SMA-20, SMA-50& SMA-200 is following almost similar trends but SMA-200 differs from the other because, the long period mean of the price of the stock that generally distributed over large range of price. It is also confirming that gradual higher days SMA always be placed at the lower point. It is also viewed as trader that gradual more days of SMA giving more accuracy at the trading price.

B. Exponential Moving Average-

An exponential moving average (EMA) is a type of moving average (MA) that places a greater weight and significance on the most recent data points. The exponential moving average is also referred to as the exponentially weighted moving average. An exponentially weighted moving average reacts more significantly to recent price changes than a simple moving average (SMA), which applies an equal weight to all observations in the period.

- The EMA is a moving average that places a greater weight and significance on the most recent data points.
- Like all moving averages, this technical indicator is used to produce buy and sell signals based on crossovers and divergences from the historical average.
- Traders often use several different EMA lengths, such as 10-day, 50-day, and 200-day moving averages.

The Formula for EMA is:

$$\mathsf{EMA}(today) = \left(\left(\mathsf{PRICE}(\mathsf{today}) * \left(\frac{Smothing}{1 + \mathsf{Days}}\right)\right) + \mathsf{EMA}(yesturday) * \left(1 - \frac{Smoting}{1 + \mathsf{Days}}\right)\right)$$

where:

EMA=Exponential Moving Average

While there are many possible choices for the smoothing factor, the most common choice is:

• Smoothing = 2

That gives the most recent observation more weight. If the smoothing factor is increased, more recent observations have more influence on the EMA.

CALCULATING THE EMA

Calculating the EMA requires one more observation than the SMA. Suppose that you want to use 20 days as the number of observations for the EMA. Then, you must wait until the 20th day to obtain the SMA. On the 21st day, you can then use the SMA from the previous day as the first EMA for yesterday.

You must calculate the multiplier for smoothing (weighting) the EMA, which typically follows the formula:

 $[2 \div (number of observations + 1)]$

For a 20-day moving average, the multiplier would be [2/(20+1)] = 0.0952.

Finally, the following formula is used to calculate the current EMA:

• EMA = Closing price x multiplier + EMA (previous day) x (1-multiplier)

The EMA gives a higher weight to recent prices, while the SMA assigns equal weight to all values. The weighting given to the most recent price is greater for a shorter-period EMA than for a longer-period EMA. For example, an 18.18% multiplier is applied to the most recent price data for a 10-period EMA, while the weight is only 9.52% for a 20-period EMA.

SMA-20 & EMA-20

import pandas as pd import matplotlib.pyplot as plt df = pd.read_csv("C:\\Users\\ASHU\Desktop\\nsedata20.csv") df.plot(x='Date') plt.plot(df['CP'], label='Closing Price', color='blue', linewidth=1) plt.plot(df['SMA-20'], label='SMA-20', color='yellow', linewidth=1) plt.plot(df['EMA-20'], label='EMA-50', color='green', linewidth=1) plt.xlabel("Date") plt.ylabel("Closing Price") plt.title("SMA-20 & EMA-20 (Moving Average), FSL Stock") plt.grid(True)





Here you can see (fig.07) that in the graphic above that there appears to be little difference between the two SMA-20 & EMA-20. Normally, the EMA will change sooner than the SMA because it emphasizes the more recent activity more than the older activity.

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SMA-50 & EMA-50

import pandas as pd import matplotlib.pyplot as plt df = pd.read_csv("C:\\Users\\ASHU\Desktop\\nsedata50.csv") df.plot(x='Date') plt.plot(df['CP'], label='Closing Price',color='blue', linewidth=1) plt.plot(df['SMA-50'], label='SMA-50', color='yellow', linewidth=1) plt.plot(df['EMA-50'], label='EMA-50', color='green', linewidth=1) plt.xlabel("Date") plt.xlabel("Closing Price") plt.title("SMA-50 & EMA-50 (Moving Average), FSL Stock") plt.grid(True)



Shorter-term traders might find the EMA more effective in implementing their trading strategies since it is more sensitive to the recent price movement. EMA is much closer to the trend than SMA. When EMA crossover SMA line upside it indicating bullish, when the same crosses down side it forecast bearish single in the trade.

We^[8] can utilize moving averages always for both trading and analysis of all signals. If the price will be above the moving average, which indicates that price could be ready for trading above average during the period which already analyzed. This will be the confirmation for uptrend. When its price stays below of the moving average, which indicates that price will be trading below average for the period of analysis. This indicates the confirmation of downtrend.

SMA-200 & EMA-200

import pandas as pd import matplotlib.pyplot as plt df = pd.read_csv("C:\\Users\\ASHU\Desktop\\nsedata200.csv") df.plot(x='Date') plt.plot(df['CP'], label='Closing Price',color='blue', linewidth=1) plt.plot(df['SMA-200'], label='SMA-200', color='yellow', linewidth=1) plt.plot(df['EMA-200'], label='EMA-200', color='green', linewidth=1) plt.slabel("Date") plt.slabel("Closing Price") plt.title("SMA-200 & EMA-200 (Moving Average), FSL Stock") plt.grid(True)



for a period of 05 Sep 19 - Aug 2021)

The above graph clearly demonstrates that the SMA-200 of the stock price shoots up to Rs.135 from 30-Jun-2020 to Sep 2021. The price of SMA-200 shoots up to 211% within the period of one year & the entire long-term trader (those who are purchasing stock for a long period) enjoyed with hike price of the SMA-200. While it is also observed the price of EMA-200 shoots up to 425% within the period of one year (Rs.170 shoots up from 30-Jun-2020 to Aug 2021).

MOVING AVERAGECROSSOVER-

Below is an example of combining the longer-term trend defining SMA (60 Days) with a shorter-term EMA (20 Days) to spot potential changes in trend& making a worthy earnings.



Fig. No. -10 (Moving average crossover)

In the chart above, there are two moving averages:

Black Line: 60 periods SMA (As support/resistance)

Blue Line: 20 periods EMA (As buy/sell signal)

This ^[9] strategy is called a Moving Average Crossover. The SMA is used to identify the longer-term trend and potential areas of support or resistance, while the shorter-term EMA, also called the signal line, will be used to identify potential changes in the trend for buying or selling opportunities.

Starting in the upper left and following along with the numbers above:

Point 1: We see the more sensitive EMA cross above the longer-term SMA signalling a potential change from a downtrend to an uptrend. This would be a place where a trader may look to execute a buy order to establish a long position and making a good profit.

Points 2 and 3: As the market ups, we look to the longer-term SMA as an indication of potential support from prices climbing higher and the uptrend continuing. As you can see there were multiple times where price down, touched the 60 period SMA, but could not break through.

Point 4: Price finally breaks through and the next candles close below the SMA. Shortly after, the EMA crosses below the SMA signalling a potential change from an uptrend to adown trend. In this area, traders would exit their buy positions and may choose to reverse with a sell order to establish a short position.

Point 5:As the market downs, we look to the longer-term SMA as an indication of potential resistance from prices climbing higher and the downtrend continuing. As you can see there were multiple times where price rose up, touched the 60 period SMA, but could not break through.

Point 6: Again we see the more sensitive EMA cross above the longer-term SMA signalling a potential change from a downtrend to an uptrend. This would be a place where a trader again may look to execute a buy order to establish a long position.

Point 7: Again EMA crosses below the SMA signalling a potential change from an uptrend to a downtrend. In this area, again traders would exit their buy positions and may choose to reverse with a sell order to establish a short position and making a good profit.

CONCLUSIONS

In this paper, the author wants to explain through a simple algorithm to find the best SMA & EMA for stock and ETF (Equity traded funds) trading. It can be easily applied every trading day in order to find out the trading where the trade can be buy/sell. In this way, a trader can easily adapt to market changes and the volatility fluctuations of the market.

At the view point of the traders it is concluded that EMA of any stock is provide much more accuracy than normal SMA of the same stock and it is also saying when EMA crossover SMA line upside it indicating bullish, when the same crosses down side it forecast bearish single in the trade.

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