

Analysis of the Technical Trading Rules

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ABSTRACT

The debate over technical trading strategies has centered around the question of whether an actively managed portfolio, controlled by a technical indicator, can outperform a passively managed portfolio. Technical trading strategies help the investors to invest in the securities by studying the past trend of the stocks. The trends are based on the past performance of the stocks. The new investors who want to invest in the securities can make use of the technical trading strategies to get to know about the buy and sell signals. This study focuses on the technical trading strategies Simple moving average, Adaptive moving average, Bollinger's band and Commodity channel index to identify the buy and sell signals for Nifty 50. These strategies help the investors to build a profitable portfolio. The trading tools have indicated consistent results. Hence by this study it can be concluded that the investors can use Simple moving average, Adaptive moving average and Bollinger's band often to identify the buy and sell in any of the stocks of Nifty 50. Among all the strategies commodity channel index is not correlated with other strategies hence the investors can rely on other strategies.

Keywords: Adaptive moving average, Bollinger's band and Commodity channel index

Introduction

The ultimate goal of any investment strategy is to maximise returns with the minimum risk. In the framework of modern portfolio theory, it is achieved. The construction of such an optimal portfolio clearly requires a priori estimates of assets risk and returns by constructing a portfolio investment, which is weighted in a way seeks to achieve the required balance of maximum return and minimum risk. The principles of technical analysis are derived from hundreds of years of financial market data. In Asia, technical analysis is said to be a method developed by Homma Munehisa during the early 18th century which evolved into the use of candlestick techniques, and is today a technical analysis charting tool. In the 1920s and 1930s Richard W. Schabacker published several books which continued the work of Charles Dow and William Peter Hamilton in their books Stock Market Theory and Practice and Technical Market Analysis. In 1948 Robert D. Edwards and John Magee published Technical Analysis of Stock Trends which is widely considered to be one of the seminal works of the discipline. It is exclusively concerned with trend analysis and chart patterns and remains in use to the present. The methods that are used to analyse securities and make investment decisions fall in two broad categories: Fundamental analysis and technical analysis. Technical analysis looks at the price movement of a security and uses this data to predict its future price movements. Fundamental analysis, on the other hand, looks at economic factors, known as fundamentals. At the most basic level, a technical analyst approaches a security from the charts, while a fundamental analyst starts with the financial statements and focuses on intrinsic value. Technical traders, on the other hand, believe there is no reason to

analyze a company's fundamentals because these are all accounted for in the stock's price. Technicians believe that all the information they need about a stock can be found in its charts.

The key differences between technical analysis and fundamental analysis are as follows:

- ❖ Technical analysis mainly seeks to predict short-term price movements, whereas fundamental analysis tries to establish long-term values.
- ❖ The focus of technical analysis is mainly on internal market data, particularly prices and volume data. The focus of fundamental analysis is on fundamental factors relating to the economy, the industry, and the firm.
- ❖ Technical analysis appeals mostly to short-term traders, whereas fundamental analysis primarily to long-term investors.

Technical analysis is done by analysis the charts. Let us look at different charting techniques that are there which can be used for the analysis.

Charting techniques

Technical analysis uses a variety of charting techniques. The most popular ones seem to be the Dow Theory, bar and line charts, the point and figure charts, the moving average line and the relative strength line.

The basic concepts underlying chart analysis are:

- 1) Persistence of trends – the key belief of the chartists is that stock prices tend to move in fairly persistent trends. Stock price behavior is characterized by inertia: the price movement continues along a certain path (up, down or sideways) until it meets an opposing force, arising out of an altered supply-demand relationship.
- 2) Relationship between volume and trend – chartists believe that generally volume and trend go hand in hand. When a major upturn begins, the volume of trading increases as the price advances and decreases as the price declines. In major downturn, turn volume of trading increases as the prices declines and decreases as the prices raises.
- 3) Resistance and support levels – chartists assume that it is difficult for the price of a share to rise above a certain level called the resistance level and fall below a certain level called a support level.

The Dow Theory – Originally proposed in late nineteenth century by Charles H. Dow, the editor of The Wall Street Journal, the Dow Theory is perhaps the oldest and best known theory of technical analysis. According to Charles Dow: “The market is always considered as having three movements, all going at the same time. The first is the narrow movement from day to day. The second is the short swing, running from two weeks to a month or more and the third is the main movement, covering at least four years in the duration”. **Bar and line charts** are most commonly used indicators of price movements. **Point and figure chart (PFC)** considers only the significant price changes. Each column on the horizontal scale of a PFC represents a significant reversal of price movement and not a trading day. By eliminating the time scale and small changes, the PFC condenses the recording of price changes. This helps in identifying patterns and changes more easily. **Moving average analysis** identifies trends, technical analysts use multiple moving averages analysis: to reflect on price trend. **Relative strength analysis** is based on the assumption that prices of some securities rise rapidly during the bull phase but fall slowly during the bear phase in relation to the market as a whole. That is, such securities possess greater relative strength and hence outperform the market.

These charting techniques helps to identify the trends of the stocks early are helpful aids in investment decision making. Charts provide a picture of what has happened in the past and hence give a sense of volatility that can be expected from the stock.

The following section focuses on some of the evidences from the previous research that were conducted on different technical analysis tools and their findings and gaps.

2. LITERATURE REVIEW

The literature review focuses on the history of the different trading strategies that were used to predict the future prices of the stocks in different indexes across different markets. Technical analysis chart patterns are introduced, which are based upon historical stock price movement used by traders to make trading decisions. These chart patterns are shown with additional trading strategies that encompass money management rules to protect assets. The following reviews give an idea about different trading strategies for the speculation of the stock prices. Robert M Kirby (1966) did a study to evaluate a statistical forecasting methods to explain how these methods explain wealth of information. The study described the popular methods using Exponential smoothing, Moving average, Least square found that exponential smoothing and moving average methods were equal in overall performance for the intermediate range. But for short range forecasts, exponential smoothing was superior A similar study was carried out by Subrata Kumar Mitra (2002), he studied the profitability of the trading strategies by using moving average and filter rules and found that the two trading methods tested in the study are giving profitable results helps to believe that making profit in stock market is not a matter of chance. Sarla, Anubhai, Rajal(2005) focused on the applicability of the trading rules in Indian stock market and aimed to analyse the effect of transaction costs on prospective returns on individual returns. The data selected were daily closing value data of BSE Sensex from 1st Feb 1991 to 5th March 2003 and was analysed using variable length moving average and found that Variable moving average trading rule have predictive ability and also the ability to beat the market for those moving averages, which sufficiently closely follow the trend in the market cycle.Parvez Ahmed, et. al (2005) conducted a research to apply technical trading rules to currencies of emerging economies using Currency spot rates from different emerging markets like Mexico, Chile, Thailand, Indonesia, South Korea and found out that emerging currencies typically have significant autocorrelation along with low liquidity. Gil Cohen, et.al. (2011) focused to find the difference between the professional and amateur investor's approach towards technical and fundamental analysis and their buying and selling decisions by using Descriptive statistics. The data was collected using a questionnaire through a survey (14 questions measured by Likert 5 point scale) from 305 respondents and the result indicates a relatively long investment horizon suitable to fundamental analysis relatively to short-run investment preferences technical analysis is preferred. A study by Liaw Siqin (2012) aimed to provide more insight on the usefulness of technical analysis in an emerging market currency with frequent central bank intervention using the moving average and this study showed that trend following strategies like the moving average rule and the channel rule produce unremarkable results at best. Kevin K. Robinson (2013) conducted study a with the purpose to discover the discrepancy in results of predictability from various types of technical analysis tools for recent stock market data by using five types of qualitative research designs which are (a) case study, (b) ethnography, (c) phenomenological study, (d) grounded theory study, (e) content analysis while quantitative research designs include (a) observation studies, (b) correlational research, (c) developmental designs, (d) and survey research and the findings of the study revealed that consistent positive returns are not possible utilizing the simple technical analysis moving averages. Each one of the 26 moving average tests produced negative returns over the time period 1987-2009. The t test for each confirmed the significance of these findings at the 0.05% level.

Naveen Kumar, et.al (2013) examined the importance that brokers' in providing fundamental and technical analysis over seven forecasting horizons and to examine the different factors affecting stocks by using primary and secondary data. They found that fundamental analysis should be used mainly for long term stock price prediction. This was consistent with earlier findings. Mohsen Ghobadi, Mitra Torabi (2015) explores multiple criteria such as overall trend, Buying/Selling Pressure, Reward to risk ratio of a new position and Potential entry levels for new long position. Considering them the study analysed which of them lead to high profitability. The profitability is evaluated by fuzzy multi-criteria decision-making (FMCDM). It was concluded that the 'Buying/Selling Pressure' was the most significant factor to influence the performance of a technical analyst. Mohsen Ghobadi, Maryam Ghobadi (2015) studied to test the reliability various indicators, considering the Relative Strength Index, Stochastic Oscillator, Simple Moving Average, Money Flow Index, Commodity Channel Index. They focused on optimal trading ability which can lead to high financial performance by using t-test and TOPSIS analysis on 10 listed Dow Johns companies and found that the results provided strong support for the technical indicators. In a recent study by Roy L Hayes, et.al (2016) aimed to determine if one technical trading strategy outperforms another under different stock conditions by using the daily closing price and trade volume of 296 stocks from 1997 to 2012. Moving Average, Adaptive Moving Average, Bollinger Bands, KDJ, Commodity Channel Index they found that technical trading strategies can be consistently profitable. The above review helps to find the research gap with which further study can be done by using more efficient technical trading strategies to predict the stock prices. Considering the above the proposed study focuses on finding an optimum technical trading rule which will help the investors to get better buy and sell signal.

The next chapter focuses on the research and design methodology which is used in this study which explains about the dataset and the analysis tools used in the study.

3. RESEARCH DESIGN AND METHODOLOGY

This section includes scope of the study, objective of the study, period of the study, data sources and data analysis plan is been explained. This study helps new investors who are interested in investing in the securities to identify right signal for buying and selling the stocks. Helps the investors to find right time to invest in the securities. Objective of the study are set as below:

1. To compare different trading strategies
2. To determine trading strategies which are used to decide on the buying and selling of the stocks.
3. To estimate the volatility of the Nifty 50 stocks.

The data considered for this research is the monthly closing prices and traded volume of the stocks in Nifty 50. The data is collected from the secondary source i.e. NSE website. The period considered for this study is from 2011 to 2015 that is the 5 years of trading period. The period is considered as 5 years because it helps to find a strong trend in the stocks.

Data analysis plan

The monthly closing price and the traded volume of 50 stocks from 2011 to 2015 is the dataset for experiments with the trading rules. These stocks are that which are continuously listed in Nifty 50. The Nifty 50 is a well diversified 51 stock index accounting for 13 sectors of the economy. It is used for variety of purposes such as benchmarking fund portfolios, index based derivatives and index funds. The Nifty 50 index represents about 65% of the free float market capitalization of the stocks listed in NSE as on March 31, 2016.

To analyse these stocks few technical trading strategies are used like moving average, adaptive moving average, Bollinger bands and commodity channel index. These strategies were chosen because they are among the most popular methods in technical trading. To make it simple to understand, the stocks are segmented into high and low volume and volatility and months are segmented into high and low volume and volatility. The technical trading rules used in this study are explained below.

3.2 TECHNICAL TRADING STRATEGIES

This section describes the trading rules used

1. Moving Average,
2. Adaptive Moving Average,
3. Bollinger Bands,
4. Commodity Channel Index.

These strategies are considered as they are the most popular technical trading strategies.

Moving Average

Moving average is one of the first technical trading rules taught to investors. Cootner (1962) was one of the first to demonstrate that a moving average could generate profit. However, Van Horne and Parker (1967) and James (1968) examined the same trading rule and found that it does not generate excess returns. The variations tested using the simple moving average rule here come from Brock et al. (1992). The basic structure of the two moving average rules is defined as Trading Rule 1.

Trading Rule 1 Moving Average

1. Sell (buy) when short period (2 month) average crosses from above (below) the long period (3 month) by more than 1 %.
2. Close any open position if the short period (2 month) crosses the long period (3 month) moving average.

Adaptive moving average

Adaptive Moving Average (AMA) was first proposed by Kaufman (1995). AMA is a modification of simple moving average and exponential moving average. The assertion is that stocks moving quickly in one direction are best represented by short term moving averages while stocks without a strong trend are better represented through longer period moving averages (Ellis and Parbery 2005). AMA implements an efficiency ratio (ER), which represents trend strength in the stock. As the price series from $P_{t-10} - P_t$ approaches a straight line, ER approaches 1. As the stock becomes more volatile, with no strong trend ER becomes 0 (i.e. oscillating stock). Kaufman incorporates ER into the moving average strategy to automatically adapt it to changing stocks, thereby allowing AMA take advantage of strong trends, while avoiding over-trading in rapidly oscillating assets. There are several steps to calculating AMA. The first step is to calculate the simple moving average. AMA must have a starting condition, which is generally an N period simple moving average. The next step is to calculate the efficiency ratio, which requires the following steps:

1. $Direction_t = |P_t - p_{t-N}|$
2. $Volatility_t = \sum_{i=0}^{N-1} |P_{t-1} - P_{t-i-1}|$

$$3. ER_t = \frac{Direction_t}{Volatility_t}$$

Direction determines how big a price move the underlying trend has generated. Volatility is the sum of the absolute value of daily price changes. ER measures how strong the underlying trend is relative to the magnitude of daily price changes. If all daily price changes move in the same direction, than ER will equal 1. However, as the price series becomes noisier or the direction value becomes smaller, ER approaches 0. The stability of ER is partially dependent on the number of periods examined (N). As N approaches 1, ER becomes more erratic. Kaufman suggests making $N = 10$. AMA modifies exponential moving average by dynamically changing the scaled smoothing coefficient (C). The smoothing coefficient determines how much weight is placed on previous observations. As ER approaches 1, less and less weight is placed on past observations. The following steps are used to calculate C :

1. fastest = $2/k_f + 1$
2. slowest = $2/k_s + 1$
3. $C_t = [ER_t (\text{fastest} - \text{slowest}) + \text{slowest}]^2$.

The fastest and slowest terms refer to a short period and long period moving average. The variables k_f and k_s are given in days. Kaufman suggests that the values should be 2 and 30 respectively, which is analogous to a 2 and 30 day moving average. The final equation gives the smoothing coefficient term for time t . The process will select a slower exponential moving average in oscillating stocks and a faster exponential moving average during fast moving trends. Adaptive moving average is defined as follows:

$$AMA_t = AMA_{t-1} + C_t(P_t - AMA_{t-1}).$$

Through the use of the dynamic smoothing coefficient, AMA stays virtually flat through sideways markets, while rapidly following price changes in bullish or bearish markets.

AMA is used in Trading Rule 2, the $\gamma\sigma$ -Filter, which sets buy and sell signals in terms of the AMA standard deviation (σ).

Trading Rule 2 $\gamma\sigma$ -Filter

1. Buy when the AMA rises above prior N -period low by an amount greater than γ standard deviations and the current price is above the AMA.
2. Sell when the AMA falls below a prior N -period high by an amount greater than γ standard deviations and the current price is below the AMA.
3. Close any open position when current price crosses AMA.

A one and two standard deviation filter are implemented in this paper. The use of filters prevents rapid buying and selling as the price nears AMA. An open position is closed when the current price crosses the adaptive moving average.

Bollinger bands

Bollinger (1992) believed volatility was a key variable in making trading decisions and tested a number of volatility measures before selecting standard deviation as the method by which to set band width. He became especially interested in standard deviation because of its sensitivity to extreme deviation. As a result, Bollinger bands are extremely quick to react to large moves in asset price.

The construction of Bollinger bands is straightforward. Bollinger (2002) starts with a simple moving average to capture the central tendency, the bands are built above and below by a constant multiplied by moving standard deviation. The defaults for Bollinger bands are a 20-day calculation – approximately the number of trading days in a month – and ± 2 standard deviations. If the calculation period is shortened, it will be necessary to reduce the number of standard deviations

used to set the bandwidth, and if the calculation period is lengthened, it will be necessary to widen the bandwidth. With a sample size of 30 or greater, ± 2 standard deviations should contain about 95 % of the data. Therefore, because the sample size is less than 30, the calculation is sufficiently robust.

A simple yet effective trading method is trading stocks when they fall outside of the bands. For example, if a price falls outside the positive band, then take a short/long position with three target exit areas: (1) upper band, (2) middle band or (3) lower band. Here the researchers use two more sophisticated strategies: (1) double bottoms and (2) bottom reversal.

Bollinger bands are used in Trading Rule 3, *Double Bottom*, and Trading Rule 4, *Bottom Reversal*.

Trading Rule 3 Double Bottom

1. Buy when the stock has had two consecutive local minimums, touched the lower band at least twice, and has remained below the moving average between the local minimums.
2. Close the position when the stock price touches the upper Bollinger band.

Bottom Reversal may be viewed as an improvement of the *Double Bottom*.

Trading Rule 4 Bottom Reversal

1. Buy when the stock has been below the lower band for at least two consecutive days and the price has increased from the previous day but still remains below the lower band.
2. Close the position when the stock price touches the upper Bollinger band.

Commodity channel index (CCI)

Developed by Donald (Lambert 1983) and featured in Commodities magazine, the Commodity Channel Index (CCI) is a versatile indicator that can be used to identify a new trend or warn of extreme conditions. Lambert originally developed CCI to identify cyclical turns in commodities, but the indicator can be successfully applied to indices, ETFs, stocks and other securities. In general, CCI measures the current price level relative to an average price level over a given period of time. CCI is relatively high when prices are far above their average. CCI is relatively low when prices are far below their average. In this manner, CCI can be used to identify overbought and oversold levels.

The first step in measuring CCI is to calculate the Trading Price (TP). Trading Price represents the average of the high, low, and closing price for a trading day, where the high is the highest price a stock recorded in a given day. Conversely the low is the lowest price a stock recorded in a given day and the closing price is the end of day price of the stock. A 20 day moving average of TP is generated. The mean deviation of TP is the average absolute difference of an individual TP and the 20 day moving average. The more volatile the stock the larger the mean deviation will be. CCI is defined as the difference between the current days TP and the moving average divided by mean deviation. Let t be the current time and SMA the simple moving average. Then CCI is calculated as follows:

$$TP = (\text{High} + \text{Low} + \text{Close})/3$$

$$\text{Mean Deviation} = \sum_{i=0}^{19} |TP_{t-1} - TP_{20\text{day SMA}}| / 20$$

$$CCI = (TP - TP_{20\text{day SMA}}) / (0.015 * \text{Mean deviation})$$

CCI seeks to measure large variations in TP. This is more likely to occur when the high, low, and closing price is close together and has a larger deviation from the previous day's trading price. In other words, CCI attempts to identify trends and trend reversals early. High positive readings indicate that prices are

well above their average, which is a show of strength. Low negative readings indicate that prices are well below their average, which is a show of weakness.

CCI can be used as either a coincident or leading indicator. As a coincident indicator, surges above ± 50 reflect strong price action that can signal the start of an uptrend. Plunges below -50 reflect weak price action that can signal the start of a downtrend.

CCI is used to define the thresholds for the *Trend Reversal* strategy:

Trading Rule 7 Trend Reversal

1. Take short position if CCI is greater than 50
2. Take long position if CCI is less than -50
3. Close position if CCI crosses 0

CCI is an unbounded oscillator in the sense that, theoretically, it has no upside or downside limits. This makes an overbought or oversold assessment subjective. Securities can continue moving higher after an indicator becomes overbought. Securities would be oversold when the CCI dips below -50 and overbought when it exceeds $+50$. From oversold levels, a buy signal might be given when the CCI moves back above -50 . From overbought levels, a sell signal might be given when the CCI moves back below $+50$. Likewise, securities can continue moving lower after an indicator becomes oversold.

The definition of overbought or oversold varies for CCI. However, ± 200 is a much harder level to reach and more representative of a true extreme. This cutoff is the basis for the following trading rule:

Trading Rule 8 Extreme Trend Reversal

1. Take short position if CCI is greater than 100
2. Take long position if CCI is less than -100
3. Close position if CCI crosses 0

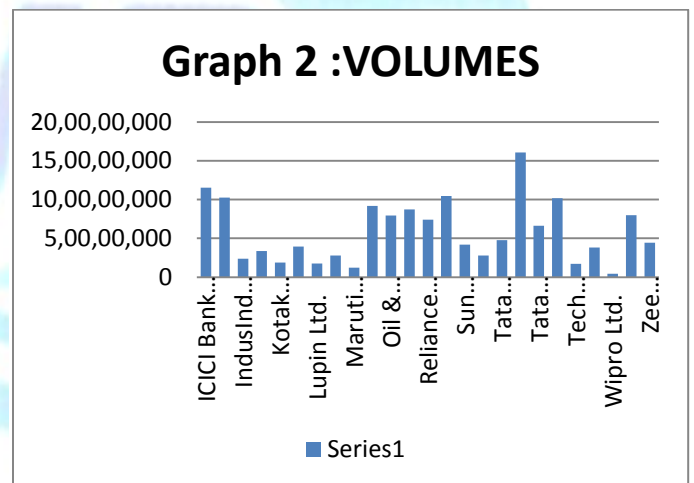
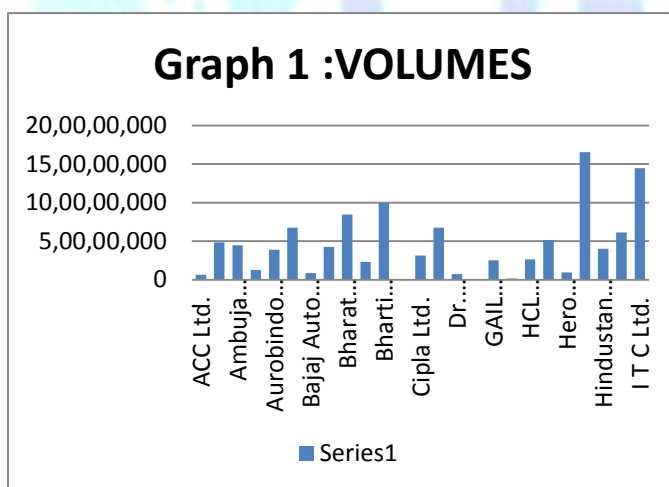
Next section is on the analysis part of the data which is done by using the above strategies.

4. DATA ANALYSIS

The analysis has two sections, the first section explains about the change in the volumes and change in the prices of the nifty 50 stocks. The second section explains the technical trading strategies which are been analysed in the study.

4.1 CHANGE IN VOLUMES

The average change in volumes of the Nifty 50 stocks on monthly basis for period 2011-2015 is shown in the graphs.



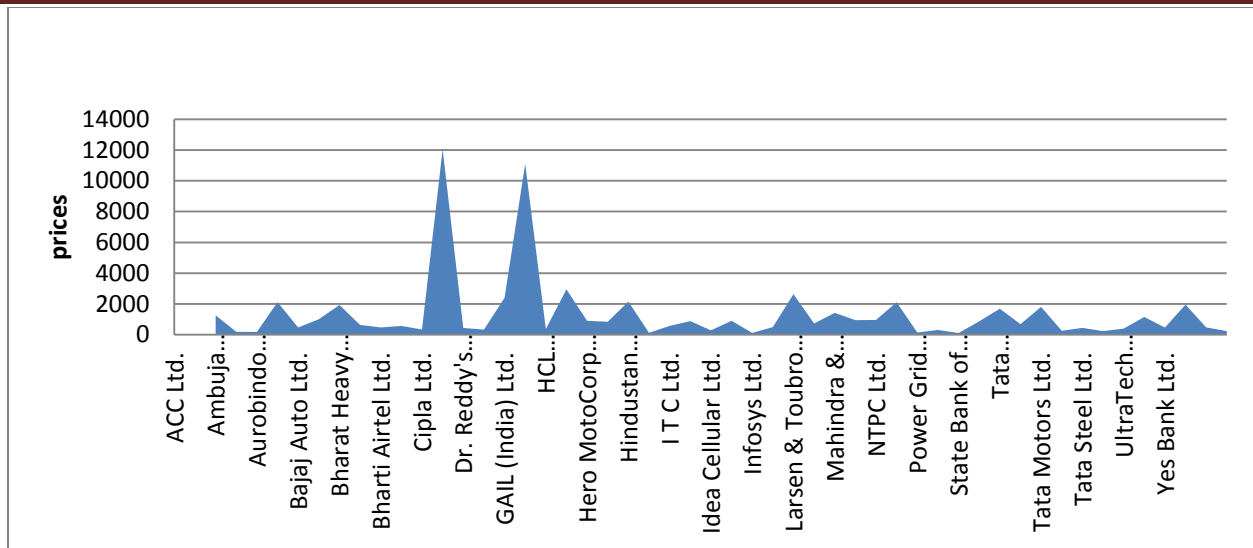
Among the Nifty 50 stocks, the stocks which are traded in the large volumes are ITC Ltd, Hindalco Industries Ltd., Bharati Airtel Ltd, Tata steel Ltd, Tata motors Ltd and State bank of India.

The stocks which are traded in low volumes are ACC Ltd, Bosch Ltd, Eicher motors Ltd, Grasim Industries Ltd., Hero motocorp Ltd and wipro Ltd, considering the similar graphs.

4.2 VOLATILITY

Volatility is the changes in the traded prices of the stocks. If the stocks are less volatile then the prices are not subjected to much fluctuations and the the stocks are more volatile than the prices are drastically fluctuating. High volatile stocks are considered to be more risky.

Graph 3: The volatility of Nifty 50 stocks is represented below



Among the 51 stocks of Nifty 50, the stocks which are more volatile are Eicher motors Ltd and Bosch Ltd.

4.3 Data analysis of the trading strategies

This section includes the analysis of the technical strategies which is represented in the following graphs. The first section shows the Simple moving averages of the stocks, second section shows the Adaptive moving average, the third section shows Bollinger bands and the last section shows the commodity channel index indicators and it also shows the respective buy and sell signals for the investors.



INDICATES
BUY

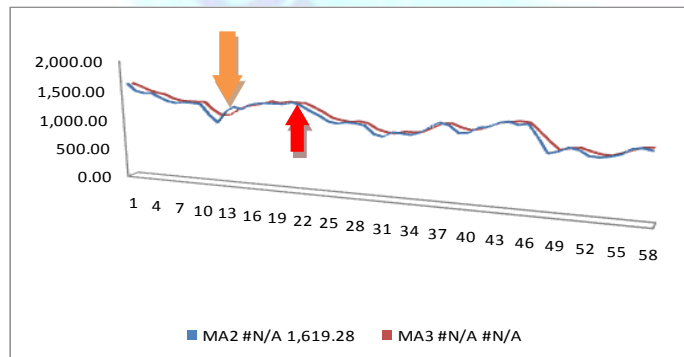


INDICATES
SELL

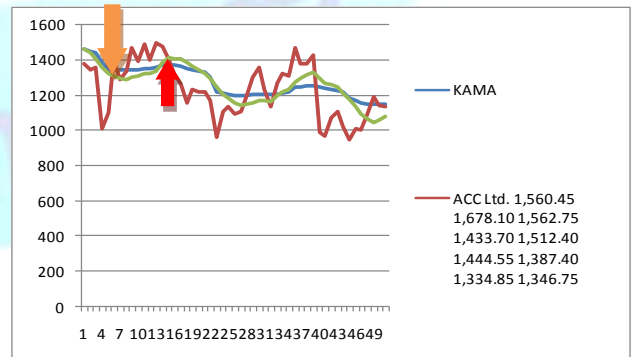
ACC LTD

Graph 4 :Moving Average

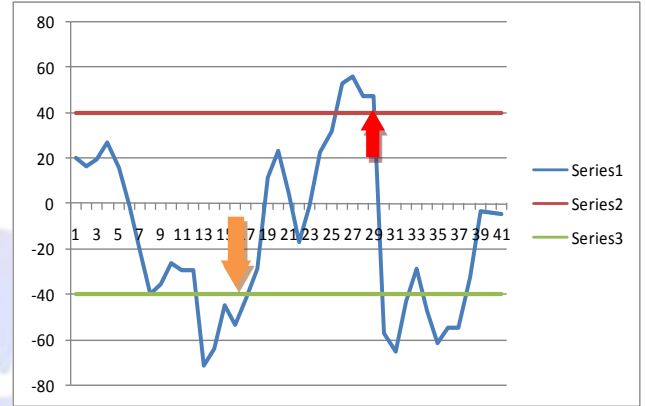
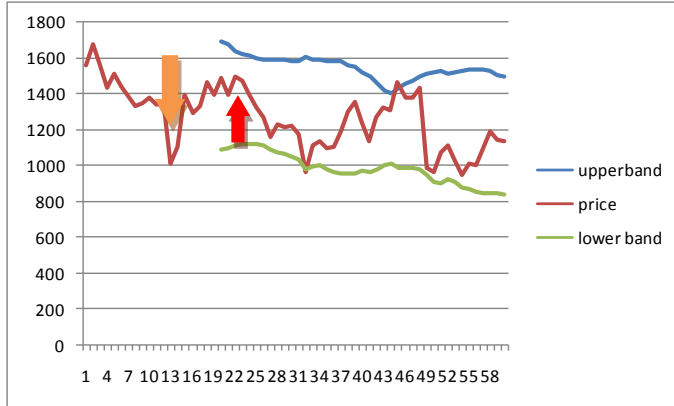
Graph 5: Adaptive Moving average



Graph 6: Bollinger Band



Graph 7: CCI



The moving averages, adaptive moving averages and Bollinger band are correlated with each other whereas CCI shows the signal in later stages.

As the above graphs, the calculations are done and the graphs are plotted for all the stocks in the Nifty 50 index. The summary of these calculations are summarized in the following table.

Table 1. Summary calculations using moving average, KAMA, Bollongers Band and CCI

company name	INDICATORS							
	MOVING AVERAGE		KAMA		BOLLONGERS BAND		CII	
	BUY(Rs)	SELL(Rs)	BUY(Rs)	SELL(Rs)	BUY(Rs)	SELL(Rs)	BUY	SELL
ACC Ltd.	1159	1437.75	979.65	1379.05	1311.34	1416.16	-40	40
Adani Ports and Special Economic Zone Ltd.	167.2	234.8	228.49	105.55	146.95	319.05	-40	20
Ambuja Cements Ltd.	185.1	220.8	198.13	215.1	159.15	228.85	-60	42
Asian Paints Ltd.	1999	3335.73	752.3	507.6	752.3	4681.25	-45	45
Aurobindo Pharma Ltd.	542.3	804.65	679.4	187.4	1135.7	471.55	-50	50
Axis Bank Ltd.	786	1832.22	529.29	1918.85	449.1	1918.85	-30	30
Bajaj Auto Ltd.	1924	2536.63	2174.14	2640.8	1901	2640.4	-60	40
Bank of Baroda	352.5	975.83	548.84	867.75	156.65	1087.2	-40	40
Bharat Heavy Electricals Ltd.	181	239	202	283	240	256	-40	40
Bharat Petroleum Corporation Ltd.	400	696	600	646	243	743.75	-40	40
Bharti Airtel Ltd.	306	395.47	338	382.4	287.4	405.2	-50	40
Bosch Ltd.	10149	14359.45	13688.66	14385	8973.75	18919.85	-40	40
Cipla Ltd.	392.6	632.78	483	666.5	365	666.5	-40	40
Coal India Ltd.	293	396	311.7	353	247.45	383.85	-40	40
Dr. Reddy's Laboratories Ltd.	3400	4248.3	2916	3246.2	2460	3606	-40	40
Eicher Motors Ltd.	2958	3877	1070	2340	1176	2705	-40	40
GAIL (India) Ltd.	420	466	377	444	377	528	-40	40
Grasim Industries Ltd.	2752	3528	3196	9598	2260	3315	-40	40
HCL Technologies Ltd.	863	1396	934	1596	688	1262	-40	40
HDFC Bank Ltd.	625	659	587	703	591	655	-40	40
Hero MotoCorp Ltd.	2237	3136	2386	3147	1967	3064	-40	40
Hindalco Industries Ltd.	81	180	100	160	84	191	-40	40
Hindustan Unilever Ltd.	586	773	670	768	570	786	-40	40
Housing Development Finance Corporation Ltd.	837	961	1022	1160	880	1160	-40	40
I T C Ltd.	302	327	334	348	325	363	-40	40
ICICI Bank Ltd	268	1053	293	1626	274	133	-40	40
Idea Cellular Ltd.	159	169	141	158	116	169	-40	40
IndusInd Bank Ltd.	490	757	591	435	383	802	-40	40
Infosys Ltd.	1964	3553	1383	1972	1087	3598	-40	40
Kotak Mahindra Bank Ltd.	670	972	760	992	657	1263	-40	40
Larsen & Toubro Ltd.	1190	1495	1333	1509	985	1701	-40	40
Lupin Ltd.	936	1454	1187	1480	881	1480	-40	40
Mahindra & Mahindra Ltd.	1027	1323	1158	1234	890	1407	-40	40
Maruti Suzuki India Ltd.	1732	3338	2636	3346	1636	3346	-40	40
NTPC Ltd.	116	150	129	160	116	160	-40	40
Oil & Natural Gas Corporation Ltd.	237	421	275	405	234	435	-40	40
Power Grid Corporation of India Ltd.	98	140	119	138	105	139	-40	40
Reliance Industries Ltd.	933	1010	915	978	831	1006	-40	40
State Bank of India	237	1512	267	321	250	270	-40	40
Sun Pharmaceutical Industries Ltd.	739	788	704	826	632	951	-40	40
Tata Consultancy Services Ltd.	2251	2662	2342	2558	2425	2736	-40	40
Tata Motors Ltd DVR	193	352	260	335	174	377	-40	40
Tata Motors Ltd.	341	523	391	533	349	533	-40	40
Tata Power Co. Ltd.	67	93	70	82	98	105	-40	40
Tata Steel Ltd.	307	533	282	468	246	553	-40	40
Tech Mahindra Ltd.	947	1796	548	2245	533	2593	-40	40
UltraTech Cement Ltd.	523	582	443	559	352	559	-40	40
Wipro Ltd.	2013	2569	2387	2676	1710	2676	-40	40
Yes Bank Ltd.	342	647	570	772	307	772	-40	40
Zee Entertainment Enterprises Ltd.	267	381	294	380	266	381	-40	40

- Buy the stock

1. 2 month's moving average crosses the 3 month's moving average line from above
 2. Price is above the KAMA line
 3. When the price touches the lower band
 4. When CCI is greater than 40
- Sell the stock
 1. 2 month's moving average crosses the 3 month's moving average line from the below
 2. Price is below the KAMA line
 3. When the price touches the upper band
 4. When CCI is less than -40

5.CONCLUSION

The stocks in Nifty 50 are not much volatile. Very few stocks are volatile which makes the nifty 50 index less volatile prices do not change drastically in the Indian security market. Among the Nifty 50 stocks 36 stocks are traded below the average volume and 24 stocks are traded above the average volume.

The technical trading strategies will be helpful for an investor to find an opportunity to invest at the right time in any of the stocks. Since Nifty 50 is a diversified index it is profitable for investor to invest in these stocks to earn more returns. Among the Nifty 50 stocks most of the stocks shows that the technical trading strategies are correlated with each other whereas for few stocks Simple moving average, Adaptive moving average and Bollinger bands are correlated whereas the signals showed by Commodity channel index is not correlated with the signals showed by the other strategies.

Hence by this study it can be concluded that the investors can use Simple moving average, Adaptive moving average and Bollinger's band often to identify the buy and sell in any of the stocks of Nifty 50. Among all the strategies commodity channel index is not correlated with other strategies hence the investors can rely on other strategies.

There are many other technical trading strategies which can be used to indicate the buy and signals. This study focuses only on Simple moving average, Adaptive moving average, Bollinger's band and Commodity channel index. Further study can be done by using other technical strategies to indicate these signals.

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