A RESEARCH PROJECT REPORT ON

“Can the market of Cryptocurrency be followed with a Technical Analysis”

Project Report submitted in partial fulfillment for the award of

BACHELOR OF BUSINESS ADMINSTRATION

Submitted by

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Certificate of Approval

This is to certify that the project report **"Can the market of cryptocurrency be followed with technical analysis?"** has been prepared by **Rachit Jain, Puru Bhardwaj and Priyanshu Soni** under my supervision and guidance. The project report has submitted towards the partial fulfilment of 3year, Full time BACHELOR OF BUSINESS ADMINISTRATION.

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DECLARATION

We hereby declare that this submission is our own work and that, to the best of our knowledge and belief, it contains neither any material previously published or written by another person nor any material which has been accepted for the award of any other degree or diploma of the university/other institute of higher learning, except where due acknowledgment has been made in the text.

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Date :

Acknowledgement

I am using this opportunity to express my gratitude to everyone who supported us throughout the course of this BBA project. We are thankful for their aspiring guidance, invaluably constructive criticism and friendly advice during the project work. I am sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project.

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Thanks

Executive Summary

This study is an attempt to know how technical theories can be applied to cryptocurrencies. As a student of BBA, it is part of our study to write a research paper. We get an opportunity to do this research on the topic of Can cryptocurrency be followed with technical analysis?

Technical Analysis involves using mathematical indicators based on previous price action data to try to predict future trends. The basic idea is that markets behave according to certain patterns and that once established, trends heading in a certain direction often continue along the same course for some time. Conducting Technical Analysis before entering a position is one way to try to identify price levels that might be considered low.

There is no single, all-encompassing method for Crypto technical analysis. Each trader will prefer to use different indicators and will likely interpret them slightly differently. It should also be noted during our research that no technical analysis is anywhere near 100 percent predictive.

There is only one method used in the competition of this Project Report- Secondary Data.

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Abstract

This paper focuses on the role of technical analysis in cryptocurrency and whether cryptocurrency can be followed with technical analysis or not. During this study, we have used the most established technical tools and indicators like the Candlestick pattern, volumes, trends, the Moving Average, Moving Average Convergence Divergence, the Relative Strength Index, Bollinger Bands, Fibonacci Retracement, and etc. By analyzing Bitcoin charts, the results indicate that the indicators can be used to generate a significantly positive return. It is found that cryptocurrency can be followed with technical analysis like equity market and forex market. We have used charts that explain how Bitcoin can be traded through technical analysis which is the most hyped-up topic for today's generation.

Keywords: Technical Analysis, Cryptocurrency, bearish, bullish, traders, candlestick pattens, technical indicators, securities, Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Bollinger Bands and, trends.

Introduction

The last century has witnessed the remarkable growth of the financial sector and financial instruments. Financial systems are actively developing, transforming, and adjusting to certain economic and technological necessities. During this tenure, we have seen the growth of assets class like equities, debt securities, gold, private equity, real estate, hedge funds, etc but last 10 years we have majorly seen the growth of digital assets and now when we talk about digital asset one name comes in everyone mind is Cryptocurrency.

Cryptocurrency is a revolution for the financial sector and for the investors but it seems like it is the most abused investment class because there are clouds of uncertainty which has formed over time. Many interpret that it is the riskiest type of investment class because of its volatility and retrospectively it has proved that it is highly volatile, look at the bitcoin upsurge and downside in the span of 1 year which raises the eyebrows of investors and governments. That's why every government has its own opinion on cryptocurrency while some countries look at crypto as an opportunity while some are not fascinated by the idea of cryptocurrency. But there is the catalyst of cryptocurrency who believes it is not that risky for the investment and any astute individual who knows technical analysis can invest in crypto & can make fortune out of it.

According to tomorrowmakers.com, there are 15,000+ cryptocurrencies and among them, Bitcoin and Ethereum are the two biggest cryptos by Market Capitalisation. And bitcoin is the one that has changed the scenario of crypto as it is widely regarded as the first modern cryptocurrency. In late 2012, WordPress became the first important service provider to accept Bitcoin. Others, which include online electronics retailer Newegg.Com, Expedia, Microsoft, and Tesla followed. Countless traders now view the cryptocurrency as a valid payment method. But the fun fact about Bitcoin is that the total amount of bitcoin is limited in the world, you can’t mine on your wish and that’s why it has a big impact on the price because the supply is constant here but whenever demand increases, the prices automatically increase because of supply and demand gap. Bitcoin is considered a limited resource like gold or oil. For the mining of bitcoin, an individual needs high technology-based machinery which is too expensive for normal people so there are not many who can mine the bitcoin. According to Sunbird, China is the largest farmer of bitcoin, they mine 3 % of all Bitcoins and mine 750 bitcoins every month.

This study fills the gap on whether the cryptocurrency can be analyzed by technical analysis and can give us an adequate signal and can we take trades based on those signals or not. This study is best suited for short-term investing particularly for 10 days to 1 month period, and the methods and tools which will be used in this study will be best suited for short term trading, and an individual who will read and understand this study can apply the methodology and tools in stock trading also.

What is Cryptocurrency?

A cryptocurrency is a digital asset that can circulate without the need for a central monetary authority such as a government or bank. Instead, cryptocurrencies are created using Cryptographic techniques that enable people to buy sell, or trade them securely.

Bitcoin and most other cryptocurrencies are supported by a technology known as the blockchain, which maintains a tamper-resistant record of transactions and keeps track of who owns what. The creation of blockchains addressed a problem faced by previous efforts to create purely digital currencies: Preventing people from making copies of their holdings and attempting to spend them twice.

The units of cryptocurrencies are referred to as coins or tokens. Some are used as units of exchange for goods and services, others are stores of value, and some are mostly designed to help run computer networks that carry out more complex financial transactions.

Cryptocurrencies are created through a process called mining, which is used in Bitcoin. Mining can be an energy-intensive process in which computers solve complex puzzles to verify the authenticity of transitions on the network. As a reward, the owners of those computers can receive newly created cryptocurrency. Other cryptocurrencies use different methods to create and distribute tokens, and many have a significantly lighter environmental impact.

A cryptocurrency blockchain is similar to a bank's balance sheet or ledge. Each currency has its blockchain, which is an ongoing, constantly re-verified record of every single transaction ever made using that currency.

Cryptocurrency does not exist in physical form (like paper money) and it's typically not issued by a central authority. Cryptocurrencies typically use decentralized control as opposed to a central bank digital currency (CBDC) When a cryptocurrency is minted or created before insurance or issued by a single issuer, it is generally considered centralized. When implemented with decentralized control each cryptocurrency works through distributed ledger technology, typically a blockchain, that serves as a public financial transitions database.

In today’s world, cryptocurrencies exist only online. Cryptocurrencies use encryption to authenticate and protect transactions hence their name. There are currently over a thousand different cryptocurrencies in the world.

What is Technical Analysis?

Technical analysis is the analysis of the price and volume of the assets class. With the help of technical analysis, an individual can make a future prediction based on past data and that data is presented in the form of charts like Bar charts, Candlesticks charts, line charts, etc. It is one of the tools which is used by traders frequently for short-term investment purposes. Through this not only short-term investment decisions can be made but also long-term investment decisions. There are three principles of technical analysis, first one is that all the available information in the market is already contained in the stock prices, the second is that stock price generally moves in trend and the last one is that history repeats itself.

The concept of technical analysis is so special because like in fundamental analysis an investor needs to understand the economy, industry, and company which requires lots of commerce background backing, and the people who choose the other core program struggle to understand the fundamental analysis but technical analysis is much easier to grasp even for the person who has zero knowledge related to finance and commerce.

Significance of the Study

Several people in the world think cryptocurrency is not predictable and where the price is like drunk man nobody knows what will be the next step when the price will go up or down. During this study our main focus was on, is it possible to follow Cryptocurrency with technical analysis like the equity market, forex market, etc. Because in all of these technical analyses do wonder. This study shows the idealization of how cryptocurrencies use the technical analysis also how they can be used to accumulate money and earn a huge rate of interest on investments made over time.

The study demonstrates how Bitcoin can be traded through basic methods and give out huge returns as all the information is available on the internet to trade from platforms like Trading view, Wazir x, etc.

So, the significance of our study becomes bigger because we didn't just show the analysis of whether it works on cryptocurrencies like Bitcoin and Ethereum or not but we have explained the all concepts very well and efficiently. A person who has zero knowledge about technical analysis or even about cryptocurrency will get a fair idea after reading this thoroughly. We have covered all the main aspects of technical analysis in this study which will help the investor or any beginner to invest in cryptocurrencies or even in the stock market, forex market, etc. Through this study, a person will be able to know about the concepts like Support and Resistance levels and how someone can make an entry based on that, about the volumes and how we can analyze the volumes, and how we can implement our trading style, about the trends and how any trend is formed and what are signals of a trend reversal, about some major candlesticks pattern, about MACD and how it gives signals to take a buy call and sell call based on it, about Moving Averages which is a lagging indicator and how we can take trades and what are the strategies we use in that, about Relative Strength Index, Bollinger Bands. So we have covered all of these and we have taken real-life chart examples and how we can implement those techniques in real-time based on how certain patterns should be formed to take an entry and exit. All of these things were related to how we can make profits but we have not forgotten in this study how we can limit our losses while investing in cryptocurrency and we have given viable options for putting a stop-loss and also how someone can set price targets and how much they should aim for in particular time frame.

The objective of the Study

The objective of the study is to determine whether we can analyze the cryptocurrency with the help of technical analysis or not and if we can analyze so how any individual can take trades based on technical analysis and what should be the ideal methodology to follow during the technical analysis for the swing trading.

Research Methodology

Research Design

In this study, we have done quantitative research and analytical research because our main focus was on proving whether we can analyze cryptocurrency with the help of technical analysis or not. So, in order to do that, we have taken the technical charts from sites like Trading View and Investing.com, and with the help of those charts we have proved technical analogies and we have analyzed the technical charts, and explained how indicators or technical analysis tools affect the price and decision making of when to enter and exit and conclusion have been made on the basis of it.

Source of Data

This research is based on secondary data as we used the data which already existed but with the help of the data, we have analyzed the cryptocurrencies like Bitcoin and Ethereum and made specific judgments on them and we conclude the data basis on the facts and methodologies.

Tools Used in This Study

TRENDS

Trends indicate the direction in which the price of the security will move. There a famous saying related to trends is “Trend is your friend until the end when it bends”. In my opinion, trends and volumes are the most essential thing in technical analysis because it gives the traders a rough idea about the behavior of the asset.

Trends are a combination of up moves and down moves. There are three types of trends.

1. **Uptrend**- A uptrend is formed when higher highs and higher lows are formed. Uptrend is a great friend of bulls. Bulls dominate the market in uptrend they put buying pressure more and more so that the price of the asset will rise and the asset will make newer highs.

The best time to buy an asset in an uptrend is when the price of an asset pulls back. There is one myth in the market that buy at low and sell at high but we don't believe in that statement because we firmly believe that if the asset is showing no signs of weakness why to sell at high and let the price of security rise more and this is our thumb rule that "NEVER SELL IN AN UPTREND". Yes, if it's giving reversal signals then sell the asset and, in an uptrend, the reversal signal will be formed when the Lower high is formed and then the Lower low is formed.

In the above chart, down arrows indicate the higher highs, and up arrows indicate the higher lows.

2. **Downtrend** – A downtrend is formed when lower highs and lower lows are formed. The downtrend is well-liked by bears who love to trade when the market is down. If anyone wants to short the position then first wait for the impulse down and then wait

for the correction and during the correction time, enter the market. One of the thumb rules of downtrend is “Never Buy in Downtrend”. There is a famous saying related to downtrend is “Never catch a falling knife”. The end of a downtrend can be spotted when the asset makes higher highs after the lower highs.

3. **Sideways Trend**- Sideways trends are formed when highs and lows are in the same range. A sideways trend is the bread and butter of intraday traders. Because in sideways trend they can bet a small price point which they want to achieve. Short-term investors in sideways trends should apply a wait and watch strategy and should wait for the breakout.

Volumes

A Volume measures the number of trades is taken place in a particular time frame. Volumes can indicate market strength, as rising markets on increasing volumes are typically viewed as strong and healthy. When prices of the increasing volumes fall, then the trend is gathering strength to the downside. Trading volume is a technical indicator because it represents the overall activity of a security or a market. Investors often use the trading volume to confirm the existence, or a continuation, of a trend or trend reversal. Essentially, trading volume can legitimize a security’s price action, which can then aid an investor in their decision to either sell or purchase that security. Trading volume can help an investor to identify momentum in security and confirm a trend. If the trading volume increases, then the prices generally move in the same direction. That is, if security is continuing higher in an uptrend, the volume of the security should also increase and vice versa.

For example, suppose a particular cryptocurrency has increased its price by 10% over the past month. And if an investor is interested in that cryptocurrency and wants to purchase certain units. But if the investor is not confident that the cryptocurrency will continue in this uptrend and is worried that the trend may reverse. Trading volume can also give a signal when an investor should take profits and sell a security due to low activity. If there is no relationship between the trading volume and the price of a security, then this signals shows weakness in the current trend and a possible reversal is on cards.

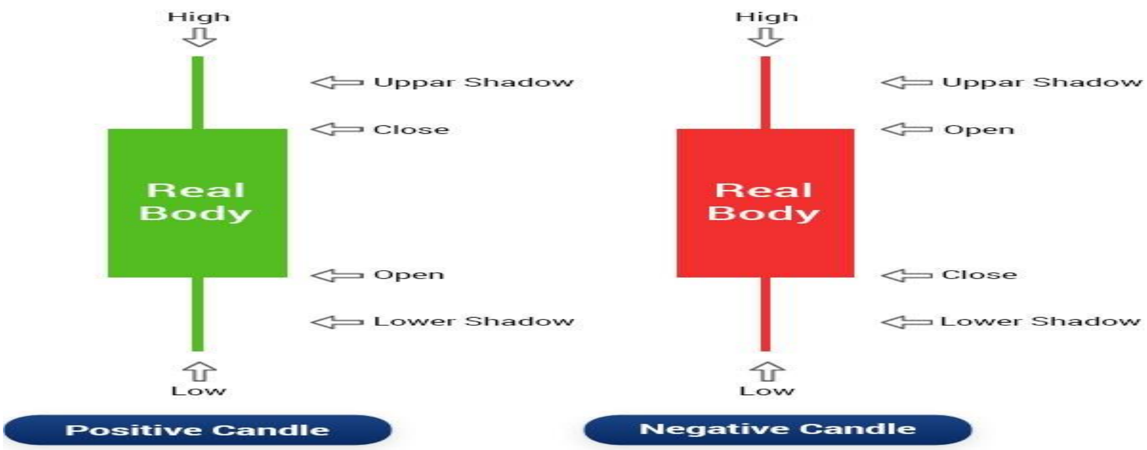
For the analysis of volumes, compare it with the last 5 volume bars. This methodology excellently works in swing trading when we take trades based on particular breakouts. And one thing worth remembering in volumes is that a breakout with increased volumes is a better confirmation of a trend reversal.

ANALYSIS OF HOW VOLUMES CAN BE USED TO KNOW THE BEHAVIOR OF TRADERS:

After the interpretation of the above graph, we can see on 24 February 2022 a big green volume bar is formed it means so many trades have occurred on that particular day and it is supported by the big green candle which is a good scenario if we see the candlestick the closing price is higher than the opening price which indicates that the bulls were in control even bears created the selling pressure and reaches the lowest price of February month but the bulls came alive and they have won the battle against the bears which indicates that in coming time the market can be bullish. But one thing we have analyzed during this study is that based only on volume one can't take trades because sometimes the stock operator who can buy in bulk can influence the prices by entering and exiting at different times and can inflate the prices. So analysing prices with volumes is always a sign of astute person in trading.

Candlesticks

To analyze the fluctuations of the Bitcoin., We have used Candlestick's pattern to gauge the highs and lows of the Bitcoin. A candlestick is a manner of showing information about an asset's price movement. Candlestick charts are one of the most famous components of technical evaluation, permitting investors to interpret price movements. And candlesticks patterns are used in technical analysis by the traders or investors. This basically helps to track day-to-day highs and lows, open and close price of the asset class.



- The Wick- The wick shows the high and low prices of the day. This means higher the wick higher the price and lowers the wick means lower the price.
- The Body- The body of the candlesticks shows the open and close price of the share.
- Green Candlestick- Green Candlestick shows that market is bullish. Simply, Green Candlestick means the closing price of the share is higher than the opening price.
- Red Candlestick- Red Candlestick shows that the market is bearish, Simply, Red Candlestick means that there is a price decrease in the share.

There are many types of candlesticks used by the traders and every candlestick has its formation and meaning but, in this study, we will analyse the most popular candlesticks only and how we can trade based on that we will understand that also.

1. Bullish Engulfing Pattern (Bullish Pattern) – This is a two-candlestick pattern where the second candle (bullish candle) completely engulfs/overlaps the previous day's candle. This type of candle is more powerful when it is made after the bearish trend and after the bearish trend if this candle is made up this shows a bullish trend is coming.

GRAPH OF BULLISH ENGULFING PATTERN:

As we can see in the above picture that on 21 July 2021, the bullish engulfing pattern is formed and after that, we can see a big uptrend in the following days. This trend is most suitable for when someone wants to be bullish and this graph has shown clearly how uptrend has shown by the bitcoin after the bullish engulfing pattern has formed.

2. Bearish Engulfing Pattern (Bearish Pattern) – This is the reverse of the Bullish Engulfing Pattern where the second candle is a big bearish candle that engulfs the first

candle which is a bullish candle. It is powerful when it is formed at the bottom of the uptrend.

GRAPH OF BEARISH ENGULFING PATTERN:

On 15 November 2021, the bearish engulfing pattern is formed at the end of an uptrend and subsequently, we can see that the downtrend has formed this creates the opportunity for short selling and even when the bearish engulfing pattern was formed, we can also take a sell call from that point because it shows that now the bullish trend is over and now the bearish trend is coming.

3. Morning Star Candlestick (Bullish Pattern) – It is a bullish three candlestick pattern formed at the bottom of a downtrend. It is one of the most powerful patterns which shows bullishness.

1st Candle – Big Bearish Candle

2nd Candle- Doji Candle (Candle which is indecisive, it shows the condition where both bulls and bears are fighting but neither wins the fight).

3rd Candle- Big bullish candle which closes near the high of the day.

GRAPH OF MORNING STAR CANDLESTICK PATTERN

On 19 August 2021, the Morning star pattern is formed and it is confirmed by another big bullish candle where we can take an entry, and if someone has taken the entry on 20 august, they might have purchased 1bitcoin at around $47,000 and in the span of 20 days only they can make $5000 on the basis of this candlestick pattern only. This shows how powerful this pattern is. But the thing is we have to wait for confirmation if someone is a passive investor and if someone is an aggressive investor, he/she can enter on 19 august also by seeing analyzing the intraday charts which are minutes and hourly charts but, in this study, we are talking about swing trading so we will stick to it only here.

And one thing you can take as a note is Doji candle doesn't matter in this pattern it can be bullish or bearish what matter is the color of the third candle which should be a bullish candle and also the confirmation candle which is the 4th candle where an individual will take an entry.

4. Evening Star Candlestick (Bearish Pattern) – It is formed when a green candle is followed by a Doji candle which is then followed by a big bearish candle. This will be most powerful when it is formed at the end of an uptrend.

GRAPH OF EVENING STAR CANDLESTICK PATTERN:

See how on 28 December 2021, the evening star candlestick pattern is formed and bitcoin was already bearish for the last 1 month but even if you wait for the evening star confirmation even then you can make a profit by shorting in the short-term.

5. Hammer – It is formed when open, high, and close are roughly the same price. The shadow should be twice more than the length of the body. Hammer is most effective when it occurs at the bottom of the downward trend and is considered a bullish reversal trend. Confirmation needs to be taken (followed by a big bullish candle) should be the immediate next candle.

As we can see on 3 February 2022, the hammer pattern is formed and it is such a beautiful example see how it is confirmed by big green candle and how much in next 6 days the bitcoin has gained. Hammer pattern can give many false signals too like hammer can be formed but after that sometimes-what trader make mistake is they see the hammer and they enter the market but the vital thing is that the confirmation candle and which requires patience because 1000 times it will happen that pattern will be formed but there will be no confirmation so in that scenario there is a high chance we can incur losses.

Same as hammer there is another pattern called inverted hammer. As name suggest it is inverted in shape. Its low, close, open are roughly same.

Hammer and Inverted Hammer color doesn't matter but green candle is always considered more positive.

6. Hanging Man – It is same as hammer but it is formed when there is a uptrend unlike hammer which is formed at the bottom of downtrend. Hanging Man is sign of Bearish Reversal and it get confirmation when it is followed by bearish Red Candle.

GRAPH OF HANGING MAN CANDLESTICK PATTERN

This is the example of Ethereum and looks at how the hanging man is formed on 16 February 2022, and there is a sharp decline in the value of Ethereum what's vital here is the confirmation candle which is a big bearish candle that is formed on 17 February.
There is another candle called Shooting star which is the same as the Inverted hammer shows Bearish Reversal. Powerful when Formed at the top of an uptrend, should be followed by Bearish Candle for Bearish trend.

These are the six major patterns of candlesticks that we have analysed in this study and there are many more patterns that a trader can use like Bullish and Bearish Harami candle, Bullish and Bearish Kicker and etc but We have put emphasis on the top 6 candlesticks patterns which are well easy to analyse according to our opinion.

But the question is whether the candlesticks are enough to make a judgment to enter the market? My answer will be NO as we have to add other indicators also to make a firm judgment whether the cryptocurrency will be bullish or bearish in the coming trend. And we have to understand one thing is that daily such patterns will not be formed, as much we have learned from the stock market or by listening to all traders and investors and reading books that "Patience is the key in investing" if we are disciplined enough to follow strategies and

wait for confirmation one day or another, we will make a profit. So having the right mentality is crucial.
One thing which is worth remembering is that these patterns which we have analyzed will not work 100 out of 100 times because there are so many things that affect cryptocurrency prices so there might be the failure of patterns as the crypto market is also affected by external forces.

Support And Resistance Levels

The Concept of trading level support and resistance are undoubtedly two of the highest attributes of technical analysis. As part of analyzing charts patterns, these terms are used by traders to refer to price levels on charts that tend to act as barriers, preventing the price of a cryptocurrency from getting pushed in a particular direction.

At first, the explanation and idea behind identifying these levels seem easy, but as we find out, support and resistance can come in various forms, and the concept is more difficult to master than it first appears.

Support is a price level where a downtrend can be expected to pause due to a concentration of demand or buying interest, As the price of assets or securities drops, demand for the units of cryptocurrency increases, thus forming the support line.

Meanwhile, resistance zones arise due to selling interest when prices have increased.
Once an area or "Zone" of support or resistance has been identified those prices can serve as potential entry or exit points because, as a price reaches a point of support or resistance, it will do one of two things-bounce back away from the support or resistance level or violate the price level and continues in its direction-until it hits next support or resistance level.
The timing of some trades is based on the belief that support and resistance zones will not be broken. Whether the price is halted by the support or resistance level, or it breaks through traders can "bet' on the direction and can quickly determine if they are correct. If the price moves in the wrong direction, the positions can be closed at a small loss. If the price moves in the right direction, however, the move may be substantial.

GRAPHICAL REPRESENTATION OF SUPPORT AND RESISTANCE LINE:

The red line shows the recent resistance to a price barrier in the chart analysis segmentation. Which stands at a point of 48110$ currently 36 lakhs 61 thousand in Indian rupees. This line can be formed by joining major candles' top wick which is the basic to form a support or resistance trend line.

The support of Bitcoin lies at 32960$ our buying point which is currently the lowest in the chart of Bitcoin so there stands the support line with blue color which also signifies that Bitcoin rose up after this point two times in the month of January. So, therefore giving it the condition to call it at support on 25 lakhs i.e., 32000 $ us dollars.

The recent resistance shows the major formation of candles highlighted with a green color line in the same zone for certain days which also signifies that this price level of 45000$ is a hard one to break i.e.,34 lakhs in Indian rupees.

INDICATORS

Indicators are mathematical tools that can be used to anticipate trends, volatility, and price of various securities.

MOVING AVERAGES

It is one of the most famous indicators used by technical analysts. Moving Average is an effective indicator; however, it is treated as a lagging indicator means it generates "Buy and Sell" calls a bit late. In moving averages, we take the average of the most recent closing prices of the n time period.

In Moving averages, we will use Exponential Moving Averages which apply weighting factors that decrease exponentially.

Here, we will take 5,13, and 26-days EMA. And here is the reason below for choosing this range.

1. 5 days moving average is like analyzing 1 week's data.
2. 13 days moving average is like analyzing 1 fortnight's data.
3. 26 days moving average is like analyzing 1 month's data.

Calculation of Exponential Moving averages – Suppose the Day 1 price of bitcoin is 95, day 2 price is 110, and day 3 price is 100.

As day 3 is the recent day so we will assign more weightage to day 3, and subsequently, the weightage will decrease day by day.

So, the weightage of day 3 is 3, day 2 is 2, and day1 weightage is 1. Now multiply the respective prices with their respective day weightage.

Day 1 – 95*1 = 95

Day 2 – 110*2 = 220

Day 3 – 100*3 = 300

Now we will add these numbers 95+220+300 and the total will be 615. Now add the total weightage of numbers which we have assigned to days prices.

1+2+3 = 6

Now divide the 615 by 6 and the outcome will be 535.84. So this is how we can calculate 5 DEMA, 13 DEMA, and 26 DEMA.

You can set your own ranges by back testing and every trader has their own methodology and techniques they use. Like there are traders who use 55 DEMA (Day Exponential Moving Average), 100 DEMA, and 200 DEMA.

I will use the crossover technique in moving averages. Basically, in the crossover technique when a particular DEMA cuts the other DEMA from below or above it gives us a “BUY” or “Sell” signal.

Buy strategy for moving averages:

1. When 5 DEMA cuts the 13 DEMA from below, it’s an anticipatory buy.
2. When 5 DEMA Cut the 26 DEMA from below, it’s a confirmatory buy.

Sell strategy for moving averages:

1. When 5 Dema cuts the 13 DEMA from above, it’s an anticipatory sell.
2. When 5 DEMA cuts the 26 DEMA from above, it’s a confirmatory buy.

And if 5 DEMA Cuts the 13 & 26 DEMA from below in a single then it is a powerful sign for bulls and vice-versa.

In the majority of cases, the 5 days moving average line will close the current market price. And if the 5DEMA line is above the 13 and 26 DEMA line it shows strength because it means in the last 5 days the average moving price is more than the 13- and 26-days exponential moving average.

GRAPHICAL REPRESENTATION OF DAY EXPONENTIAL MOVING AVERAGES

We can see in this picture that on 16 March 2022, the red line which is the 5 DEMA line cut the Green and Blackline which is 13 and 26 DEMA line from below, and after that, it is visible how it has given a confirmatory ‘Buy’ call in a single day because 5 DEMA cuts the 13 and 26 DEMA on 16 March only and after that, we can see the bitcoin has become bullish. Also, one thing is worth noting here is that the expansion between lines gets bigger day by day which shows how recent prices which are 5 DEMA (red line) outperform the 26 DEMA (Blackline) which means in the short term all traders have shown bullishness in Bitcoin.

Also, we have analyzed a candlesticks pattern and on 14 March 2022, the bullish engulfing pattern has been formed look at how bitcoin has become a rocket, and with the candlesticks already giving signal on 14 March and then on 16 March it has been confirmed by moving averages also. Look at how powerful it is and how interesting it is the thing we have analyzed in candlesticks and now when we are using it simultaneously with moving averages it was surely giving us a buy call signal on 16 March 2022.

Now see this chart and on 17 February 2022, the 5 DEMA cuts 13 and 26 DEMA from above, and subsequently, we can see that market has also become bearish. And if we look closely the hanging man is also formed at the end of the uptrend which is also giving reversal signals.

This is how moving averages work, even an individual can create their philosophy regarding the moving averages many investors use Fibonacci numbers for moving averages length, and also some people use EMA as support and resistance level. But we like to moving averages in a crossover technique because it has given us best results over the time.

Moving Average Convergence Divergence (MACD)

This is a fantastic leading indicator. MACD says price moves afterward but first signs of weakness and strengths are shown.

If we take a cricket example, sometimes what happens is a batsman starts missing the balls first and it indicates to the bowler that batsmen is not in form and it is the indicator that he might get out early today. So, it is a sign of weakness. Similarly, any batsman came and hit a four on his first ball which shows he is in the form today so it shows the signal of strength.

Ideally, we see weakness first and then the price falls.
Similarly, we see strength first and then price rises.

Major Components of MACD:

MACD Line – Generally a blue line (Fast Line)

Signal Line – Generally Orange Line (Slow Line)

Histogram- bars indicate the difference between MACD line and Signal Line)

Calculation Of MACD Line and Signal Line:

MACD is calculated by subtracting 26 days' exponential moving average from the 12 days' Exponential moving average. And how we can calculate Days' exponential moving average is already discussed in the moving averages. By subtracting 26 DEMA from 12 DEMA we get MACD Line. We got various amounts by subtracting the EMAs. MACD line is formed by joining all these dots.

Now after getting the MACD line, we can easily calculate the signal line. The signal line is calculated as 9 Days Exponential Moving Average of MACD.

Strategy for MACD:

If MACD > 0 = Strength

If MACD < 0 = Weakness

If the MACD line cuts the signal line from above it generates the "Sell signal" and if the MACD line cuts the signal line from below it generates the "Buy Signal".

How to Trade with the use of MACD Divergence

Many buyers in the cryptocurrency market like to trade based on trends. Price trends and MACD trends give various signals of bullish and bearish reversal.

A strong bullish MACD divergence occurs when the price of cryptocurrency is making a lower low which is a downtrend but MACD is making a higher high which is an uptrend. This shows that the selling pressure is decreasing in the market and more buyers are entering the market and they are ready to push the prices which indicates a reversal.

And bearish MACD divergence occurs when the price of cryptocurrency is making a higher high which is an uptrend but MACD is making a lower low which is a downtrend. This shows that the buying pressure is decreasing in the market and sellers are entering the market and they are ready for heavy selling which indicates a bearish reversal.

GRAPH OF MACD:

On 5 April 2022, the MACD line which is the blue line cuts the orange line (Signal line) from above it means that bears are getting stronger and the bulls were getting weak and the same thing was shown by the candlesticks as they showed bearish nature recently and even 5 DEMA line is cutting the 13 DEMA line from above which is also giving us signals of anticipatory sell. And if we look at this chart closely, we can see that the MACD indicator was started showing weakness a 5 days ago, and one thing worth noting that the same day the histogram showed weakness the same day big bearish candle was formed too, so there were clear signals that if nothing unexpected happens Bitcoin will become a bearish incoming trend and it really happens when even MACD gave sell signal as a leading indicator.

Now, if we analyze the 15 March 2022 chart, we can see that a hammer candlestick pattern is formed and it is followed by a big bullish candle which is the perfect scenario for the hammer candlestick pattern, simultaneously if we look at the MACD indicator chart on 15 March the there is a crossover, the MACD line cuts the signal line from below which shows the strength of bulls after that we can see that how prices of bitcoin have risen. So this is how we can make decisions based on the MACD signals.

Relative Strength Index

The relative Strength Index is one of the most popular indicators among traders. Some traders believe that if you know the Relative Strength index that means you know technical analysis and they do take trades only based on the Relative Strength Index.

The Relative Strength Index is an indicator of momentum that is used in the technical analysis which measures the magnitude of the recent prices changes to evaluate oversold conditions in the price of a stock or the other assets. The Relative strength index has a reading from 0 to 100 and it is displayed as an oscillator a line graph that moves between two extremes. The indicator was originally developed by J. Welles Wilder Jr. and he introduced this indicator in his seminal 1978 book, which was named “New Concepts in Technical Trading Systems”.

RSI is computed in two parts.

The Formula for the RSI is mentioned below:

Step-1; 100- [1+average loss Average gain 100]

Average Gain or Average loss is used in the calculation as the average percentage of gain or loss during a long back period. In this, the positive value is used by the formula for the average loss. In average gain periods with price, losses are counted as 0 in the calculations. And in the case of average losses the periods are counted as 0 in the calculations. And to calculate the initial RSI value the standard is to use 14 periods.

J. Welles Wilder's theory was that when the Relative Strength Index (RSI) is greater than 30 that generates a ‘Buy Call’ because he believes when RSI is 30 or less that there is an oversold position in the market so which means there are more seller than buyers and the security will be cheap at that time. And if it’s 70 or greater than 70 it generates a ‘Sell Call’ because it is an overbought position.

But here we have taken a different range for the Relative Strength Index and as we gave an example of cricket in MACD same rules we apply here as we do trades based on momentum, like if batsmen are making runs he has a greater chance that he will score runs again so we are kind of applying this theory in Relative Strength Index. When the RSI will be 60 or greater than 60 it will generate a ‘Buy Call’ because it is in an uptrend and this also indicates that the security is doing great that’s why its RSI has reached 60. So, when RSI will be 60 or above 60, we will buy it. If RSI takes multiple (2-3 times) support at 60. Then it is bullish.

On the other hand, If RSI is 40 or less than 40 means it is a downtrend and it generates a ‘Sell call’ If RSI is facing resistance at 40 that means the security is bearish. And if RSI is between 40 &60 this indicates a sideways trend.

GRAPH OF RSI WHEN RSI IS ABOVE 60:

In the above graph on 24 March 2022, the RSI line crosses 60 and if we look at the candlesticks simultaneously Evening Star Candlestick Pattern is formed after crossing 60 see how the prices of Bitcoin became a rocket and in the span of 5 days if someone has taken this trade if that investor had 1 bitcoin, they might end up making $5000-6000 which is an insane amount of profit in such short period. And even if someone wants to hold their position then after that RSI takes the support of 60 two times which is showing bullishness but when it went below 60 a someone who has made enough profit can square or we can hold our position but, in this case, first the shooting star is formed and even evening star is also formed just after 2 days so it is better to book profit at that time. And one can also analyze this position by MACD what it is showing if MACD is also giving signal Sell then we must book our profit in this situation.

GRAPH OF RSI WHEN RSI IS BELOW 40:

If we analyze this graph on 12 May 2021 the RSI line went below 40 and after that see how the price of bitcoin dipped. And if someone wants to short position on bitcoin it is the best time to do so because if we analyze the candlesticks also it is a big red candle which is a positive sign for those who want to short and it's a bad signal for those who are holding this stock so now, they have to square off their position.

So this is how we can analyze the Relative Strength index, we can follow the traditional or the way which we have discussed in this study both will give good results but we are momentum traders so we like to use the range of 40 and 60.

Fibonacci Retracement

Fibonacci retracement is a method of technical analysis for determining the support and resistance levels. Its name has given after the Fibonacci sequence of numbers whose ratios generally provide price levels to which markets tend to retrace a portion of a move before a trend continues in the real or original direction. In the general world, the importance of Fibonacci numbers is significant as it is believed that these numbers are evident in architecture, art, and even in nature.

People firmly believe that if the Fibonacci number sequence is followed in so many aspects, it can be followed in trading also.

A Fibonacci retracement can be made by taking the two extreme points on a chart and dividing the vertical distance by their important Fibonacci ratios. The Retracement is considered to start when it is 0 % while 100 % is a complete reversal of the original price before the move. The Horizontal lines are drawn in the chart for these price levels to provide support and resistance levels. The common levels in the chart are 23.6%,38.2%,50% and 61.8%.

The appearance of retracement can be ascribed to price volatility as described by Burton Malkiel; he is a Princeton economist which he describes in his book. A Random Walk Down Wall Street.

A Fibonacci retracement is a popular tool that is used by technical traders to identify strategic places for transactions, The Retracement concept is used in many indicators such as Gartley patterns, Elliott Wave theory, Tirone levels, and many more. After a weighty movement in price, the new support and resistance levels are often at these lines.

Unlike moving averages, Fibonacci retracement levels are also Static Prices and they do not change, this will allow quick and simple identification and it will allow traders and investors to react when price levels are tested. Because these levels are inflection points, so the traders expect some type of price action, whether it's a break or a rejection.

Fibonacci numbers are derived as follows:

Step 1 – Take the binary numbers 0 and 1.

Step 2 – Keep adding the current number with the previous number.

Step 3 – Thus the sequence will be 0+1 = 1, 1+1=2, 2+1 =3, so the number are 1,2,3,5,8,13,21,34,55,89,144,233---------

Now as we talk about the levels from which generally the price of asset retraces, those levels are determined by the Golden Ratio.

Golden Ratio- A creation of Fibonacci number sequence is computed as

21/34 = 0.618 or 61.8%

21/55 = 0.381 or 38.1%

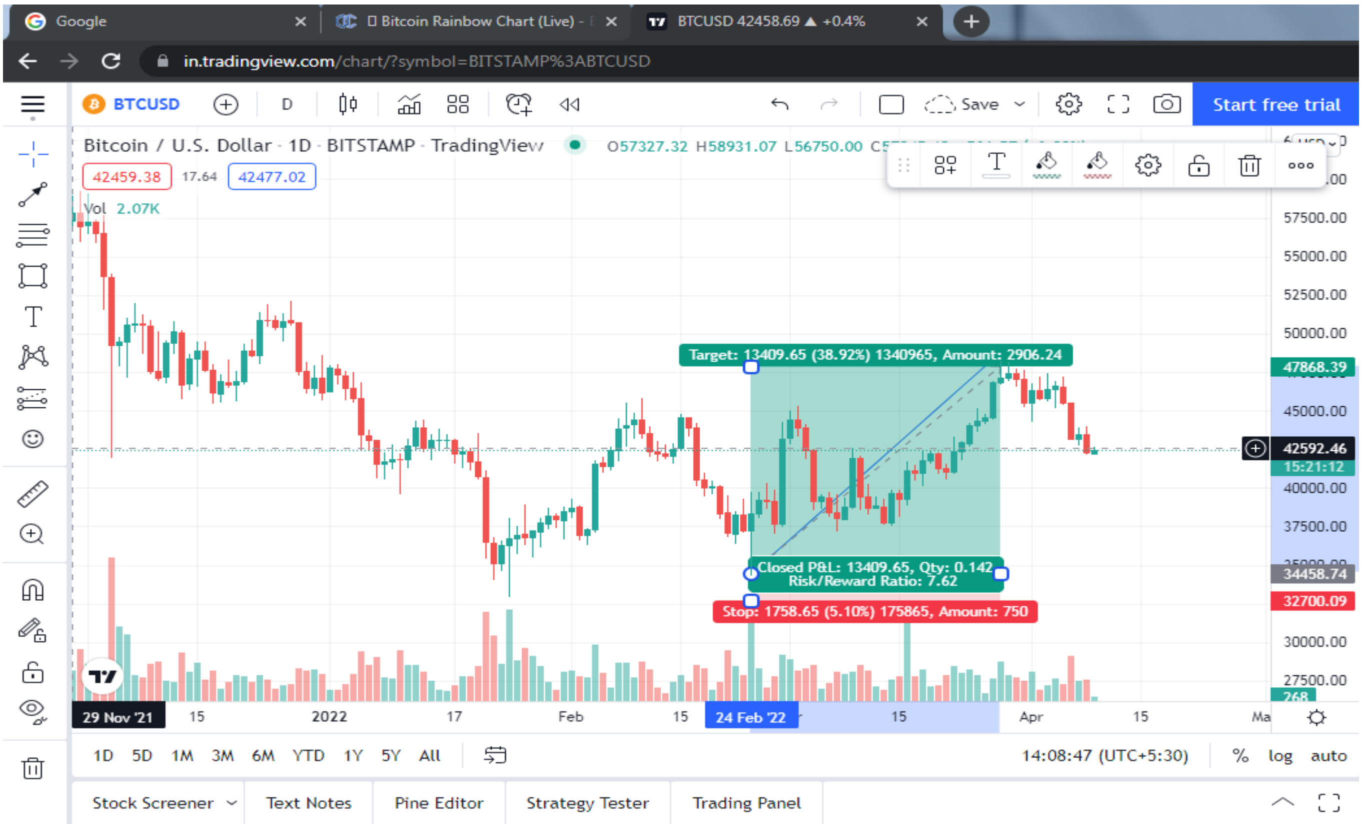
21/89 = 0.236 or 23.6%

In the calculation of the Golden Ratio, we have to take the number and divide it by the next number, the second next number, and by the third next number. And the ratios will come the same only a minor difference in points will be there.

ANALYSIS THROUGH FIBONACCI RETRACEMENT, ENTRY POINT, AND EXIT POINT IN THE TRADE OF BITCOIN:

The blue colour ratio zone is showing the basic support levels of Bitcoin, the green levels showing a temporary resistance but also a short trade to enter again and book your profits.

The red colour ratio zone shows high level of resistance from the entry point and the direction of the trade that is at a high point the trend may change and the valuation of Bitcoin might go down from there. Also signifies this as the exit point of the trade.



The above chart explains the whole theory of TRADING BITCOIN THROUGH TECHNICAL ANALYSIS where the point we entered is on 27th of January at 32900$ i.e., 25 lakhs Indian rupees and hold the trade for a period of 2 months and sold it on 27th March at a point of 48600$ i.e., 36 lakhs and 61 thousand Indian rupees which denote a profit of 11 lakhs 60 thousand Indian rupees in the current time frame.

Bollinger Bands

The term "Bollinger" comes from the surname of a trader named John Bollinger. In the trading view, the Bollinger band is an indicator tool that helps traders to put a different trading setup which is somewhat similar to RSI (Relative strength index) and EMA (Ease of Movement).

This tool helps in setting trend lines through a cloud that forms around the trending line and eventually acts as an indication to predict certain buying and selling breakouts, it works on the SMA concept i.e., simple moving average which is and can be modified as per the user interface.

One of the major significance it shows is the current stock or asset has been sold to the extent or has been bought to the daily limits.

What Does Bollinger Bands Tell You?

There are a no. of indicators which help traders setup different algorithms as well as technical analysis there are a no. of rules for this setup to use under conditions and cannot be applied in every condition as different trading systems have different setups to work upon, this indicator is a highly trending one as the price of a certain stock or a candlestick chart is depicted through on what time frame the trader is trading and what kind of SMA is set up for that time frame.

Limitations of Bollinger Bands:

The Bollinger bands cannot work as a sole trading setup for most of the stocks index's entry and exit point it has limitations to a specific point which also suggest that it needs to be paired up with one or more indicators to confirm the trend direction to specify the trade is risk-taking or not certain other indicators which put up with the bands are the relative strength index (RSI) and the exponential moving average (EMA).

The traders use a different type of SMA simple moving average for different time frames to analyze the long or short term trend direction of the candlestick pattern which defines that the trade which is to be taken should be SHORTED i.e., taken on the pull(sell side) or LONG i.e., taken on the buy-side.

So as per my recent trade, we can see how the Bollinger bands helped into proper buying and selling with support and resistance lines and a trend of breakout.

Total profit as per trade:-

Entry at 33000$ at 25 LAC. Approx.

Hold the trade from 25th January to 27th of March

Exited at 48324$ at 36.61 LAC.

Total profits around 11.60 LAC.

Target Price

Investors look for magical returns in a short period of time but being realistic is essential to becoming a better trader. This is our personal observation a one can set their target prices on the basis of their judgments or even the amount of risk they are ready to take in a particular trade. But on the basis of our analysis target price should be a 3-5% return in a span of 10 days and if we get a 3-5% return in 10 days maybe we can square off our trade or if there is no bearish signal then even, we can hold our trade for long too and can bet on better returns.

And obviously, we will not always earn a 3-5% return but this should be our target. If we compare the returns with the bank, in India majority of banks give 3-6% of modest return in a year and here we can earn 3-5% in 10 days so there is a big difference in returns.

Strategy for Stop-Loss

Everyone talks about how to make a profit in the stock market or in other asset class but there are few who tells you how to limit losses. And by putting stop-loss in your order you convey a message to yourself that we are willing to lose only this much and making profit is as vital as making losses because mistakes or losses are the ones that teach us more about the market. Putting stop-loss in your trade is one of the most essential thing and disciplinary things in the trader's life. In our opinion, a trader who respects stop-loss and has the courage to book losses is the one who can make a profit in the near future also.

There are many ways, a trader can put stop-loss in their order.

1. Stop-loss will be equal to the median of the breakout candle. A breakout candle is the one that breaks the resistance or support level and gives us an indication while the crypto will be bullish or bearish.

Median = Opening + Closing ÷ 2

The candle which was formed on 16 March was breaking the resistance level of $2738 and if some has entered in that candle so our stop-loss will be at $2697.57 as we applied the formula of opening plus closing price divided by 2.

2. The second option is, to take the low of that candlestick in which we are making an entry and put it as stop-loss.

Based on the above graph let’s assume that we are taking an entry on 4 February, what we have to do is we have to take the low of that candle and put it as stop-loss. And the low of the candle is $37468.99, so it will be our stop loss.

3. Another way is putting a stop-loss with the help of indicators if we use the Relative Strength Index, we can put stop-loss as if the RSI line touches the level of 40 we will square off our trade.

And this we have discussed in Relative Strength Index how we can take an exit when the RSI reaches 40 or it went below 40.

Limitations of the Study

Technical Analysis is one of the areas of investing where everyone's opinions can contradict because everyone has their own philosophies, some use textbooks philosophies and some make their unique philosophies about the price movements over time.

In our opinion, trading is more psychological so everyone looks at trading differently the methodologies and indicators which we have used in this study may suit some and it may not suit some.

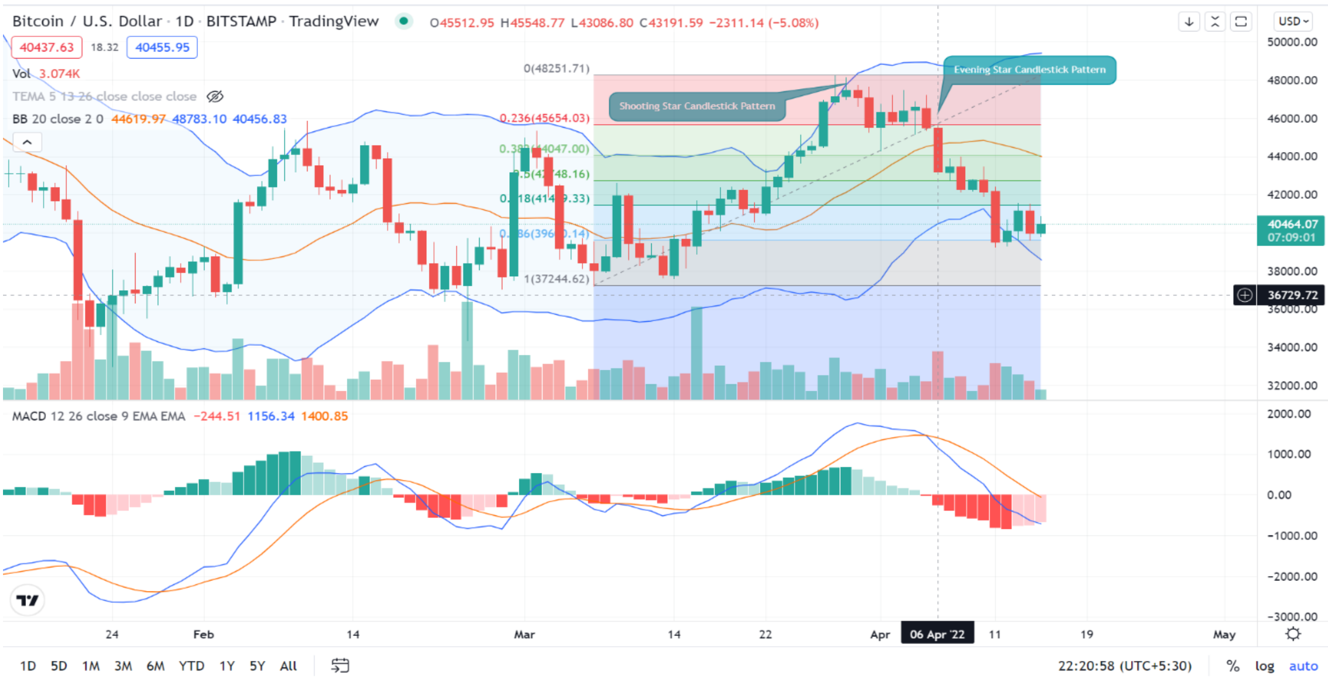
And the indicators and methods we have used in this study can contradict each other. Also, especially for the beginner, it is hard to understand what is the best indicator of technical analysis and how much importance should be given to which indicator.

Overall Analysis

We have analyzed the various tools of technical analysis separately and have seen their application in the cryptocurrency but now we will do the full analysis by combining all the tools which we have discussed till now. One thing we want to add here, for instance, we have 5 parameters of technical analysis so there is a high chance that every time 5 out 5 parameters will not give a ‘Buy’ or ‘Sell’ signal so what we can do is if someone is a conservative investor or a beginner can wait for confirmation of 4 parameters otherwise, he/she can ignore that trade at a particular point of time. But if someone is an aggressive investor he/she can trade when 3 out of 5 parameters are giving a particular signal. There are people who might trade on 1 or 2 parameters only and they earn a ton of money but as a trader, we feel much safer when there is more signal and the probability of making money is more when there are more confirmations on the positive side.

Look at the two pictures above and see how beautifully the technical analysis is predicting the future price movement of bitcoin, on 29 March 2022 the shooting star candlestick is formed which is a bearish candle, and subsequently, see the next candle giving the confirmation of the downtrend and look at MACD also how from 30 march 2022 it has started showing weakness and when on 5 April 2022 the evening star is formed at that particular MACD line cuts the Signal line from above which shows that market has become bearish and if we look at 5 DEMA it is also in a downtrend, after a few days it has cut the 13 DEMA and 26 DEMA line from above but which is too late obviously as we have discussed that Moving Averages are lagging indicator but look the significance of MACD in this particular case like it has shown the weakness so early which helps a trader to take an early call based on MACD.

And if we look at the second picture the RSI is also in a downtrend which is a good signal for bears according to what we have discussed so when the evening star is formed the RSI was in the range of 40-50 but one things here is a worth to note is RSI is in downtrend but we have discussed when it is 40 or below 40 then we should sell. So RSI is not giving a sell signal but surely other tools are giving a strong sell signal.



We have added the Bollinger band and Fibonacci retracement, Fibonacci the candle which is formed on 1 April 2022 has breakdown the support level that is forming at 23.6% and this is the opportunity where one can enter the market or one can wait for the next candle to be formed if someone wants to be sure of the trade but the next few candles took the support at that particular level but finally, the candle which is formed at 6 April 2022 has broken down the level of 38.2% and this is the signal that from now the price will go down barring any external factor incur. One thing we can learn in this too is that we have seen that the candle of 1 April 2022 has breakdown the level but after that market moves in the sideways trend which teaches an important lesson that market will not be like up or down always sometimes despite the strong signals a trader have to sit tight and if the market doesn't move in which a trader is hoping the market to move then it is wise that a trader respects their stop-loss and take an exit from the market.

Coming to Bollinger bands, it is self-explanatory that the candle of 6 April 2022 has broken 20 DEMA line support which shows that market is turning bearish only.

We have given the emphasis on candlesticks and we have said many times that over time everyone creates their analogies and every method can earn you money and even every method will have some flaws.

NOTE: We have used three pictures in the analysis because we want to explain it clearly.

Conclusion

There have been many different volumes of textbooks written on the Technical Analysis. Technical analysis is one of the fields where everyone has a different theory on what works and what does not work. Backtesting is looking back at several years' worth of charts to see how a particular cryptocurrency reacts. Different securities do different things, so be sure to do the homework first. The main points to remember about technical analysis are: It is a method of evaluating securities by analyzing statistics which is generated by market activity, past prices, and volumes.

Over a straight-line graph, the advantage of using Candlesticks is that it shows the low, high, close, and open for each particular day. And every pattern of a candlestick has its own meaning and an astute person can take trades on the basis of all those patterns. We have used the major 6 patterns of candlesticks which is best for reversal and we have proved in this study how those patterns effectively work in the analysis of bitcoin and why the confirmation candle is important for the entry and when we can take the exit on the basis of candlesticks. Like candlestick pattern like a morning star is so powerful if someone wants to play for uptrend and one thing we have to understand is that every day is not sunny so these patterns which we have discussed will not form every day, a person in trading needs patience for the entry and the exit and if someone takes decision in a hurry the chances of incurring loses are higher. And all of those who like to take trades based on candlesticks will require a lot of patience. Volumes are one other area which shows how we can use it with candlesticks pattern and for the swing trading how we can interpret the behavior of the buyers and sellers by comparing the particular day volume with the previous 5 days volume. And big volume with a breakout candle is always a great sign for entering the market because it shows that traders are confident that the market will go up so the chances of earning profit during this are higher. If we talk about entry and exit the importance of Support and Resistance becomes vital.

Support and Resistance levels are the price levels at which movement should stop and reverse direction. This support/ Resistance is as levels that act as a floor or a ceiling to future price movements. We have shown in this study how we can enter and exit by the usage of support and resistance levels. And even support and Resistance play a crucial role in setting our stop and target price. A breakout candle that broke the resistance level and its low can be used as a stop loss. When someone is entering the market on a minor resistance zone and can set a major resistance zone as a target price. And there are other methods like the median of the breakout candle to set the stop-loss.

Another thing that we have discussed is Moving Averages, which is one of the most basic and easy ways of using technical analysis indicators, which shows the average value of a security's price over a period of time. In moving averages, we have taken 5DEMA, 13 DEMA, and 26 DEMA. The reason behind all of these particular ranges have been discussed and, in our opinion, these are the best range for swing trading. But one of the limitations which we have seen of moving averages is that they are the lagging indicator so they give signals a bit late than any other indicator which can result in some profits which we can miss. But in totality, it is a good indicator and if someone is a passive investor or starting their career in investing and they want to learn rather than earn so in the early stages they can use moving averages but a person who wants to be ahead can miss out the moving averages and can follow other indicators. Coming to another indicator, we have talked about Moving Averages conversion diversion. MACD is one of the leading indicators in technical analysis and it shows the strength or weakness of the security first and then the price reacts according to it. A simple crossover strategy is used in MACD when the MACD line crosses the signal from below it is "Buy Call' and if it's from above it generates the "Sell Call". Not only crossover strategy but we can trade on the basis of MACD Divergence like a strong MACD bullish divergence occurs when the price makes the downtrend but the MACD line is making uptrend and vice-versa for the bearish divergence. Another indicator that we have discussed is the Relative Strength Index. The Relative Strength Index is an indicator of momentum that is used in the technical analysis which measures the magnitude of the recent prices changes to evaluate oversold conditions in the price of a stock or the other assets. RSI has a range from 0 to 100. In RSI we have not used the traditional method which is given by the founder but we have used another method which we can say a 'new way'. We have taken the levels of 60 and 40. When RSI is above 60 it generates a "Buy Call' and if it's below 40 then it generates a "Sell call". There is our one piece of advice here don't enter or exit at exactly 60 and 40 for the entry let's wait for 61 or 62 and apply same technique while exiting also. The whole sense of taking these levels as there is a high chance of security doing good when it is in momentum rather than when it is down. So, if RSI is 60 or above 60 it means that particular security is in a good momentum and we want to invest in that momentum so that we can make money.

The other thing which we have seen in this study was Fibonacci retracement. The importance of Fibonacci numbers is very well defined by many authors and how our lives evolve around Fibonacci numbers we have shown in this study how Fibonacci numbers play a crucial role in technical analysis and Fibonacci retracement can be drawn by the joining the lowest point on the screen to the highest point on the screen. The common levels in the chart are 23.6%,38.2%,50% and 61.8% and these are levels from which the security can retrace. And these levels also act as a support and resistance for the price and we can take a trade based on that. The other thing which we have analyzed in this study was the Bollinger band, in Bollinger bands 95% of the time the price will remain in the band, and in that 5%, our earning chance arises. The 20 DEMA line in the Bollinger band act as a support if the current price is above the 20 DEMA line and it acts as support if it's below 20 DEMA. For the trading, we have to wait for the breakout. The width of the band defines volatility if the width is less it is less volatile and if the width is more then it is highly volatile. We can also trade when Bollinger band squeeze is formed. BB squeeze occurs when there is very low volatility and if this continues for more than 1 month and if the current candle breaks the upper BB then it is a "Buy Call". The things which we have analyzed have their own importance and everything in technical is a bit different to each and even same to each other. With this study in our humble opinion, we can say that technical effective work on cryptocurrency.

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Can the Market of Cryptocurrency Be Followed with the Technical Analysis?

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Abstract: This paper focuses on the role of technical analysis in cryptocurrency and whether cryptocurrency can be followed with technical analysis or not. During this study, we have used the most established technical tools and indicators like the Candlestick pattern, volumes, trends, the Moving Average, Moving Average Convergence Divergence, the Relative Strength Index, Bollinger Bands, Fibonacci Retracement, etc. By analyzing Bitcoin charts, the results indicate that the indicators can be used to generate a significantly positive return. It is found that cryptocurrency can be followed with technical analysis like equity market and forex market. We have used charts that explain how Bitcoin can be traded through technical analysis which is the most hyped-up topic for today's generation.
Keywords: Technical Analysis, Cryptocurrency, bearish, bullish, traders, candlestick pattens, technical indicators, securities, Moving Average Convergence Divergence (MACD), Relative Strength Index (RSI), Bollinger Bands and, trends.

I. INTRODUCTION

The last century has witnessed the remarkable growth of the financial sector and financial instruments. Financial systems are actively developing, transforming, and adjusting to certain economic and technological necessities. During this tenure, we have seen the growth of assets class like equities, debt securities, gold, private equity, real estate, hedge funds, etc but last 10 years we have majorly seen the growth of digital assets and now when we talk about digital asset one name comes in everyone mind is Cryptocurrency. Cryptocurrency is a revolution for the financial sector and for the investors but it seems like it is the most abused investment class because there are clouds of uncertainty which has formed over time. Many interpret that it is the riskiest type of investment class because of its volatility and retrospectively it has proved that it is highly volatile, look at the bitcoin upsurge and downside in the span of 1 year which raises the eyebrows of investors and governments. That's why every government has its own opinion on cryptocurrency while some countries look at crypto as an opportunity while some are not fascinated by the idea of cryptocurrency. But there is the catalyst of cryptocurrency who believes it is not that risky for the investment and any astute individual who knows technical analysis can invest in crypto & can make fortune out of it. According to tomorrowmakers.com, there are 15,000+ cryptocurrencies and among them, Bitcoin and Ethereum are the two biggest cryptos by Market Capitalisation. And bitcoin is the one that has changed the scenario of crypto as it is widely regarded as the first modern cryptocurrency. In late 2012, WordPress became the first important service provider to accept Bitcoin. Others, which include online electronics retailer Newegg.Com, Expedia, Microsoft, and Tesla followed. Countless traders now view the cryptocurrency as a valid payment method. But the fun fact about Bitcoin is that the total amount of bitcoin is limited in the world, you can't mine on your wish and that's why it has a big impact on the price because the supply is constant here but whenever demand increases, the prices automatically increase because of supply and demand gap. Bitcoin is considered a limited resource like gold or oil. For the mining of bitcoin, an individual needs high technology-based machinery which is too expensive for normal people so there are not many who can mine the bitcoin. According to Sunbird, China is the largest farmer of bitcoin, they mine 3 % of all Bitcoins and mine 750 bitcoins every month. This study fills the gap on whether the cryptocurrency can be analyzed by technical analysis and can give us an adequate signal and can we take trades based on those signals or not. This study is best suited for short-term investing particularly for 1 week to 1 month period, and the methods and tools which will be used in this study will be best suited for short term trading, and an individual who will read and understand this study can apply the methodology and tools in stock trading also.

II. CRYPTOCURRENCY

A cryptocurrency is a digital asset that can circulate without the need for a central monetary authority such as a government or bank. Instead, cryptocurrencies are created using Cryptographic techniques that enable people to buy sell, or trade them securely. Bitcoin and most other cryptocurrencies are supported by a technology known as the blockchain, which maintains a tamper-resistant record of transactions and keeps track of who owns what. The creation of blockchains addressed a problem faced by previous efforts to create purely digital currencies: Preventing people from making copies of their holdings and attempting to spend them twice.

The units of cryptocurrencies are referred to as coins or tokens. Some are used as units of exchange for goods and services, others are stores of value, and some are mostly designed to help run computer networks that carry out more complex financial transactions.
Cryptocurrencies are created through a process called mining, which is used in Bitcoin. Mining can be an energy-intensive process in which computers solve complex puzzles to verify the authenticity of transitions on the network. As a reward, the owners of those computers can receive newly created cryptocurrency. Other cryptocurrencies use different methods to create and distribute tokens, and many have a significantly lighter environmental impact.
A cryptocurrency blockchain is similar to a bank's balance sheet or ledge. Each currency has its blockchain, which is an ongoing, constantly re-verified record of every single transaction ever made using that currency.
Cryptocurrency does not exist in physical form (like paper money) and it's typically not issued by a central authority. Cryptocurrencies typically use decentralized control as opposed to a central bank digital currency (CBDC) When a cryptocurrency is minted or created before insurance or issued by a single issuer, it is generally considered centralized. When implemented with decentralized control each cryptocurrency works through distributed ledger technology, typically a blockchain, that serves as a public financial transitions database.
In today's world, cryptocurrencies exist only online. Cryptocurrencies use encryption to authenticate and protect transactions hence their name. There are currently over a thousand different cryptocurrencies in the world.

III. TECHNICAL ANALYSIS

Technical analysis is the analysis of the price and volume of the assets class. With the help of technical analysis, an individual can make a future prediction based on past data and that data is presented in the form of charts like Bar charts, Candlesticks charts, line charts, etc. It is one of the tools which is used by traders frequently for short-term investment purposes. Through this not only short-term investment decisions can be made but also long-term investment decisions. There are three principles of technical analysis, first one is that all the available information in the market is already contained in the stock prices, the second is that stock price generally moves in trend and the last one is that history repeats itself.
The concept of technical analysis is so special because like in fundamental analysis an investor needs to understand the economy, industry, and company which requires lots of commerce background backing, and the people who choose the other core program struggle to understand the fundamental analysis but technical analysis is much easier to grasp even for the person who has zero knowledge related to finance and commerce.

IV. SIGNIFICANCE OF THE STUDY

Several people in the world think cryptocurrency is not predictable and where the price is like drunk man nobody knows what will be the next step when the price will go up or down. During this study our main focus was on, is it possible to follow Cryptocurrency with technical analysis like the equity market, forex market, etc. Because in all of these technical analyses do wonder. This study shows the idealization of how cryptocurrencies use the technical analysis also how they can be used to accumulate money and earn a huge rate of interest on investments made over time.
The study demonstrates how Bitcoin can be traded through basic methods and give out huge returns as all the information is available on the internet to trade from platforms like Trading view, Wazir x, etc.
So, the significance of our study becomes bigger because we didn't just show the analysis of whether it works on cryptocurrencies like Bitcoin and Ethereum or not but we have explained the all concepts very well and efficiently. A person who has zero knowledge about technical analysis or even about cryptocurrency will get a fair idea after reading this thoroughly. We have covered all the main aspects of technical analysis in this study which will help the investor or any beginner to invest in cryptocurrencies or even in the stock market, forex market, etc. Through this study, a person will be able to know about the concepts like Support and Resistance levels and how someone can make an entry based on that, about the volumes and how we can analyze the volumes, and how we can implement our trading style, about the trends and how any trend is formed and what are signals of a trend reversal, about some major candlesticks pattern, about MACD and how it gives signals to take a buy call and sell call based on it, about Moving Averages which is a lagging indicator and how we can take trades and what are the strategies we use in that, about Relative Strength Index, Bollinger Bands. So we have covered all of these and we have taken real-life chart examples and how we can implement those techniques in real-time based on how certain patterns should be formed to take an entry and exit. All of these things were related to how we can make profits but we have not forgotten in this study how we can limit our losses while investing in cryptocurrency and we have given viable options for putting a stop-loss and also how someone can set price targets and how much they should aim for in particular time frame.

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V. THE OBJECTIVE OF THE STUDY

The objective of the study is to determine whether we can analyze the cryptocurrency with the help of technical analysis or not and if we can analyze so how any individual can take trades based on technical analysis and what should be the ideal methodology to follow during the technical analysis for the swing trading.

VI. RESEARCH METHODOLOGY

A. Research Design

In this study, we have done quantitative research and analytical research because our main focus was on proving whether we can analyze cryptocurrency with the help of technical analysis or not. So, in order to do that, we have taken the technical charts from sites like Trading View and Investing.com, and with the help of those charts we have proved technical analogies and we have analyzed the technical charts, and explained how indicators or technical analysis tools affect the price and decision making of when to enter and exit and conclusion have been made on the basis of it.

B. Source of Data

This research is based on secondary data as we used the data which already existed but with the help of the data, we have analyzed the cryptocurrencies like Bitcoin and Ethereum and made specific judgments on them and we conclude the data basis on the facts and methodologies.

VII. TOOLS USED IN THIS STUDY

A. Trends

Trends indicate the direction in which the price of the security will move. There a famous saying related to trends is “Trend is your friend until the end when it bends”. In my opinion, trends and volumes are the most essential thing in technical analysis because it gives the traders a rough idea about the behavior of the asset.

Trends are a combination of up moves and down moves. There are three types of trends.

1) *Uptrend:* A uptrend is formed when higher highs and higher lows are formed. Uptrend is a great friend of bulls. Bulls dominate the market in uptrend they put buying pressure more and more so that the price of the asset will rise and the asset will make newer highs. The best time to buy an asset in an uptrend is when the price of an asset pulls back. There is one myth in the market that buy at low and sell at high but we don’t believe in that statement because we firmly believe that if the asset is showing no signs of weakness why to sell at high and let the price of security rise more and this is our thumb rule that “NEVER SELL IN AN UPTREND”. Yes, if it’s giving reversal signals then sell the asset and, in an uptrend, the reversal signal will be formed when the Lower high is formed and then the Lower low is formed.

In the above chart, down arrows indicate the higher highs, and up arrows indicate the higher lows.

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2) *Downtrend:* A downtrend is formed when lower highs and lower lows are formed. The downtrend is well-liked by bears who love to trade when the market is down. If anyone wants to short the position then first wait for the impulse down and then wait for the correction and during the correction time, enter the market. One of the thumb rules of downtrend is "Never Buy in Downtrend". There is a famous saying related to downtrend is "Never catch a falling knife". The end of a downtrend can be spotted when the asset makes higher highs after the lower highs.

3) *Sideways Trend:* Sideways trends are formed when highs and lows are in the same range. A sideways trend is the bread and butter of intraday traders. Because in sideways trend they can bet a small price point which they want to achieve. Short-term investors in sideways trends should apply a wait and watch strategy and should wait for the breakout.

B. Volumes

A Volume measures the number of trades is taken place in a particular time frame. Volumes can indicate market strength, as rising markets on increasing volumes are typically viewed as strong and healthy. When prices of the increasing volumes fall, then the trend is gathering strength to the downside. Trading volume is a technical indicator because it represents the overall activity of a security or a market. Investors often use the trading volume to confirm the existence, or a continuation, of a trend or trend reversal. Essentially, trading volume can legitimize a security's price action, which can then aid an investor in their decision to either sell or purchase that security. Trading volume can help an investor to identify momentum in security and confirm a trend. If the trading volume increases, then the prices generally move in the same direction. That is, if security is continuing higher in an uptrend, the volume of the security should also increase and vice versa.

For example, suppose a particular cryptocurrency has increased its price by 10% over the past month. And if an investor is interested in that cryptocurrency and wants to purchase certain units. But if the investor is not confident that the cryptocurrency will continue in this uptrend and is worried that the trend may reverse. Trading volume can also give a signal when an investor should take profits and sell a security due to low activity. If there is no relationship between the trading volume and the price of a security, then this signals shows weakness in the current trend and a possible reversal is on cards.

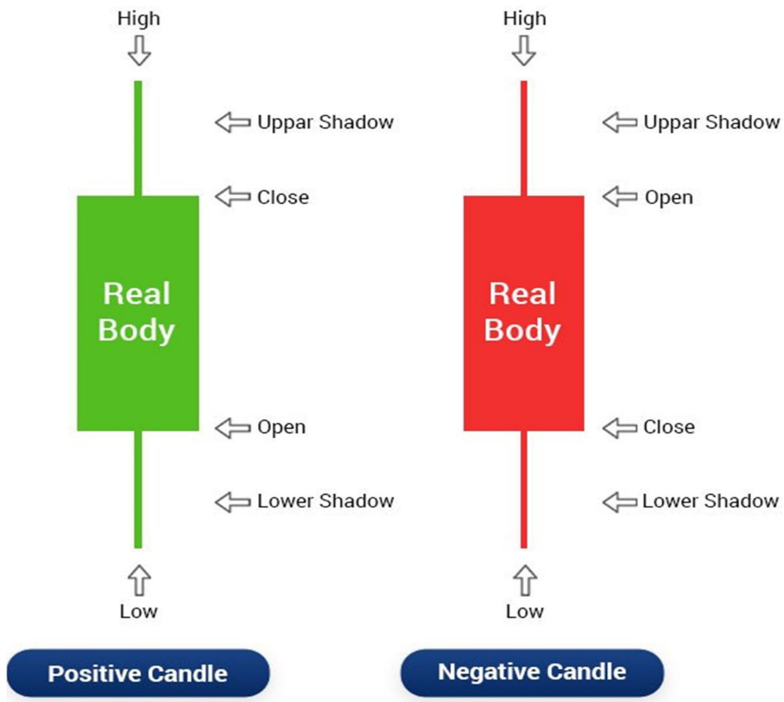
For the analysis of volumes, compare it with the last 5 volume bars. This methodology excellently works in swing trading when we take trades based on particular breakouts. And one thing worth remembering in volumes is that a breakout with increased volumes is a better confirmation of a trend reversal.

C. Analysis Of How Volumes Can Be Used To Know The Behavior Of Traders

After the interpretation of the above graph, we can see on 24 February 2022 a big green volume bar is formed it means so many trades have occurred on that particular day and it is supported by the big green candle which is a good scenario if we see the candlestick the closing price is higher than the opening price which indicates that the bulls were in control even bears created the selling pressure and reaches the lowest price of February month but the bulls came alive and they have won the battle against the bears which indicates that in coming time the market can be bullish. But one thing we have analyzed during this study is that based only on volume one can't take trades because sometimes the stock operator who can buy in bulk can influence the prices by entering and exiting at different times and can inflate the prices. So analysing prices with volumes is always a sign of astute person in trading.

VIII. CANDLESTICKS

To analyze the fluctuations of the Bitcoin., We have used Candlestick's pattern to gauge the highs and lows of the Bitcoin. A candlestick is a manner of showing information about an asset's price movement. Candlestick charts are one of the most famous components of technical evaluation, permitting investors to interpret price movements. And candlesticks patterns are used in technical analysis by the traders or investors. This basically helps to track day-to-day highs and lows, open and close price of the asset class.



1) *The Wick:* The wick shows the high and low prices of the day. This means higher the wick higher the price and lowers the wick means lower the price.
2) *The Body:* The body of the candlesticks shows the open and close price of the share.
3) *Green Candlestick:* Green Candlestick shows that market is bullish. Simply, Green Candlestick means the closing price of the share is higher than the opening price.
4) *Red Candlestick:* Red Candlestick shows that the market is bearish, Simply, Red Candlestick means that there is a price decrease in the share.

There are many types of candlesticks used by the traders and every candlestick has its formation and meaning but, in this study, we will analyse the most popular candlesticks only and how we can trade based on that we will understand that also.

a) *Bullish Engulfing Pattern (Bullish Pattern):* This is a two-candlestick pattern where the second candle (bullish candle) completely engulfs/overlaps the previous day's candle. This type of candle is more powerful when it is made after the bearish trend and after the bearish trend if this candle is made up this shows a bullish trend is coming.

Graph Of Bullish Engulfing Pattern

As we can see in the above picture that on 21 July 2021, the bullish engulfing pattern is formed and after that, we can see a big uptrend in the following days. This trend is most suitable for when someone wants to be bullish and this graph has shown clearly how uptrend has shown by the bitcoin after the bullish engulfing pattern has formed.

b) Bearish Engulfing Pattern (Bearish Pattern) – This is the reverse of the Bullish Engulfing Pattern where the second candle is a big bearish candle that engulfs the first candle which is a bullish candle. It is powerful when it is formed at the bottom of the uptrend.

Graph Of Bearish Engulfing Pattern

On 15 November 2021, the bearish engulfing pattern is formed at the end of an uptrend and subsequently, we can see that the downtrend has formed this creates the opportunity for short selling and even when the bearish engulfing pattern was formed, we can also take a sell call from that point because it shows that now the bullish trend is over and now the bearish trend is coming.

c) *Morning Star Candlestick (Bullish Pattern):* It is a bullish three candlestick pattern formed at the bottom of a downtrend. It is one of the most powerful patterns which shows bullishness.

1st Candle – Big Bearish Candle

2nd Candle- Doji Candle (Candle which is indecisive, it shows the condition where both bulls and bears are fighting but neither wins the fight).

3rd Candle- Big bullish candle which closes near the high of the day.

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Graph Of Morning Star Candlestick Pattern

On 19 August 2021, the Morning star pattern is formed and it is confirmed by another big bullish candle where we can take an entry, and if someone has taken the entry on 20 august, they might have purchased 1bitcoin at around $47,000 and in the span of 20 days only they can make $5000 on the basis of this candlestick pattern only. This shows how powerful this pattern is. But the thing is we have to wait for confirmation if someone is a passive investor and if someone is an aggressive investor, he/she can enter on 19 august also by seeing analyzing the intraday charts which are minutes and hourly charts but, in this study, we are talking about swing trading so we will stick to it only here.

And one thing you can take as a note is Doji candle doesn't matter in this pattern it can be bullish or bearish what matter is the color of the third candle which should be a bullish candle and also the confirmation candle which is the 4th candle where an individual will take an entry.

d) *Evening Star Candlestick (Bearish Pattern):* It is formed when a green candle is followed by a Doji candle which is then followed by a big bearish candle. This will be most powerful when it is formed at the end of an uptrend.

Graph Of Evening Star Candlestick Pattern

See how on 28 December 2021, the evening star candlestick pattern is formed and bitcoin was already bearish for the last 1 month but even if you wait for the evening star confirmation even then you can make a profit by shorting in the short-term.

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e) *Hammer:* It is formed when open, high, and close are roughly the same price. The shadow should be twice more than the length of the body. Hammer is most effective when it occurs at the bottom of the downward trend and is considered a bullish reversal trend. Confirmation needs to be taken (followed by a big bullish candle) should be the immediate next candle.

As we can see on 3 February 2022, the hammer pattern is formed and it is such a beautiful example see how it is confirmed by big green candle and how much in next 6 days the bitcoin has gained. Hammer pattern can give many false signals too like hammer can be formed but after that sometimes-what trader make mistake is they see the hammer and they enter the market but the vital thing is that the confirmation candle and which requires patience because 1000 times it will happen that pattern will be formed but there will be no confirmation so in that scenario there is a high chance we can incur losses.
Same as hammer there is another pattern called inverted hammer. As name suggest it is inverted in shape. Its low, close, open are roughly same.
Hammer and Inverted Hammer color doesn't matter but green candle is always considered more positive.

f) *Hanging Man:* It is same as hammer but it is formed when there is a uptrend unlike hammer which is formed at the bottom of downtrend. Hanging Man is sign of Bearish Reversal and it get confirmation when it is followed by bearish Red Candle.

Graph Of Hanging Man Candlestick Pattern

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This is the example of Ethereum and looks at how the hanging man is formed on 16 February 2022, and there is a sharp decline in the value of Ethereum what's vital here is the confirmation candle which is a big bearish candle that is formed on 17 February.
There is another candle called Shooting star which is the same as the Inverted hammer shows Bearish Reversal. Powerful when Formed at the top of an uptrend, should be followed by Bearish Candle for Bearish trend.
These are the six major patterns of candlesticks that we have analysed in this study and there are many more patterns that a trader can use like Bullish and Bearish Harami candle, Bullish and Bearish Kicker and etc but We have put emphasis on the top 6 candlesticks patterns which are well easy to analyse according to our opinion.
But the question is whether the candlesticks are enough to make a judgment to enter the market? My answer will be NO as we have to add other indicators also to make a firm judgment whether the cryptocurrency will be bullish or bearish in the coming trend. And we have to understand one thing is that daily such patterns will not be formed, as much we have learned from the stock market or by listening to all traders and investors and reading books that "Patience is the key in investing" if we are disciplined enough to follow strategies and wait for confirmation one day or another, we will make a profit. So having the right mentality is crucial.
One thing which is worth remembering is that these patterns which we have analyzed will not work 100 out of 100 times because there are so many things that affect cryptocurrency prices so there might be the failure of patterns as the crypto market is also affected by external forces.

IX. SUPPORT AND RESISTANCE LEVELS

The Concept of trading level support and resistance are undoubtedly two of the highest attributes of technical analysis. As part of analyzing charts patterns, these terms are used by traders to refer to price levels on charts that tend to act as barriers, preventing the price of a cryptocurrency from getting pushed in a particular direction.
At first, the explanation and idea behind identifying these levels seem easy, but as we find out, support and resistance can come in various forms, and the concept is more difficult to master than it first appears.
Support is a price level where a downtrend can be expected to pause due to a concentration of demand or buying interest, As the price of assets or securities drops, demand for the units of cryptocurrency increases, thus forming the support line.
Meanwhile, resistance zones arise due to selling interest when prices have increased.
Once an area or "Zone" of support or resistance has been identified those prices can serve as potential entry or exit points because, as a price reaches a point of support or resistance, it will do one of two things-bounce back away from the support or resistance level or violate the price level and continues in its direction-until it hits next support or resistance level.
The timing of some trades is based on the belief that support and resistance zones will not be broken. Whether the price is halted by the support or resistance level, or it breaks through traders can "bet" on the direction and can quickly determine if they are correct. If the price moves in the wrong direction, the positions can be closed at a small loss. If the price moves in the right direction, however, the move may be substantial.

A. *Graphical Representation Of Support And Resistance Line*

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The red line shows the recent resistance to a price barrier in the chart analysis segmentation. Which stands at a point of 48110$ currently 36 lakhs 61 thousand in Indian rupees. This line can be formed by joining major candles' top wick which is the basic to form a support or resistance trend line.

The support of Bitcoin lies at 32960$ our buying point which is currently the lowest in the chart of Bitcoin so there stands the support line with blue color which also signifies that Bitcoin rose up after this point two times in the month of January. So, therefore giving it the condition to call it at support on 25 lakhs i.e., 32000 $ us dollars.

The recent resistance shows the major formation of candles highlighted with a green color line in the same zone for certain days which also signifies that this price level of 45000$ is a hard one to break i.e.,34 lakhs in Indian rupees.

X. INDICATORS

Indicators are mathematical tools that can be used to anticipate trends, volatility, and price of various securities.

XI. MOVING AVERAGES

It is one of the most famous indicators used by technical analysts. Moving Average is an effective indicator; however, it is treated as a lagging indicator means it generates “Buy and Sell” calls a bit late. In moving averages, we take the average of the most recent closing prices of the n time period.

In Moving averages, we will use Exponential Moving Averages which apply weighting factors that decrease exponentially.

Here, we will take 5,13, and 26-days EMA. And here is the reason below for choosing this range.

1) 5 days moving average is like analyzing 1 week’s data.
2) 13 days moving average is like analyzing 1 fortnight’s data.
3) 26 days moving average is like analyzing 1 month’s data.

A. Calculation of Exponential Moving Averages

Suppose the Day 1 price of bitcoin is 95, day 2 price is 110, and day 3 price is 100.

As day 3 is the recent day so we will assign more weightage to day 3, and subsequently, the weightage will decrease day by day.

So, the weightage of day 3 is 3, day 2 is 2, and day1 weightage is 1. Now multiply the respective prices with their respective day weightage.

Day 1 – 95*1 = 95

Day 2 – 110*2 = 220

Day 3 – 100*3 = 300

Now we will add these numbers 95+220+300 and the total will be 615. Now add the total weightage of numbers which we have assigned to days prices.

1+2+3 = 6

Now divide the 615 by 6 and the outcome will be 535.84. So this is how we can calculate 5 DEMA, 13 DEMA, and 26 DEMA.

You can set your own ranges by back testing and every trader has their own methodology and techniques they use. Like there are traders who use 55 DEMA (Day Exponential Moving Average), 100 DEMA, and 200 DEMA.

I will use the crossover technique in moving averages. Basically, in the crossover technique when a particular DEMA cuts the other DEMA from below or above it gives us a “BUY” or “Sell” signal.

Buy strategy for moving averages:

1. When 5 DEMA cuts the 13 DEMA from below, it’s an anticipatory buy.
2. When 5 DEMA Cut the 26 DEMA from below, it’s a confirmatory buy.

Sell strategy for moving averages:

1. When 5 Dema cuts the 13 DEMA from above, it’s an anticipatory sell.
2. When 5 DEMA cuts the 26 DEMA from above, it’s a confirmatory buy.

And if 5 DEMA Cuts the 13 & 26 DEMA from below in a single then it is a powerful sign for bulls and vice-versa.

In the majority of cases, the 5 days moving average line will close the current market price. And if the 5DEMA line is above the 13 and 26 DEMA line it shows strength because it means in the last 5 days the average moving price is more than the 13- and 26-days exponential moving average.

Graphical Representation Of Day Exponential Moving Averages

We can see in this picture that on 16 March 2022, the red line which is the 5 DEMA line cut the Green and Blackline which is 13 and 26 DEMA line from below, and after that, it is visible how it has given a confirmatory 'Buy' call in a single day because 5 DEMA cuts the 13 and 26 DEMA on 16 March only and after that, we can see the bitcoin has become bullish. Also, one thing is worth noting here is that the expansion between lines gets bigger day by day which shows how recent prices which are 5 DEMA (red line) outperform the 26 DEMA (Blackline) which means in the short term all traders have shown bullishness in Bitcoin.

Also, we have analyzed a candlesticks pattern and on 14 March 2022, the bullish engulfing pattern has been formed look at how bitcoin has become a rocket, and with the candlesticks already giving signal on 14 March and then on 16 March it has been confirmed by moving averages also. Look at how powerful it is and how interesting it is the thing we have analyzed in candlesticks and now when we are using it simultaneously with moving averages it was surely giving us a buy call signal on 16 March 2022.

Now see this chart and on 17 February 2022, the 5 DEMA cuts 13 and 26 DEMA from above, and subsequently, we can see that market has also become bearish. And if we look closely the hanging man is also formed at the end of the uptrend which is also giving reversal signals.

This is how moving averages work, even an individual can create their philosophy regarding the moving averages many investors use Fibonacci numbers for moving averages length, and also some people use EMA as support and resistance level. But we like to moving averages in a crossover technique because it has given us best results over the time.

XII. MOVING AVERAGE CONVERGENCE DIVERGENCE (MACD)

This is a fantastic leading indicator. MACD says price moves afterward but first signs of weakness and strengths are shown.
If we take a cricket example, sometimes what happens is a batsman starts missing the balls first and it indicates to the bowler that batsmen is not in form and it is the indicator that he might get out early today. So, it is a sign of weakness. Similarly, any batsman came and hit a four on his first ball which shows he is in the form today so it shows the signal of strength.
Ideally, we see weakness first and then the price falls.
Similarly, we see strength first and then price rises.

A. Major Components of MACD

MACD Line – Generally a blue line (Fast Line)
Signal Line – Generally Orange Line (Slow Line)
Histogram- bars indicate the difference between MACD line and Signal Line)

B. Calculation of MACD Line and Signal Line

MACD is calculated by subtracting 26 days' exponential moving average from the 12 days' Exponential moving average. And how we can calculate Days' exponential moving average is already discussed in the moving averages. By subtracting 26 DEMA from 12 DEMA we get MACD Line. We got various amounts by subtracting the EMAs. MACD line is formed by joining all these dots.
Now after getting the MACD line, we can easily calculate the signal line. The signal line is calculated as 9 Days Exponential Moving Average of MACD.

C. Strategy for MACD

If MACD > 0 = Strength
If MACD < 0 = Weakness
If the MACD line cuts the signal line from above it generates the "Sell signal" and if the MACD line cuts the signal line from below it generates the "Buy Signal".

D. How to Trade with the use of MACD Divergence

Many buyers in the cryptocurrency market like to trade based on trends. Price trends and MACD trends give various signals of bullish and bearish reversal.
A strong bullish MACD divergence occurs when the price of cryptocurrency is making a lower low which is a downtrend but MACD is making a higher high which is an uptrend. This shows that the selling pressure is decreasing in the market and more buyers are entering the market and they are ready to push the prices which indicates a reversal.
And bearish MACD divergence occurs when the price of cryptocurrency is making a higher high which is an uptrend but MACD is making a lower low which is a downtrend. This shows that the buying pressure is decreasing in the market and sellers are entering the market and they are ready for heavy selling which indicates a bearish reversal.

Graph of MACD

On 5 April 2022, the MACD line which is the blue line cuts the orange line (Signal line) from above it means that bears are getting stronger and the bulls were getting weak and the same thing was shown by the candlesticks as they showed bearish nature recently and even 5 DEMA line is cutting the 13 DEMA line from above which is also giving us signals of anticipatory sell. And if we look at this chart closely, we can see that the MACD indicator was started showing weakness a 5 days ago, and one thing worth noting that the same day the histogram showed weakness the same day big bearish candle was formed too, so there were clear signals that if nothing unexpected happens Bitcoin will become a bearish incoming trend and it really happens when even MACD gave sell signal as a leading indicator.

Now, if we analyze the 15 March 2022 chart, we can see that a hammer candlestick pattern is formed and it is followed by a big bullish candle which is the perfect scenario for the hammer candlestick pattern, simultaneously if we look at the MACD indicator chart on 15 March the there is a crossover, the MACD line cuts the signal line from below which shows the strength of bulls after that we can see that how prices of bitcoin have risen. So this is how we can make decisions based on the MACD signals.

XIII. RELATIVE STRENGTH INDEX

The relative Strength Index is one of the most popular indicators among traders. Some traders believe that if you know the Relative Strength index that means you know technical analysis and they do take trades only based on the Relative Strength Index.

The Relative Strength Index is an indicator of momentum that is used in the technical analysis which measures the magnitude of the recent prices changes to evaluate oversold conditions in the price of a stock or the other assets. The Relative strength index has a reading from 0 to 100 and it is displayed as an oscillator a line graph that moves between two extremes. The indicator was originally developed by J. Welles Wilder Jr. and he introduced this indicator in his seminal 1978 book, which was named “New Concepts in Technical Trading Systems”.

RSI is computed in two parts.

The Formula for the RSI is mentioned below:

Step-1; 100- [1+average loss Average gain 100]

Average Gain or Average loss is used in the calculation as the average percentage of gain or loss during a long back period. In this, the positive value is used by the formula for the average loss. In average gain periods with price, losses are counted as 0 in the calculations. And in the case of average losses the periods are counted as 0 in the calculations. And to calculate the initial RSI value the standard is to use 14 periods.

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J. Welles Wilder's theory was that when the Relative Strength Index (RSI) is greater than 30 that generates a ‘Buy Call’ because he believes when RSI is 30 or less that there is an oversold position in the market so which means there are more seller than buyers and the security will be cheap at that time. And if it’s 70 or greater than 70 it generates a ‘Sell Call’ because it is an overbought position.
But here we have taken a different range for the Relative Strength Index and as we gave an example of cricket in MACD same rules we apply here as we do trades based on momentum, like if batsmen are making runs he has a greater chance that he will score runs again so we are kind of applying this theory in Relative Strength Index. When the RSI will be 60 or greater than 60 it will generate a ‘Buy Call’ because it is in an uptrend and this also indicates that the security is doing great that’s why its RSI has reached 60. So, when RSI will be 60 or above 60, we will buy it. If RSI takes multiple (2-3 times) support at 60. Then it is bullish.
On the other hand, If RSI is 40 or less than 40 means it is a downtrend and it generates a ‘Sell call’ If RSI is facing resistance at 40 that means the security is bearish. And if RSI is between 40 &60 this indicates a sideways trend.

Graph Of Rsi When Rsi Is Above 60

In the above graph on 24 March 2022, the RSI line crosses 60 and if we look at the candlesticks simultaneously Evening Star Candlestick Pattern is formed after crossing 60 see how the prices of Bitcoin became a rocket and in the span of 5 days if someone has taken this trade if that investor had 1 bitcoin, they might end up making $5000-6000 which is an insane amount of profit in such short period. And even if someone wants to hold their position then after that RSI takes the support of 60 two times which is showing bullishness but when it went below 60 a someone who has made enough profit can square or we can hold our position but, in this case, first the shooting star is formed and even evening star is also formed just after 2 days so it is better to book profit at that time. And one can also analyze this position by MACD what it is showing if MACD is also giving signal Sell then we must book our profit in this situation.

Graph Of RSI When RSI Is Below 40

If we analyze this graph on 12 May 2021 the RSI line went below 40 and after that see how the price of bitcoin dipped. And if someone wants to short position on bitcoin it is the best time to do so because if we analyze the candlesticks also it is a big red candle which is a positive sign for those who want to short and it’s a bad signal for those who are holding this stock so now, they have to square off their position.
So this is how we can analyze the Relative Strength index, we can follow the traditional or the way which we have discussed in this study both will give good results but we are momentum traders so we like to use the range of 40 and 60.

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XIV. FIBONACCI RETRACEMENT

Fibonacci retracement is a method of technical analysis for determining the support and resistance levels. Its name has given after the Fibonacci sequence of numbers whose ratios generally provide price levels to which markets tend to retrace a portion of a move before a trend continues in the real or original direction. In the general world, the importance of Fibonacci numbers is significant as it is believed that these numbers are evident in architecture, art, and even in nature.

People firmly believe that if the Fibonacci number sequence is followed in so many aspects, it can be followed in trading also.

A Fibonacci retracement can be made by taking the two extreme points on a chart and dividing the vertical distance by their important Fibonacci ratios. The Retracement is considered to start when it is 0 % while 100 % is a complete reversal of the original price before the move. The Horizontal lines are drawn in the chart for these price levels to provide support and resistance levels. The common levels in the chart are 23.6%,38.2%,50% and 61.8%.

The appearance of retracement can be ascribed to price volatility as described by Burton Malkiel; he is a Princeton economist which he describes in his book. A Random Walk Down Wall Street.

A Fibonacci retracement is a popular tool that is used by technical traders to identify strategic places for transactions, The Retracement concept is used in many indicators such as Gartley patterns, Elliott Wave theory, Tirone levels, and many more. After a weighty movement in price, the new support and resistance levels are often at these lines.

Unlike moving averages, Fibonacci retracement levels are also Static Prices and they do not change, this will allow quick and simple identification and it will allow traders and investors to react when price levels are tested. Because these levels are inflection points, so the traders expect some type of price action, whether it's a break or a rejection.

Fibonacci numbers are derived as follows:

Step 1 – Take the binary numbers 0 and 1.

Step 2 – Keep adding the current number with the previous number.

Step 3 – Thus the sequence will be 0+1 = 1, 1+1=2, 2+1 =3, so the number are 1,2,3,5,8,13,21,34,55,89,144,233---------

Now as we talk about the levels from which generally the price of asset retraces, those levels are determined by the Golden Ratio.

Golden Ratio- A creation of Fibonacci number sequence is computed as

21/34 = 0.618 or 61.8%

21/55 = 0.381 or 38.1%

21/89 = 0.236 or 23.6%

In the calculation of the Golden Ratio, we have to take the number and divide it by the next number, the second next number, and by the third next number. And the ratios will come the same only a minor difference in points will be there.

A. *Analysis Through Fibonacci Retracement, Entry Point, And Exit Point In The Trade Of Bitcoin*

The blue colour ratio zone is showing the basic support levels of Bitcoin, the green levels showing a temporary resistance but also a short trade to enter again and book your profits.

The red colour ratio zone shows high level of resistance from the entry point and the direction of the trade that is at a high point the trend may change and the valuation of Bitcoin might go down from there. Also signifies this as the exit point of the trade.

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The above chart explains the whole theory of TRADING BITCOIN THROUGH TECHNICAL ANALYSIS where the point we entered is on 27th of January at 32900$ i.e., 25 lakhs Indian rupees and hold the trade for a period of 2 months and sold it on 27th March at a point of 48600$ i.e., 36 lakhs and 61 thousand Indian rupees which denote a profit of 11 lakhs 60 thousand Indian rupees in the current time frame.

XV. BOLLINGER BANDS

The term "Bollinger" comes from the surname of a trader named John Bollinger. In the trading view, the Bollinger band is an indicator tool that helps traders to put a different trading setup which is somewhat similar to RSI (Relative strength index) and EMA (Ease of Movement). This tool helps in setting trend lines through a cloud that forms around the trending line and eventually acts as an indication to predict certain buying and selling breakouts, it works on the SMA concept i.e., simple moving average which is and can be modified as per the user interface. One of the major significance it shows is the current stock or asset has been sold to the extent or has been bought to the daily limits.

A. What Does Bollinger Bands Tell You?

There are a no. of indicators which help traders setup different algorithms as well as technical analysis there are a no. of rules for this setup to use under conditions and cannot be applied in every condition as different trading systems have different setups to work upon, this indicator is a highly trending one as the price of a certain stock or a candlestick chart is depicted through on what time frame the trader is trading and what kind of SMA is set up for that time frame.

B. Limitations of Bollinger Bands

The Bollinger bands cannot work as a sole trading setup for most of the stocks index's entry and exit point it has limitations to a specific point which also suggest that it needs to be paired up with one or more indicators to confirm the trend direction to specify the trade is risk-taking or not certain other indicators which put up with the bands are the relative strength index (RSI) and the exponential moving average (EMA). The traders use a different type of SMA simple moving average for different time frames to analyze the long or short term trend direction of the candlestick pattern which defines that the trade which is to be taken should be SHORTED i.e., taken on the pull(sell side) or LONG i.e., taken on the buy-side. So as per my recent trade, we can see how the Bollinger bands helped into proper buying and selling with support and resistance lines and a trend of breakout.

Total profit as per trade:-
Entry at 33000$ at 25 LAC. Approx.
Hold the trade from 25th January to 27th of March
Exited at 48324$ at 36.61 LAC.
Total profits around 11.60 LAC.

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XVI. TARGET PRICE

Investors look for magical returns in a short period of time but being realistic is essential to becoming a better trader. This is our personal observation a one can set their target prices on the basis of their judgments or even the amount of risk they are ready to take in a particular trade. But on the basis of our analysis target price should be a 3-5% return in a span of 10 days and if we get a 3-5% return in 10 days maybe we can square off our trade or if there is no bearish signal then even, we can hold our trade for long too and can bet on better returns. And obviously, we will not always earn a 3-5% return but this should be our target. If we compare the returns with the bank, in India majority of banks give 3-6% of modest return in a year and here we can earn 3-5% in 10 days so there is a big difference in returns.

XVII. STRATEGY FOR STOP-LOSS

Everyone talks about how to make a profit in the stock market or in other asset class but there are few who tells you how to limit losses. And by putting stop-loss in your order you convey a message to yourself that we are willing to lose only this much and making profit is as vital as making losses because mistakes or losses are the ones that teach us more about the market.
Putting stop-loss in your trade is one of the most essential thing and disciplinary things in the trader's life. In our opinion, a trader who respects stop-loss and has the courage to book losses is the one who can make a profit in the near future also.

There are many ways, a trader can put stop-loss in their order.

1) Stop-loss will be equal to the median of the breakout candle. A breakout candle is the one that breaks the resistance or support level and gives us an indication while the crypto will be bullish or bearish.

Median = Opening + Closing ÷ 2

The candle which was formed on 16 March was breaking the resistance level of $2738 and if some has entered in that candle so our stop-loss will be at $2697.57 as we applied the formula of opening plus closing price divided by 2.

2) The second option is, to take the low of that candlestick in which we are making an entry and put it as stop-loss.

Based on the above graph let's assume that we are taking an entry on 4 February, what we have to do is we have to take the low of that candle and put it as stop-loss. And the low of the candle is $37468.99, so it will be our stop loss.

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3) Another way is putting a stop-loss with the help of indicators if we use the Relative Strength Index, we can put stop-loss as if the RSI line touches the level of 40 we will square off our trade. And this we have discussed in Relative Strength Index how we can take an exit when the RSI reaches 40 or it went below 40.

A. *Limitations of the Study*

Technical Analysis is one of the areas of investing where everyone's opinions can contradict because everyone has their own philosophies, some use textbooks philosophies and some make their unique philosophies about the price movements over time.

In our opinion, trading is more psychological so everyone looks at trading differently the methodologies and indicators which we have used in this study may suit some and it may not suit some.

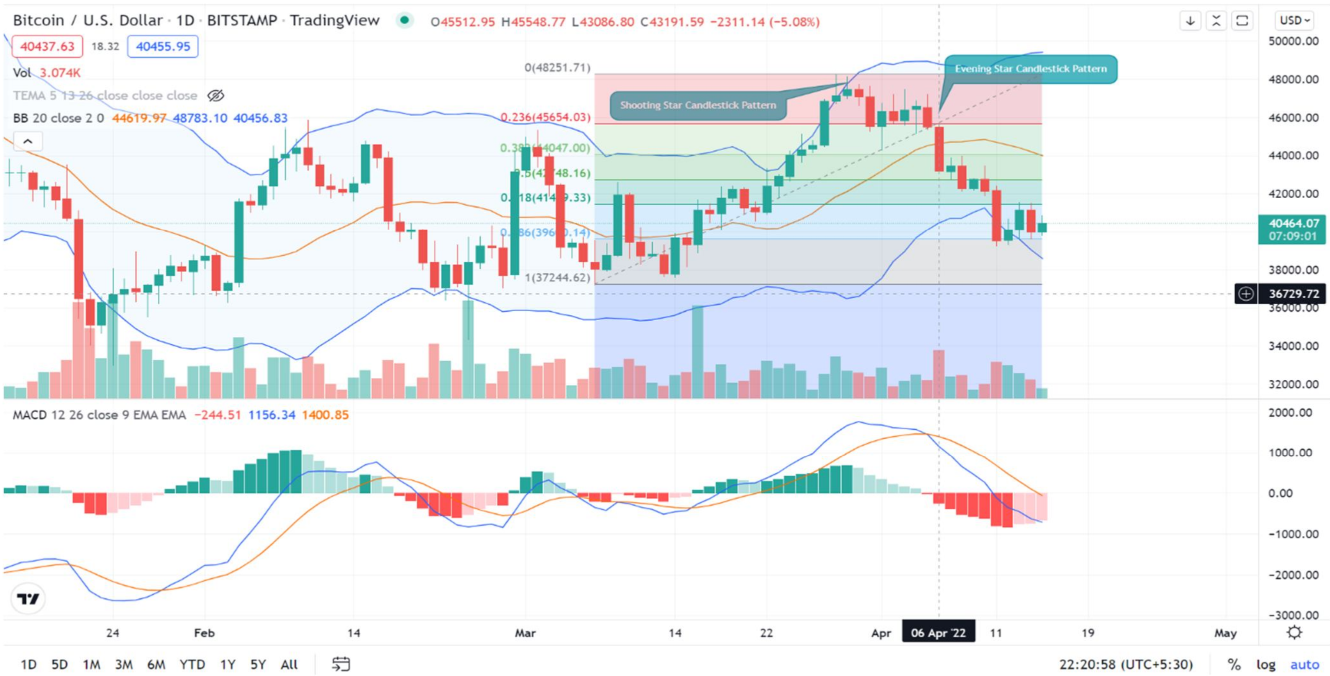
And the indicators and methods we have used in this study can contradict each other. Also, especially for the beginner, it is hard to understand what is the best indicator of technical analysis and how much importance should be given to which indicator.

XVIII. OVERALL ANALYSIS

We have analyzed the various tools of technical analysis separately and have seen their application in the cryptocurrency but now we will do the full analysis by combining all the tools which we have discussed till now. One thing we want to add here, for instance, we have 5 parameters of technical analysis so there is a high chance that every time 5 out 5 parameters will not give a ‘Buy’ or ‘Sell’ signal so what we can do is if someone is a conservative investor or a beginner can wait for confirmation of 4 parameters otherwise, he/she can ignore that trade at a particular point of time. But if someone is an aggressive investor he/she can trade when 3 out of 5 parameters are giving a particular signal. There are people who might trade on 1 or 2 parameters only and they earn a ton of money but as a trader, we feel much safer when there is more signal and the probability of making money is more when there are more confirmations on the positive side.

Look at the two pictures above and see how beautifully the technical analysis is predicting the future price movement of bitcoin, on 29 March 2022 the shooting star candlestick is formed which is a bearish candle, and subsequently, see the next candle giving the confirmation of the downtrend and look at MACD also how from 30 march 2022 it has started showing weakness and when on 5 April 2022 the evening star is formed at that particular MACD line cuts the Signal line from above which shows that market has become bearish and if we look at 5 DEMA it is also in a downtrend, after a few days it has cut the 13 DEMA and 26 DEMA line from above but which is too late obviously as we have discussed that Moving Averages are lagging indicator but look the significance of MACD in this particular case like it has shown the weakness so early which helps a trader to take an early call based on MACD.

And if we look at the second picture the RSI is also in a downtrend which is a good signal for bears according to what we have discussed so when the evening star is formed the RSI was in the range of 40-50 but one things here is a worth to note is RSI is in downtrend but we have discussed when it is 40 or below 40 then we should sell. So RSI is not giving a sell signal but surely other tools are giving a strong sell signal.



We have added the Bollinger band and Fibonacci retracement, Fibonacci the candle which is formed on 1 April 2022 has breakdown the support level that is forming at 23.6% and this is the opportunity where one can enter the market or one can wait for the next candle to be formed if someone wants to be sure of the trade but the next few candles took the support at that particular level but finally, the candle which is formed at 6 April 2022 has broken down the level of 38.2% and this is the signal that from now the price will go down barring any external factor incur. One thing we can learn in this too is that we have seen that the candle of 1 April 2022 has breakdown the level but after that market moves in the sideways trend which teaches an important lesson that market will not be like up or down always sometimes despite the strong signals a trader have to sit tight and if the market doesn't move in which a trader is hoping the market to move then it is wise that a trader respects their stop-loss and take an exit from the market.

Coming to Bollinger bands, it is self-explanatory that the candle of 6 April 2022 has broken 20 DEMA line support which shows that market is turning bearish only.

We have given the emphasis on candlesticks and we have said many times that over time everyone creates their analogies and every method can earn you money and even every method will have some flaws.

NOTE: We have used three pictures in the analysis because we want to explain it clearly.

XIX. CONCLUSION

There have been many different volumes of textbooks written on the Technical Analysis. Technical analysis is one of the fields where everyone has a different theory on what works and what does not work. Backtesting is looking back at several years' worth of charts to see how a particular cryptocurrency reacts. Different securities do different things, so be sure to do the homework first. The main points to remember about technical analysis are: It is a method of evaluating securities by analyzing statistics which is generated by market activity, past prices, and volumes. Over a straight-line graph, the advantage of using Candlesticks is that it shows the low, high, close, and open for each particular day. And every pattern of a candlestick has its own meaning and an astute person can take trades on the basis of all those patterns. We have used the major 6 patterns of candlesticks which is best for reversal and we have proved in this study how those patterns effectively work in the analysis of bitcoin and why the confirmation candle is important for the entry and when we can take the exit on the basis of candlesticks.

Candlestick pattern like a morning star is so powerful if someone wants to go long in the market and one thing we have to understand is that every day is not sunny so these patterns which we have discussed will not form every day, a person in trading needs patience for the entry and the exit and if someone takes decision in a hurry the chances of incurring loses are higher. And all of those who like to take trades based on candlesticks will require a lot of patience. Volumes are one other area which shows how we can use it with candlesticks pattern and for the swing trading how we can interpret the behavior of the buyers and sellers by comparing the particular day volume with the previous 5 days volume. And big volume with a breakout candle is always a great sign for entering the market because it shows that traders are confident that the market will go up so the chances of earning profit during this are higher. If we talk about entry and exit the importance of Support and Resistance becomes vital.

Support and Resistance levels are the price levels at which movement should stop and reverse direction. This support/ Resistance is as levels that act as a floor or a ceiling to future price movements. We have shown in this study how we can enter and exit by the usage of support and resistance levels. And even support and Resistance play a crucial role in setting our stop-loss and target price. A breakout candle that broke the resistance level and its low can be used as a stop loss. When someone is entering the market on a minor resistance zone and can set a major resistance zone as a target price. And there are other methods like the median of the breakout candle to set the stop-loss.

Another thing that we have discussed is Moving Averages, which is one of the most basic and easy ways of using technical analysis indicators, which shows the average value of a security's price over a period of time. In moving averages, we have taken 5DEMA, 13 DEMA, and 26 DEMA. The reason behind all of these particular ranges have been discussed and, in our opinion, these are the best range for short-term trading. But one of the limitations which we have seen of moving averages is that they are the lagging indicator so they give signals a bit late than any other indicator which can result in some profits which we can miss. But in totality, it is a good indicator and if someone is a passive investor or starting their career in investing and they want to learn rather than earn so in the early stages they can use moving averages but a person who wants to be ahead can miss out the moving averages and can follow other indicators. Coming to another indicator, we have talked about Moving Averages convergence divergence. MACD is one of the leading indicators in technical analysis and it shows the strength or weakness of the security first and then the price reacts according to it. A simple crossover strategy is used in MACD when the MACD line crosses the signal from below it is "Buy Call' and if it's from above it generates the "Sell Call". Not only crossover strategy but we can trade on the basis of MACD Divergence like a strong MACD bullish divergence occurs when the price makes the downtrend but the MACD line is making uptrend and vice-versa for the bearish divergence. Another indicator that we have discussed is the Relative Strength Index. The Relative Strength Index is an indicator of momentum that is used in the technical analysis which measures the magnitude of the recent prices changes to evaluate oversold conditions in the price of a stock or the other assets. RSI has a range from 0 to 100. In RSI we have not used the traditional method which is given by the founder but we have used another method which we can say a 'new way'. We have taken the levels of 60 and 40. When RSI is above 60 it generates a "Buy Call' and if it's below 40 then it generates a "Sell call". There is our one piece of advice here don't enter or exit at exactly 60 and 40 for the entry let's wait for 61 or 62 and apply technique while exiting. The whole sense of taking these levels as there is a high chance of security doing good when it is in momentum rather than when it is down. So, if RSI is 60 or above 60 it means that particular security is in a good momentum and we want to invest in that momentum so that we can make money.

The other thing which we have seen in this study was Fibonacci retracement. The importance of Fibonacci numbers is very well defined by many authors and how our lives evolve around Fibonacci numbers we have shown in this study how Fibonacci numbers play a crucial role in technical analysis and Fibonacci retracement can be drawn by the joining the lowest point on the screen to the highest point on the screen. The common levels in the chart are 23.6%,38.2%,50% and 61.8% and these are levels from which the security can retrace. And these levels also act as a support and resistance for the price and we can take a trade based on that. The other thing which we have analyzed in this study was the Bollinger band, in Bollinger bands 95% of the time the price will remain in the band, and in that 5%, our earning chance arises. The 20 DEMA line in the Bollinger band act as a support if the current price is above the 20 DEMA line and it acts as support if it's below 20 DEMA. For the trading, we have to wait for the breakout. The width of the band defines volatility if the width is less it is less volatile and if the width is more then it is highly volatile. We can also trade when Bollinger band squeeze is formed. BB squeeze occurs when there is very low volatility and if this continues for more than 1 month and if the current candle breaks the upper BB then it is a "Buy Call". The things which we have analyzed have their own importance and everything in technical is a bit different to each and even same to each other. With this study in our humble opinion, we can say that technical effective work on cryptocurrency.

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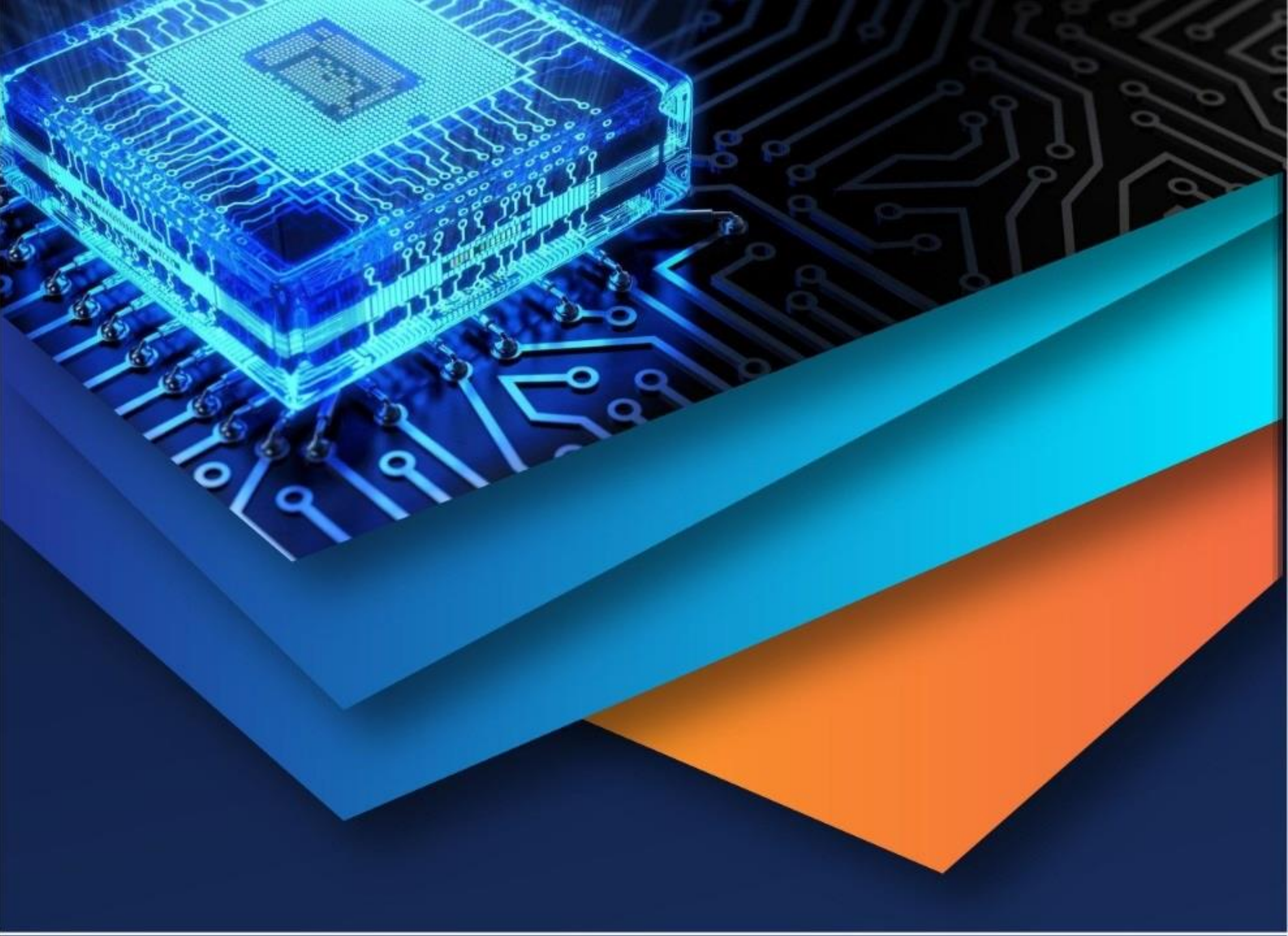

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