Developing Your Own Strategy for Trading Digital Assets

Dmitrii Khusnutdinov

Bachelor's thesis
2024

Tomas Bata University in Zlín
Faculty of Management and Economics

Univerzita Tomáše Bati ve Zlíně
Fakulta managementu a ekonomiky
Ústav financí a účetnictví

Akademický rok: 2023/2024

ZADÁNÍ BAKALÁŘSKÉ PRÁCE

(projektu, uměleckého díla, uměleckého výkonu)

Jméno a příjmení:	**Dmitrii Khusnutdinov**
Osobní číslo:	**M21026**
Studijní program:	**B0412P050001 Finance a finanční technologie**
Forma studia:	**Prezenční**
Téma práce:	**Tvorba vlastní strategie pro obchodování s digitálními aktivy**

Zásady pro vypracování

Úvod
Definujte cíle práce a použité metody zpracování práce.
I. Teoretická část

- Poskytněte komplexní teoretické základy o obchodních strategiích, různých typech digitálních aktiv a obchodních platformách.
- Určete zásadní komponenty potřebné pro formulaci personalizované obchodní strategie.

II. Praktická část

- Vytvořte obchodní strategii a proveďte testování na vybraném aktivu.
- Analyzujte efektivitu vyvinuté obchodní strategie a navrhněte vylepšení.

Závěr

Rozsah bakalářské práce:	**cca 40 stran**
Forma zpracování bakalářské práce:	**tištěná/elektronická**
Jazyk zpracování:	**Angličtina**

Seznam doporučené literatury:

KIRKPATRICK II, Charles and DAHLQUIST, Julie. *Technical Analysis: The Complete Resource for Financial Market Technicians*. 3rd. ed. Upper Saddle River: FT Press, 2015. ISBN 978-0-13-413704-9.
PRING, Martin. *Technical analysis explained: The successful Investor's Guide to spotting investment trends and turning points*. 5th. ed. New York City: McGraw-Hill Education, 2014. ISBN 978-0-07-182517-7.
SCHABACKER, Richard. *Technical Analysis and Stock Market Profits (Harriman Definitive Edition)*. Petersfield: Harriman House, 2021. ISBN 978-0-85-719916-4.
SCHLOTMANN, Rolf and CZUBATINSKI, Moritz. *Trading: Technical Analysis Masterclass: Master the financial markets*. Offenbach: Independently published, 2019. ISBN 978-1-79-547185-5.
TEO, Rayner. *Price Action Trading Secrets: Trading Strategies, Tools, and Techniques to Help You Become a Consistently Profitable Trader*. Singapore: The National Library of Singapore, 2021. ISBN 978-9-81-146494-2.

Vedoucí bakalářské práce:	**Ing. Martin Jančík**

Datum zadání bakalářské práce:	**5. února 2024**
Termín odevzdání bakalářské práce:	**17. května 2024**

L.S.

prof. Ing. David Tuček, Ph.D.
děkan

doc. Ing. Adriana Knápková, Ph.D.
garant studijního programu

Ve Zlíně dne 5. února 2024

BACHELOR'S/MASTER'S THESIS
AUTHOR STATEMENT

I hereby acknowledge that:

- Upon final submission of my Bachelor's/Master's Thesis, I agree with its publishing in accordance with Act No. 111/1998 Coll., on Higher Education Institutions and on Amendment and Supplements to Some Other Acts, (The Higher Education Act), without regard to the defence result;
- My Bachelor's/Master's Thesis will be released in electronic form in the university information system, accessible for reading only; and one printed copy of the Bachelor's/Master's Thesis will be stored on electronic media in the Reference Library of the Faculty of Management and Economics of Tomas Bata University in Zlín;
- To my Bachelor's/Master's Thesis fully applies Act No. 121/2000 Coll., on Copyright, Rights Related to Copyright and on the Amendment of Certain Laws (Copyright Act) as subsequently amended, esp. Section 35 Para 3;
- In accordance with Section 60 Para 1 of the Copyright Act, TBU in Zlín is entitled to enter into a licence agreement about the use of the Thesis to the extent defined in Section 12 Para 4 of the Copyright Act;
- In accordance with Section 60 Para 2 and 3, I can use my Bachelor/Master's Thesis, or render the licence to its use, only with the prior expressed written agreement of TBU in Zlín, which is in such case entitled to require from me appropriate financial compensation to cover the cost of creating the Bachelor/Master's Thesis (up to the total sum);
- If the software provided by TBU or other entities was used only for study and research purposes (i.e. for non-commercial use) in the development of the Bachelor/Master's Thesis, it is not possible to use the Bachelor/Master's Thesis commercially;
- In the event that the Bachelor/Master's Thesis output encompasses any software product, source codes and/or files of which the project consists of are considered part of the Thesis. Failure to submit this part of the Thesis may result in an unsuccessful defence of the Thesis.

I herewith declare that:

- I have created this Bachelor/Master's Thesis on my own and cited all used sources. In case the results are published, I shall be cited as author.
- The contents of the Bachelor/Master's Thesis handed over are identical with the electronic version entered in the IS/STAG.

Zlín 26.04.2024 .....
date signature

Name and surname: DMITRII KHUSNUTDINOV

ABSTRAKT

Tato bakalářská práce provádí komplexní analýzu různých obchodních strategií používaných v technické analýze, přičemž podrobně popisuje metody a podmínky jejich použití. Dále zkoumá zásadní aspekty nezbytné pro formulaci a vývoj osobní obchodní strategie. Hlavním cílem této práce je vytvořit obchodní strategii, která bude efektivně fungovat na trhu digitálních aktiv, jako je trh s kryptoměnami, s cílem minimalizovat rizika a maximalizovat potenciální zisky.

Tato bakalářská práce zahrnuje zpětné testování osobně vyvinuté obchodní strategie pomocí historických dat, analýzu její účinnosti, implementaci vylepšení na základě zjištěných výsledků a následné použití na reálném trhu s reálným kapitálem. Zvláštní pozornost je věnována analýze tržních podmínek a zdokonalení metod řízení rizik.

Klíčová slova: digitální aktiva, obchodní strategie, technická analýza, backtesting, kryptoměna, dynamika trhu, řízení rizik.

ABSTRACT

This study conducts a comprehensive analysis of various trading strategies used in technical analysis, detailing the methods and conditions of their application. It also explains the aspects required for formulating and developing a personal trading strategy. The aim of this bachelor's thesis is to create a trading strategy that can operate effectively in the digital assets market, such as the cryptocurrency market, minimizing risks and maximizing potential profits.

This bachelor's thesis also includes backtesting of the developed own trading strategy using historical data, analyzing its effectiveness, implementing improvements, and applying it in the real market with real money. Special attention is given to the analysis of market conditions and risk management methods.

Keywords: digital assets, trading strategy, technical analysis, backtesting, cryptocurrency, market dynamics, risk management.

I would like to express my sincere gratitude to my supervisor, Ing. Martin Jančík, for his invaluable guidance, patience, and expert advice throughout the course of writing this bachelor's thesis. His mentorship was crucial in shaping both the direction and success of this work. His professional knowledge and experience greatly assisted in the writing of this thesis, and I am very pleased to have had the honor of working with Ing. Martin Jančík. I am immensely thankful for his dedication and the time he invested in helping me achieve my goals.

"The goal of a successful trader is to make the best trades. Money is secondary." - Alexander Elder.

I hereby declare that the print version of my Bachelor's/Master's thesis and the electronic version of my thesis deposited in the IS/STAG system are identical.

CONTENTS

INTRODUCTION **9**

I. THEORETICAL PART **11**

1 TRADING STRATEGIES **12**

1.1 FUNDAMENTALS OF TRADING AND INVESTMENT STRATEGY THEORY 12
1.1.1 Why technical analysis works *13*
1.1.2 Role of technical analysis in the theory of trading strategies *14*
1.2 VARIOUS TYPES OF TRADING STRATEGIES 14
1.2.1 Trend *16*
1.2.2 Support and resistance levels *18*
1.2.3 Moving averages *19*
1.2.4 Relative strength index (RSI) *23*
1.2.5 Volume *25*
1.2.6 Chart patterns *27*
1.3 KEY PRINCIPLES OF TRADING STRATEGIES AND THEIR APPLICABILITY IN DIFFERENT MARKET CONDITIONS 36
1.3.1 Entry rules *36*
1.3.2 Exit rules (take-profit and stop-loss) *37*
1.3.3 Time frames *39*
1.3.4 Market conditions (volatility) *40*
1.4 RISK MANAGEMENT 40
1.5 ESSENTIAL COMPONENTS FOR DEVELOPING YOUR OWN TRADING STRATEGY 42

2 DIGITAL ASSETS TRADING **44**

2.1 DEFINITION AND OVERVIEW OF DIFFERENT TYPES OF DIGITAL ASSETS 44
2.1.1 Overview *44*
2.1.2 CBDC *44*
2.1.3 Cryptocurrencies *46*
2.2 REVIEW AND COMPARISON OF VARIOUS TRADING PLATFORMS 47
2.2.1 Centralized Exchanges (CEXs) & Decentralized Exchanges (DEXs) *47*
2.2.2 Comparison of trading platforms *49*

3 SUMMARY OF THE THEORETICAL PART **55**

II. PRACTICAL PART **56**

4 TRADING STRATEGY DEVELOPMENT **57**

4.1 DEFINING THE GOALS AND OBJECTIVES OF THE TRADING STRATEGY 57
4.2 SELECTING AN ASSET FOR IMPLEMENTING THE TRADING STRATEGY 59
4.3 DEVELOPING THE TRADING STRATEGY 60
4.3.1 Strategy components *60*
4.3.2 Trading & Charting platforms *62*
4.3.3 Position size calculator *62*

5 ANALYSIS OF THE EFFECTIVENESS OF THE DEVELOPED TRADING STRATEGY **64**

5.1 CONDUCTING BACKTESTING 64
5.2 ANALYSIS OF THE BACKTESTING RESULTS 65
5.3 OPTIMIZING THE TRADING STRATEGY BASED ON BACKTESTING INSIGHTS 67

6 TRADING STRATEGY IMPLEMENTATION 69

6.1 EXECUTING TRANSACTIONS WITH THE SELECTED ASSET ON THE TRADING PLATFORM 69
6.2 RESULTS 103
6.3 ANALYZING THE EFFECTIVENESS OF THE DEVELOPED TRADING STRATEGY 106

7 SUMMARY OF THE PRACTICAL PART 108

THE MAIN CONCLUSION OF THE PRACTICAL PART IS THAT WITH PROPER SETUP AND MANAGEMENT, THE DEVELOPED TRADING STRATEGY CAN BE EFFECTIVELY USED TO TRADE DIGITAL ASSETS, YIELDING SIGNIFICANT PROFITS AT A MODERATE LEVEL OF RISK. 109

CONCLUSION 110

BIBLIOGRAPHY 112

LIST OF ABBREVIATIONS 117

LIST OF FIGURES 118

LIST OF TABLES 121

INTRODUCTION

In this bachelor's thesis, the aspect of various trading strategies is examined, followed by the creation of a proprietary trading strategy that would generate profit while managing risks for systematic trading on the cryptocurrency market.

The significance of this study is dictated by the need for a deep understanding and the ability to apply knowledge about market analysis, particularly technical analysis. Technical analysis offers a variety of different trading methods. The complexity of technical analysis lies in the fact that all these methods work to different degrees, and these methods can and should be used based on specific conditions and objectives that need to be achieved. However, the most challenging part is combining these technical analysis techniques to develop a trading strategy that can be clearly followed for trading in the market.

For the development of the trading strategy, various literary sources as well as historical data on the charts of different assets will be used. The result of this work will be a model that will ultimately not only be tested on historical data but also in real conditions on the exchange with real money. The outcome of this work is expected to provide a model that will help traders not only increase their income but also minimize potential risks.

OBJECTIVES AND METHODS OF THE STUDY

Objectives of the study: The main objective of this bachelor's thesis is to develop a proprietary trading strategy that should minimize risks and maximize potential profits in the cryptocurrency market.

To create such a strategy, this thesis will:

1. Provide comprehensive theoretical foundations about trading strategies, various types of digital assets, and trading platforms.
2. Identify essential components necessary for formulating a personalized trading strategy.
3. Develop and test a trading strategy on selected assets.
4. Analyze the effectiveness of the developed trading strategy and suggest improvements.

Methods of the study:

1. Technical analysis, including chart patterns and popular indicators.
2. Backtesting of on historical data in order to find areas for improvements.
3. Financial modeling for performance forecasting and determining profitability goals of the strategy.
4. Risk management, including setting stop-loss orders, determining appropriate position sizes, and applying a risk-reward ratio to balance potential gains against possible losses.
5. Position size calculation to ensure that trades do not exceed the set risk threshold per trade, which helps in maintaining discipline in risk exposure.
6. Market conditions analysis to adapt and the correct the trades in real time.
7. Quantitative analysis to analyze trading data.

I. THEORETICAL PART

1 TRADING STRATEGIES

1.1 Fundamentals of trading and investment strategy theory

The essence and purpose of trading is to generate profits through performing systematic transactions (trades) based on a specific trading strategy. Many beginners who want to succeed in trading make a fatal mistake by trading without a particular plan. In this section there will be explored what a trading strategy is in general and what essential elements must be present in a trading strategy for it to be successful.

It's crucial to realize that there is no "perfect" strategy that suits all traders. Everyone will always have different requirements for their trading strategy, different risk tolerances, and different amounts of time they can dedicate to trading, etc. As Fitschen (2013, p. 1) notes, *"some traders envision a tradeable strategy as one that never loses a trade, never has a losing day, and at least doubles your money each year… but you'll never find a strategy that meets those criteria."*

It is extremely important to adopt a measured approach to trading and to the process of developing the strategy. This includes recognizing that any strategy may have limitations, understanding the importance of performance metrics, and customizing the strategy to match personal risk tolerance. By applying all these steps, it is possible to attempt to develop a strategy that matches the personal trading preferences and is as practical as possible. (Fitschen, 2013, p. 1)

Most trading strategies rely on one of two analytical methods: technical or fundamental analysis, with some strategies incorporating a combination of both.

According to Schlotmann, Czubatinski (2019, p. 12), technical analysis is *"a concept that can be used to analyse the price movements of financial instruments with the objective of identifying profit opportunities."*

In contrast, fundamental analysis takes a different approach, focusing on evaluating the intrinsic value of an asset. It examines economic, financial, and other qualitative and quantitative factors to ascertain an asset's worth. Fundamental analysis is based on the belief that the market may not always reflect an asset's real value. Thus, it should provide investors with opportunities to profit from differences between price and value. (Krantz, 2023, p. 22)

Next, I will delve deeper into the essentials of technical analysis. However, before I get into that part, it's crucial to understand why technical analysis is effective, its underlying principles, and the conditions under which it works.

1.1.1 Why technical analysis works

Schlotmann, Czubatinski (2019, p. 12) offers several explanations for its effectiveness. First, he explains the effectiveness of technical analysis by highlighting consistent human behavior: *"Technical analysis is so effective because people always follow the same behavioral patterns and often make their trading decisions collectively based on similar emotions."*

Furthermore, he attributes its success to the *"principle of the self-fulfilling prophecy."* (Schlotmann, Czubatinski, 2019, p. 12).

Schlotmann, Czubatinski (2019, p. 12) elaborates that because a lot of people follow the concepts of technical analysis and make decisions that are based on them, they verify the fact that technical indicators and other concepts work simply because they are widespread. Moreover, even the media *"often refer to technical concepts such as past highs and lows, all-time highs and lows, psychologically important price levels and moving averages."* (Schlotmann, Czubatinski, 2019, p. 12)

It's also important to consider the historical context of technical analysis, to gain a deeper understanding of it. Richard Schabacker's perspective is particularly relevant as it connects the gap between the fundamental factors and their technical outputs. Schabacker, a key figure in technical analysis, explained how trading charts can show us more than just numbers and lines. Schabacker (2021, p. 4) concludes that fundamental factors that have an impact on the market could be detected within the various trading patterns: *"In the record of such trading all of these many and varied fundamental factors are brought to bear, are evaluated and automatically weighted and recorded in net balance on the stock chart."* This assertion underlines the chart of an asset not just as some technical tool but as a representation of fundamental influences.

Moreover, Schabacker (2021, p. 6) stays behind in his point that a chart has a huge benefit in terms of analysis; he calls it *"the new science"* of the technical chart action. He points out that a trading chart doesn't just track prices; it helps us understand the patterns of how an asset moves over time. *"Technical market action is that aspect of analysis based upon phenomena arising from the market itself"* (Schabacker, 2021, p. 6)

For Schabacker, technical analysis was not just a tool; it was a discipline that could transform the actions of the market into a visual form – a chart. According to him, charts were not only graphical representations of the price. They were the story of the market that captures the cumulative outcome of all fundamental events and investor actions.

In conclusion, fundamental analysis gives an understanding of an asset's economic and financial fundamentals, while technical analysis is based on market behavior and chart patterns.

1.1.2 Role of technical analysis in the theory of trading strategies

Considering the remarkable advantages of technical analysis, this bachelor's thesis will emphasize creating a trading strategy entirely based on this method. Technical analysis accentuates market behavior and chart patterns as an extremely powerful tool for forecasting future price movements. Using chart patterns, technical indicators, and price action, my trading strategy will aim to figure out trading opportunities exclusively based on the chart price action, excluding fundamental analysis.

The decision to develop a trading strategy based on technical analysis relies on its historical effectiveness and the argument that all relevant information about the asset’s price is already depicted in the chart. This approach aligns with Richard Schabacker's views on the whole nature of charts, as they potentially include all possible market factors, both known and unknown. The developed strategy will be based on the assumption that all price patterns and trends can provide a solid foundation for forecasting future market behavior, allowing one to make decisions solely based on technical insights.

Thus, this bachelor thesis will explore the intricacies of technical analysis and will also delve into creating a practical and reliable trading strategy based on it. By applying this methodical approach to technical analysis, the goal is to develop a strategy that would be profitable, robust, and capable of withstanding different market conditions. This will demonstrate the practical application of technical analysis as a standalone strategy in trading.

1.2 Various types of trading strategies

The topic quickly becomes extensive and contradictory regarding different types of trading strategies. The fact is that in trading or investing, it is impossible to single out or create one trading strategy that will satisfy the trader in all its aspects: the ability to work in all market cycles, have a small drawdown, a low risk/reward ratio, high profitability, etc. Such a

strategy does not exist (at least, they are unavailable to the public). When developing your trading strategy, you must balance many factors. It all depends on the personal needs of the trader, such as their risk tolerance, trading style (short-term, medium-term, long-term), and how much time they are willing to spend refining their strategy, etc.

Rayner Teo (2021, p. 22) states: *"There's no such thing as the best trading strategy because "best" is subjective."* Teo (2021, p. 18) then clarifies that "best" could mean many things and be different for everyone: highest returns, lowest drawdown, least time required, low capital requirements, etc. *"So instead of looking for the best trading strategy, you first have to know what your trading goals are. Once you understand that, you can select the 'best' trading strategy to meet your goals."* (Teo 2021, p. 18)

Again, I want to confirm my words about the insufficiency of having just one trading strategy for all occasions:

In support of my point about the insufficiency of having a single trading strategy for all occasions: *"Trading strategies attempt to exploit certain 'patterns' in the markets."* (Teo 2021, p. 18). This emphasizes the idea that the effectiveness of a strategy depends on market conditions.

Continuing the thought: *"If you want a trading strategy to work all the time, market conditions must remain the same."* (Teo 2021, p. 18). However, as is well known, the market is constantly changing, making it impossible for any strategy always to be effective.

Further: *"The market is always changing. It can move from an uptrend to a downtrend, from low volatility to high volatility, and so on."* (Teo 2021, p. 18). This confirms the notion that strategies require adaptation to current conditions.

The concluding thought emphasizes the importance of flexibility: *"Instead of using a single trading strategy... it's better to go through cycles of ups and downs*." (Teo 2021, p. 18). This highlights that the key is preserving profits during good times to cover losses during the bad.

Overall, due to the constant changes in the market and its cycles, a trading strategy will always need to be refined from time to time or completely changed to a different one, depending on market conditions.

1.2.1 Trend

Some of the most popular frequently used, and relatively simple trading strategies will be those based on the so-called trend. This is like a foundation (along with support and resistance levels, which I will discuss later) on which many other trading strategies are built.

What is a trend? In technical analysis, a trend is defined as the prevailing direction of price movement of a financial instrument (Mitchell, 2021)

Kirkpatrick II, Dahlquist (2015, p. 9) say the following about trends: *"Technical analysis is based on one major assumption—trend. Traders hope to buy a security at the beginning of an* ***uptrend at a low price, ride the trend, and sell the security when the trend ends at a high price."***

Kirkpatrick II, Dahlquist (2015, p.9) observe a notable aspect of market trends: *"Trends of different lengths tend to have the same characteristics."* This statement underscores the universal nature of trend behaviors across various time frames.

They elaborate further: *"A trend in annual data will behave the same as a trend in five-minute data."* Kirkpatrick II, Dahlquist (2015, p.9). This comparison highlights the consistency in trend characteristics, irrespective of the time scale.

Kirkpatrick II and Dahlquist emphasize the importance of investor priorities: *"Investors must choose which trend is most important for them based on their investment objectives."* Kirkpatrick II, Dahlquist (2015, p.9) This suggests that personal investment goals are crucial in selecting trends to monitor.

They point out the diversity among investors*: "One investor might be more concerned about the business cycle trend... Another investor might be more concerned about the trend over the next six months."* Kirkpatrick II, Dahlquist (2015, p.9). This diversity indicates that different investors may prioritize different aspects of market trends.

Finally, they conclude with the adaptability of trend analysis: "*Although individual investors and traders have investment time horizons that vary greatly, they can use the same basic methods of analyzing trends."* Kirkpatrick II, Dahlquist (2015, p.9) affirm that the fundamental trend analysis techniques remain applicable across the board despite varied investment horizons.

These trends properties allow us to apply them to our trading strategy anytime, from intraday to swing trades.

There exist three main types of trends:

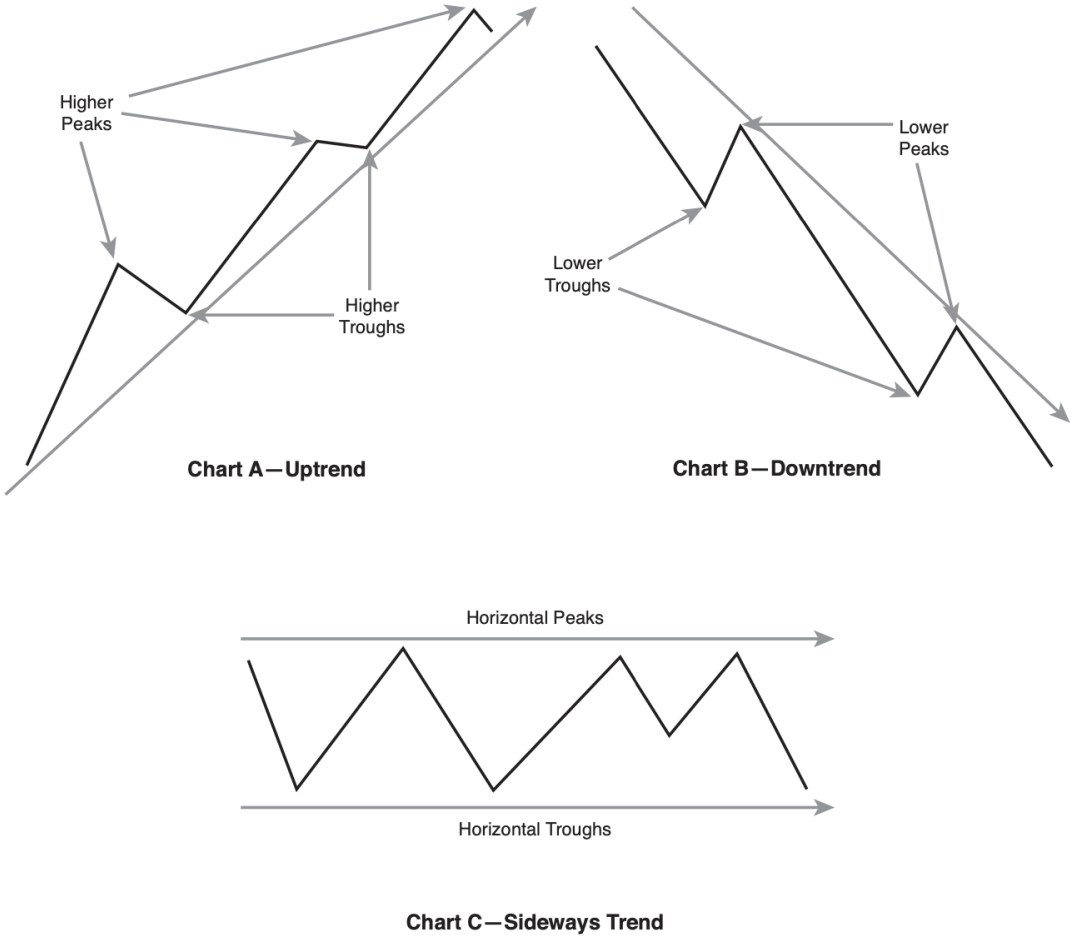


Figure 1: The trend. Source: Kirkpatrick II, Dahlquist, 2015, p.11.

Uptrend (bullish): *"A rising trend, or uptrend, occurs when prices reach higher peaks and higher troughs."* (Kirkpatrick II, Dahlquist, 2015, p.11)

Downtrend (bearish): *"A declining trend, or downtrend, is the opposite—when prices reach lower troughs and lower peaks."* (Kirkpatrick II, Dahlquist, 2015, p.11)

Horizontal (sideways, flat): *"A sideways or flat trend occurs when prices trade in a range without significant underlying upward or downward movement."* (Kirkpatrick II, Dahlquist 2015, p.11)

After I have defined the essence and basic types of the trends, let's consider specific methods for identifying trends on charts and discuss specific trading strategies based on trends.

When it comes to utilizing the trend and opening some trades, here is the most popular use case of trends: opening a position in the direction of the trend. It's straightforward: we're opening a long position if there's an uptrend. On the contrary, our priority becomes a short

trade if the asset's price is currently in a downtrend. (Trend Trading: Definition and How Strategy Aims For Profit.)

1.2.2 Support and resistance levels

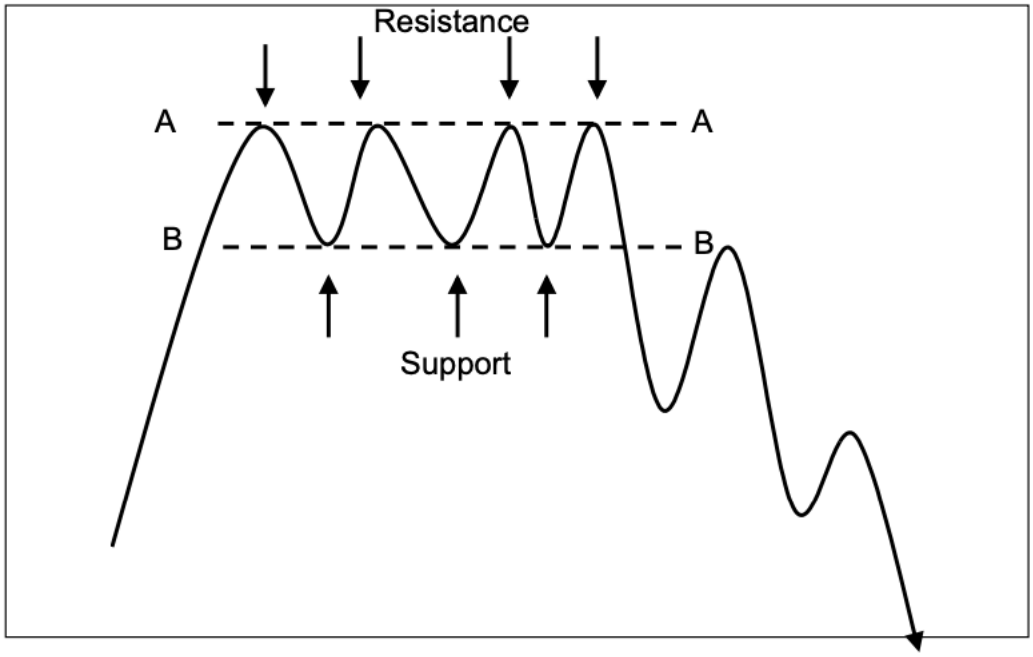


Figure 2: Trading Range Reversal. Source: Pring, 2014, p.117

Moving on to the next "brick" in the foundation of technical analysis—support and resistance levels. Again, it is one of the mastodons of all trading strategies, as almost no trading strategy can do without support and resistance levels. They can be used in different ways: as a signal to enter or exit a position, as a level for setting take profits and stop losses, to assess future possible price movements based on bounces and breakouts from support and resistance levels, and much more. This is just a tiny part of how these levels can be applied.

To confirm my words, I will quote Wade, Simeri (2022, p. 18): *"Supports, resistances and indicators give a perspective on the market, on how to open favorable positions, identify trends, patterns, key levels and targets."*

Kirkpatrick II, Dahlquist, (2015, p. 230) explain well what resistance levels are: *"When prices have been rising and then reverse downward, the highest point in the rise, the peak, is referred to as a resistance point, a level at which the advance has met with selling 'resistance.'"*

In other words: *"It is the level at which sellers are as powerful and aggressive as the buyers and halt the advance*." (Kirkpatrick II, Dahlquist, 2015, p. 230)

The same can be said about the support level: *"A support point is the opposite of a resistance point in that it is a single trough. At the support point, buyers become as powerful or aggressive as the sellers and halt a price decline."* (Kirkpatrick II, Dahlquist, 2015, p. 230)

After it's been discussed what support and resistance levels represent, it's time to understand how I can use them in trading. As I have already said, there are several ways. One of them: *"The concept of support and resistance presumes that in the future prices will stop at these recorded levels or zones and that they represent a remembered psychological barrier for prices."* (Kirkpatrick II, Dahlquist, 2015, p. 230).

Miller (2022, p. 8) explains that traders often decide whether to enter or leave a trade when prices hit important support or resistance levels. Prices usually do two things at these levels: bounce back or breakthrough. Traders use this moment to guess what will happen next in the market. If they guess wrong and the price moves against them, they might face a slight loss if they have set a stop-loss. But if they're right, they could make a significant profit.

In other words, this valuable property of support and resistance levels can be used in several ways:

1. As levels near which you can set your Take-Profit or Stop-Loss (Exit a position)
2. As levels at which, upon a bounce/breakout, you can enter (or exit) a position, as it will signal that this level has held up/did not hold, respectively.

1.2.3 Moving averages

One of the most frequently used indicators is the moving average. *"A moving average is an indicator that is used by most traders, whether they advocate technical indicators or not. These traders use this indicator to predict short-term price movement and identify a reliable level of support/resistance."* (Miller, 2022, p.13)

The most common way to apply MAs is to use them as a dynamic level of support/resistance: "Major Technical Principle: Moving averages should be thought of as a dynamic level of support and resistance" (Pring, 2014, p.209)

Figure 3: Moving Average. Source: Millier, 2022. p.13

There are several types of MAs: *"The three principal types of MAs used in technical analysis are simple, weighted, and exponential."* (Pring, 2014, p.209)

As we advance, during my bachelor's thesis, we will adhere to one type of MA - SMA (Simple Moving Average).

Martin J. Pring (2014, p. 209) provides us with a good explanation of how SMA (Simple Moving Average) works: *"It is constructed by totaling a set of data and dividing the sum by the number of observations. The resulting number is known as the average or mean average."*

He then explains the main principle of a moving average: *"Generally speaking, a rising MA indicates a rising trend (market strength), and a declining one denotes weakness."* Pring (2014, p. 210)

Speaking about the following valuable properties of MAs, we can discuss the entry signal for entering a trade using the moving average. The condition for entering a trade will be the Moving Average Crossover – "A crossover is any penetration of an MA." (Pring, 2014, p.213).

In this case, when the price chart crosses the MA line from bottom to top, it will be a long signal, and when the price chart crosses the MA line from top to bottom, it will be a short signal accordingly.

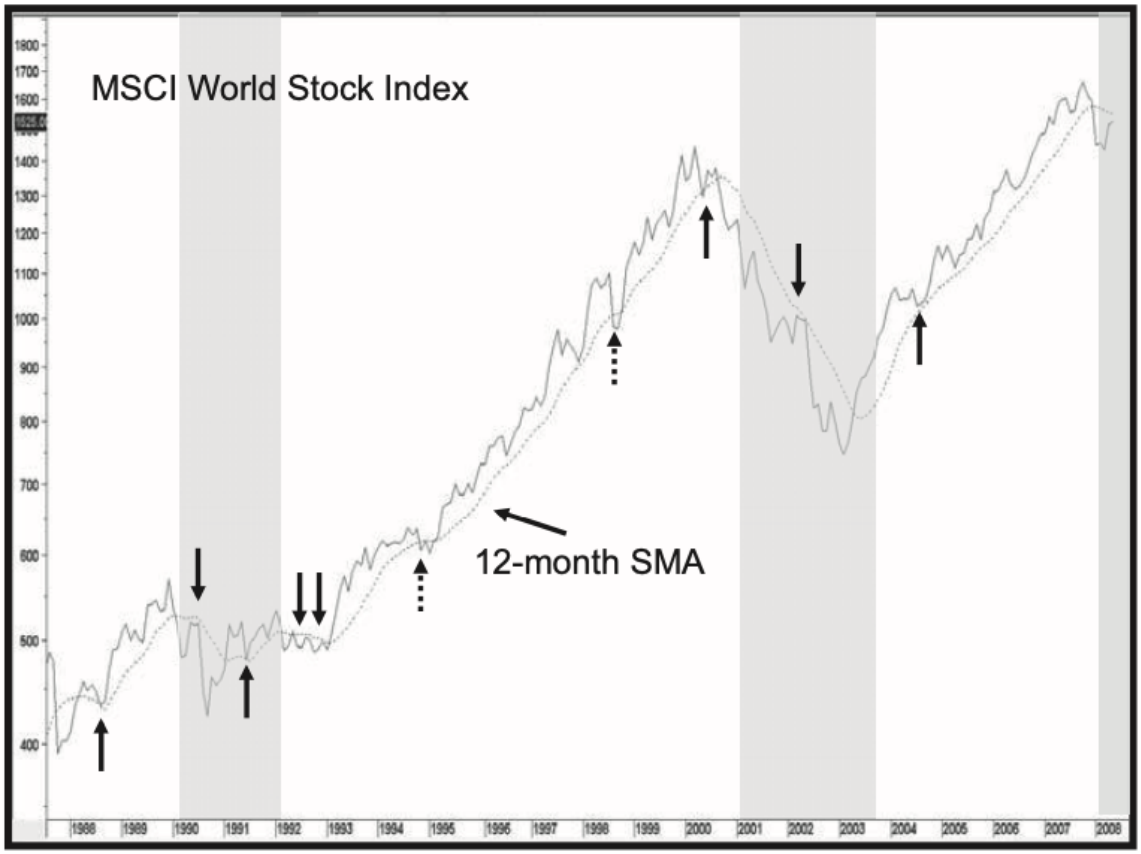


Figure 4: MSCIWorldStockIndex1987–200812-MonthMA. Source: Pring, 2014, p.230

MA crossovers can produce false signals like other entry signals in any trading strategy. Therefore, it's always good to have additional "supporting" signals besides the crossover. In the case of a crossover, one can also look for trendline crossovers.

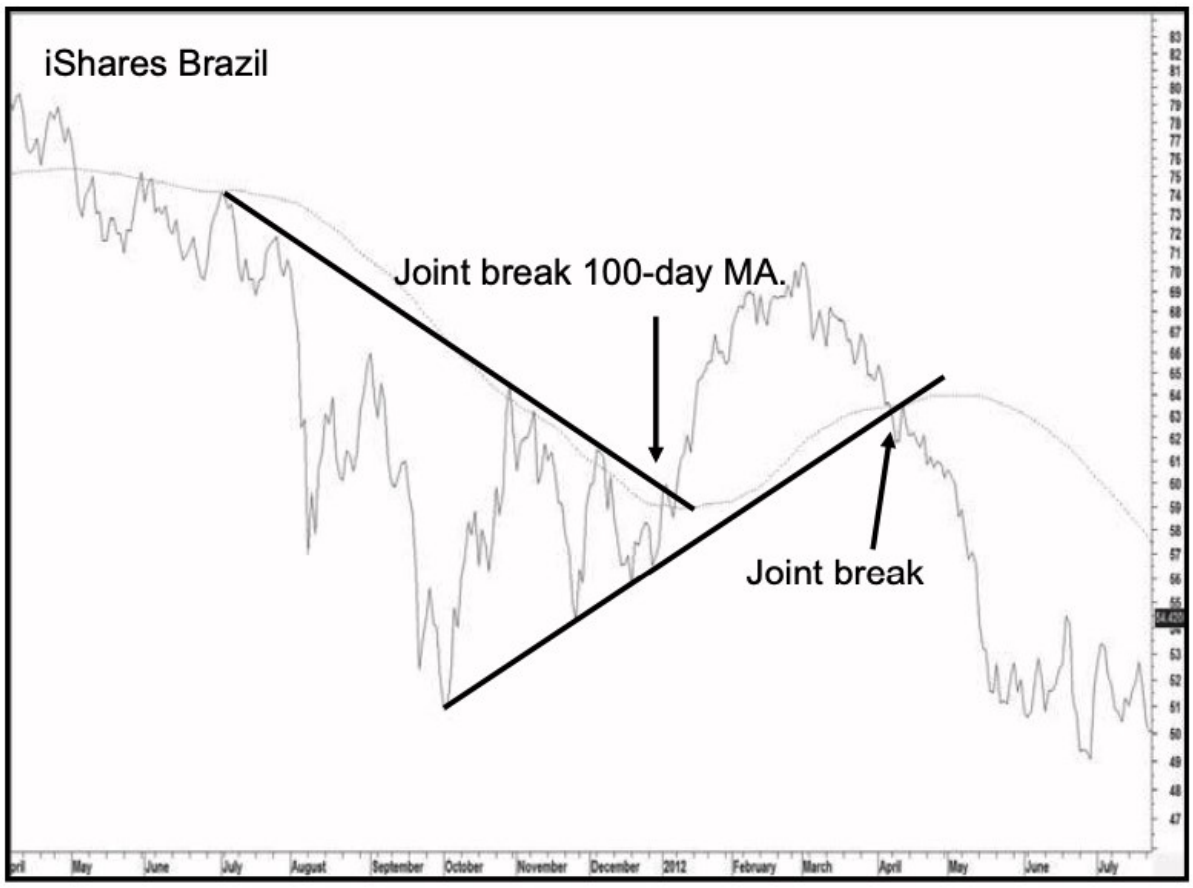


Figure 5: iShares Brazil 2011–2012 Joint Trendline/MA Violations. Source: Pring, 2014, p.214

"Major Technical Principle: If an MA crossover takes place at the same time a trendline is violated or a price pattern is completed, these signals strongly reinforce each other and, therefore, need less in the form of a filter requirement." (Pring, 2014, p.214)

Another useful property of moving averages is that they closely resemble trends and essentially help in determining the prevailing trend. This works as follows: if the price of an asset is below the moving average, it indicates a downtrend. Conversely, if the price is above the moving average, a bullish trend is prevailing. (Devcic, 2021)

This also depends on the period length. Various popular trend lengths exist, such as the commonly used 50-day, 100-day, and 200-day moving averages. Here's an example of how it works: *"A 50-day moving average is calculated by taking the closing prices for the last 50 days of any security and adding them together. The result from the addition calculation is then divided by the number of periods (50)."* (Devcic, 2021.)

1.2.4 Relative strength index (RSI)

The next indicator we will discuss, which is equally well-known, is called the **Relative Strength Index (RSI).** This indicator falls under the category of oscillators.

"Oscillators are chart indicators that can assist a trader in determining overbought or oversold conditions in ranging (non-trending) markets." (An Introduction to Oscillators, 2022).

In our case: *"**RSI** measures the speed and magnitude of a security's recent price changes to evaluate overvalued or undervalued conditions in the price of that security."* (Fernando, 2024)

As Schlotmann, Czubatinski (2019, p. 90) say: *"The RSI compares the average profit and average loss."*

The essence of this indicator is as follows (in this case, an RSI indicator with a length of 14 periods): *"It analyses how many of the last 14 candlesticks have risen and how many have fallen and also compares their sizes."* (Schlotmann, Czubatinski, 2019, p. 90)

Here's an example of how it works: *"if all 14 past candlesticks have risen, then the RSI would indicate a value of 100."* (Schlotmann, Czubatinski, 2019, p. 90)

Another example: *"If we consider a scenario in which half of the candlesticks have risen and the other half has fallen and the candlesticks have nearly the same size, the RSI would show a value of 50."* (Schlotmann, Czubatinski, 2019, p. 90)

Figure 6: The RSI can be used during trend and sideways phases. Source: Schlotmann, Czubatinski, 2019, p. 92

In summarizing the interim results, this indicator possesses a property that may further assist us in developing our trading strategy. Specifically, this property indicates whether an asset is overbought or oversold. That is, this indicator can signal to us that, at some point, it might be better to exit a position or, conversely, to enter one.

The following property of this indicator is called Divergence. *"Unlike the overbought and oversold signals, it can often indicate a real trend reversal precisely."* (Schlotmann, Czubatinski, 2019, p. 94)

This is how it works*: "The divergence shows a signal wherein the price and the indicator do not match (diverge). A divergence occurs when the price reaches a new high during an uptrend trend, but the RSI creates a lower high."* (Schlotmann, Czubatinski, 2019, p. 94)

Figure 7: RSI divergences may indicate a change in the trend direction in advance as they indicate decreasing momentum. Source: Schlotmann, Czubatinski, 2019, p. 95

In the chart on the left, one can see that while the asset's price is rising, the RSI indicator signals that the wave of this final bullish trend is not as strong as before. As a result, the price reverses, and the global trend shifts to bearish. In other words, the indicator has "predicted" the upcoming reversal of the asset. The opposite situation can be observed on the right, where a descending (bearish trend) is seen along with the formation of a divergence (in this case, a bullish divergence on the RSI indicator chart), and subsequently, the price chart again reverses, and the trend shifts to ascending.

1.2.5 Volume

Let's start with the definition of volume in trading: *"Volume is the number of shares or contracts traded over a specified period"* (Kirkpatrick II, Dahlquist, 2015, p. 411)

Epstein, Roze (2023, p. 134) specifie that the volume *"during the given time period represented by each bar."*

For example, *"on a daily chart, trading volume shows the total number of shares traded throughout the day."* (Epstein, Roze, 2022, p. 134)

Figure 8: A daily chart shows price and volume. Source: Epstein, Roze, 2023, p. 134

Epstein, Roze (2023, p. 135) unveil the following explanation for the fundamental operation of volume: *"Because volume effectively signals demand, low-volume price changes are less meaningful, from a technical perspective, than high-volume changes."*

They also add that: "Volume confirms price." (Epstein, Roze, 2023, p. 135)

And present a straightforward example: *"Would you want to buy a stock that 10,000 traders are bullish about, or would you prefer a stock that 10 million traders are bullish about?"* (Epstein, Roze, 2023, p. 135)

Kirkpatrick II, Dahlquist (2015, p. 415) mention another valuable property of this indicator: *"Price change on high volume tends to occur in the direction of the trend, and price change on low volume tends to occur on corrective price moves."*

For example, it can be seen that property of volume during the breakouts: *"High volume on a gap or on a breakout from a preexisting chart pattern is usually the sign of a valid breakout… many analysts use a spike in volume as a confirmation of the breakout…"* (Kirkpatrick II, Dahlquist, 2015, p. 425)

Aziz (2022, ebook) confirms it: *"Volume is usually increasing with the direction of price action and is at its maximum at the point of reversal."*

Schabacker (2021, p. 41) also emphasizes the importance of using volume to construct a comprehensive picture before initiating a trade: *"volume is quite as important as price movement in making up our complete picture of the trading record."*

In conclusion, the experts' opinion is unequivocal: using volume is a critically important element in trading. This indicator provides valuable insights into market trends. Price movements with high volume typically signal the continuation of a trend, while movements with low volume are often associated with corrective actions. Volume confirms the strength of price changes and serves as a vital tool for traders to confirm breakouts or anticipate reversals. Therefore, the correct interpretation of volume can be a decisive factor in the success of trading strategies.

1.2.6 Chart patterns

In this section, I will explore most widely used chart patterns.

Chart patterns are often used as a signal of shifts between upward (bullish) and downward (bearish) price trends. A chart pattern represents an identifiable configuration of price movement, discerned through a sequence of trendlines and curves. When a price pattern signals an impending change in the trend direction, it is called a reversal pattern. Conversely, a continuation pattern emerges when the prevailing trend is expected to resume after a brief consolidation period (Hayes, 2024.)

Lawrence Chan (2018, p.100) also speaks about the usefulness of chart patterns: *"Chart patterns certainly can help you predict what the market is likely to do. They can—and should—be a core component of your profitable trading strategy."*

A wide variety of different chart patterns exists. Next, we will examine the most frequently used ones.

Double top (bearish) & Double Bottom (bullish)

Double bottom signifies a bullish trend reversal, whereas **double top** signifies a bearish trend reversal.

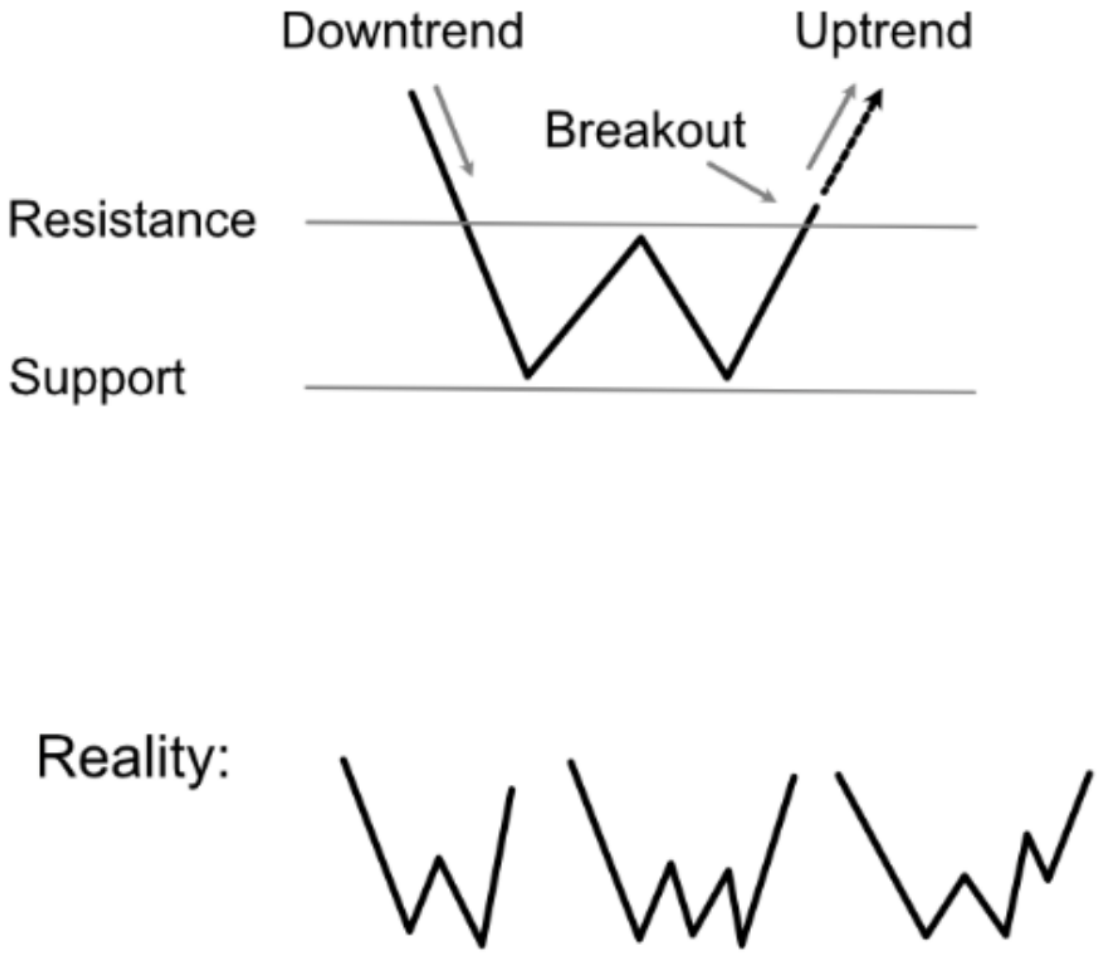


Figure 9: Double Bottom. Source: Vaida, 2023, P. 64

Here's what determines the operation of this pattern.: *"The price hit a strong support area and bounced from it and then it hit it again, bouncing from it again. This signifies strong support and strong price reactions in that area."* (Vaida, 2023, P. 64)

The same can be said about double top, but in reverse. The same logic applies here.

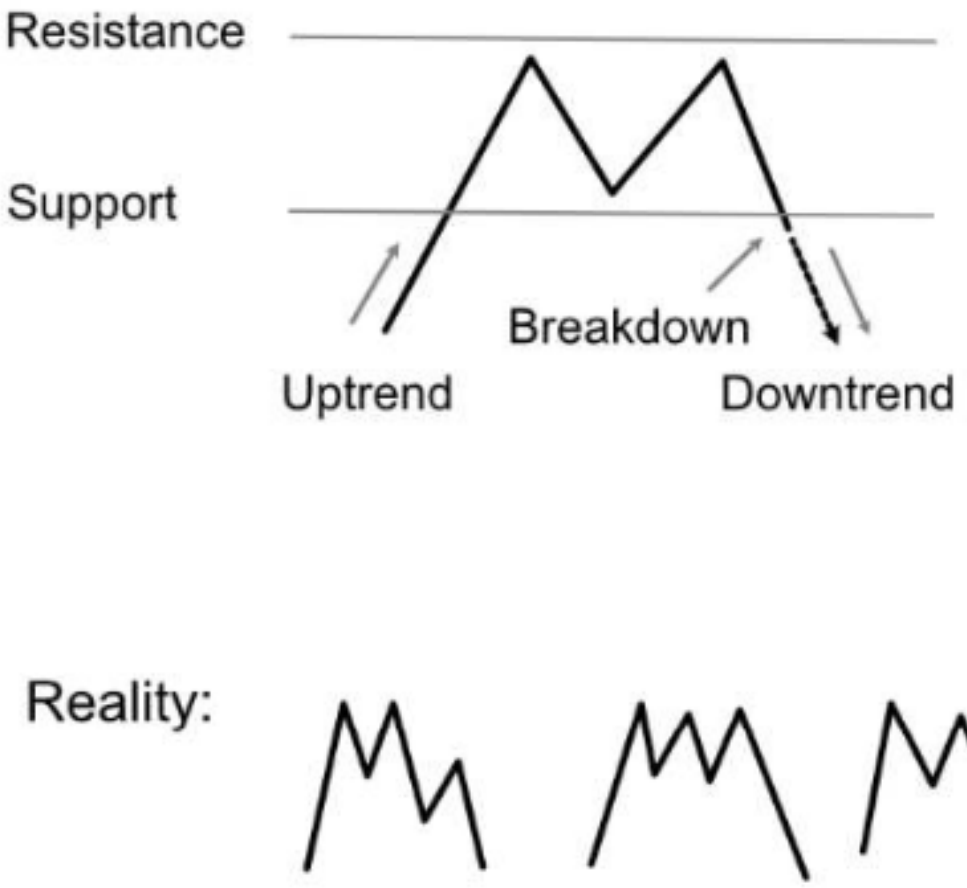


Figure 10: Double Top. Source: Vaida, 2023, P. 65

Conditions: a double top occurs following a price increase where the price tests a resistance area and is rejected. Upon testing this level again and facing another rejection, a second top is formed, sometimes even a third, signaling a strong resistance. The pattern is confirmed when the price breaks down below the support line, which could potentially be retested.

In contrast, a double bottom pattern emerges after a price decline. This pattern is characterized by the price testing a support area and being rejected. If the price tests the support again and is once more rejected, it establishes a second bottom and occasionally even a third, indicating durable support. The pattern is validated when the price breaks above the resistance line, which, like the double top, may be retested, implying a reversal of the downtrend (Vaida, 2023, p. 64-65).

Head and Shoulders (bearish) & Inverse Head and Shoulders (bullish)

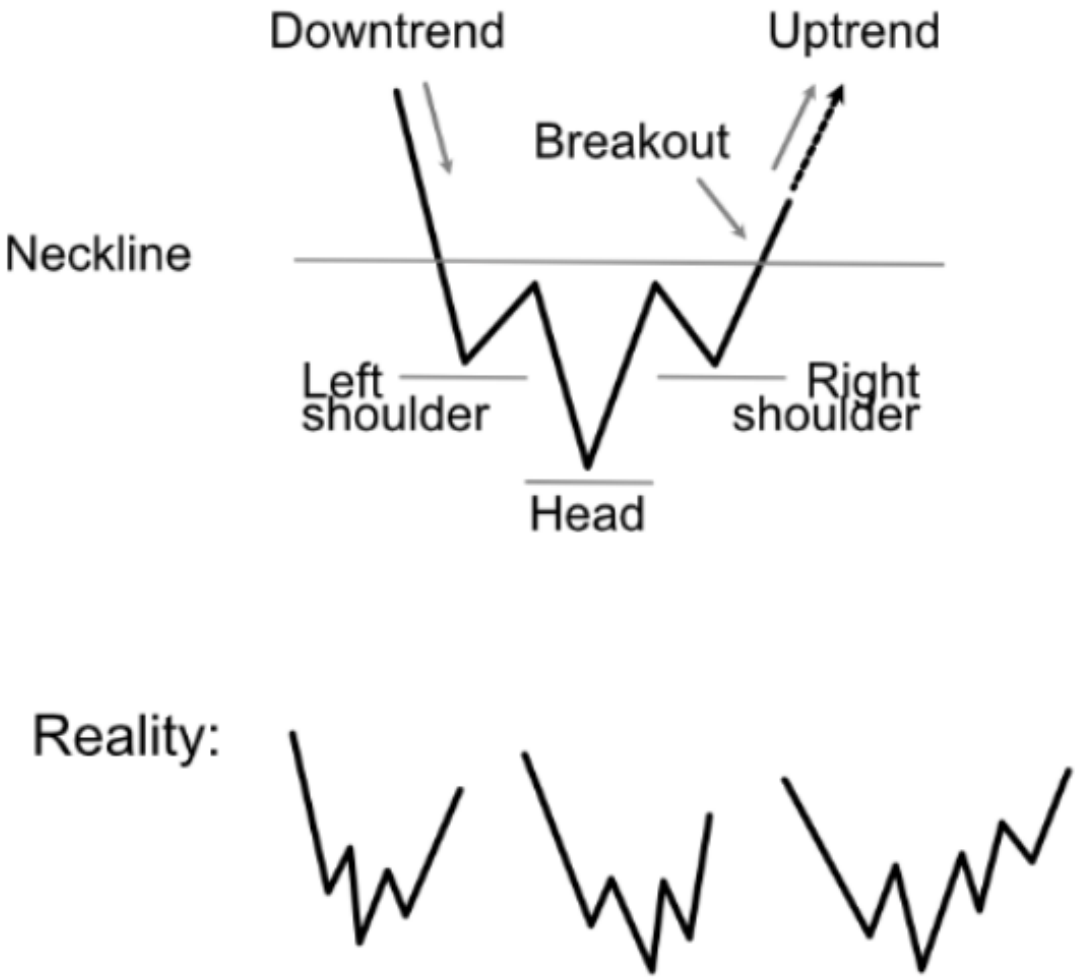


Figure 11: iH&S. Source: Vaida, 2023, P. 66

"The Inverse Head and Shoulders (iH&S) pattern is a bullish chart pattern in technical analysis that signals a potential trend reversal from a downtrend to an uptrend." (Vaida, 2023, P. 65)

Entry condition is: *"The pattern is confirmed when the price breaks above the neckline, a resistance level connecting the highs between the shoulders and the head, after the formation of the right shoulder."* (Vaida, 2023, P. 65)

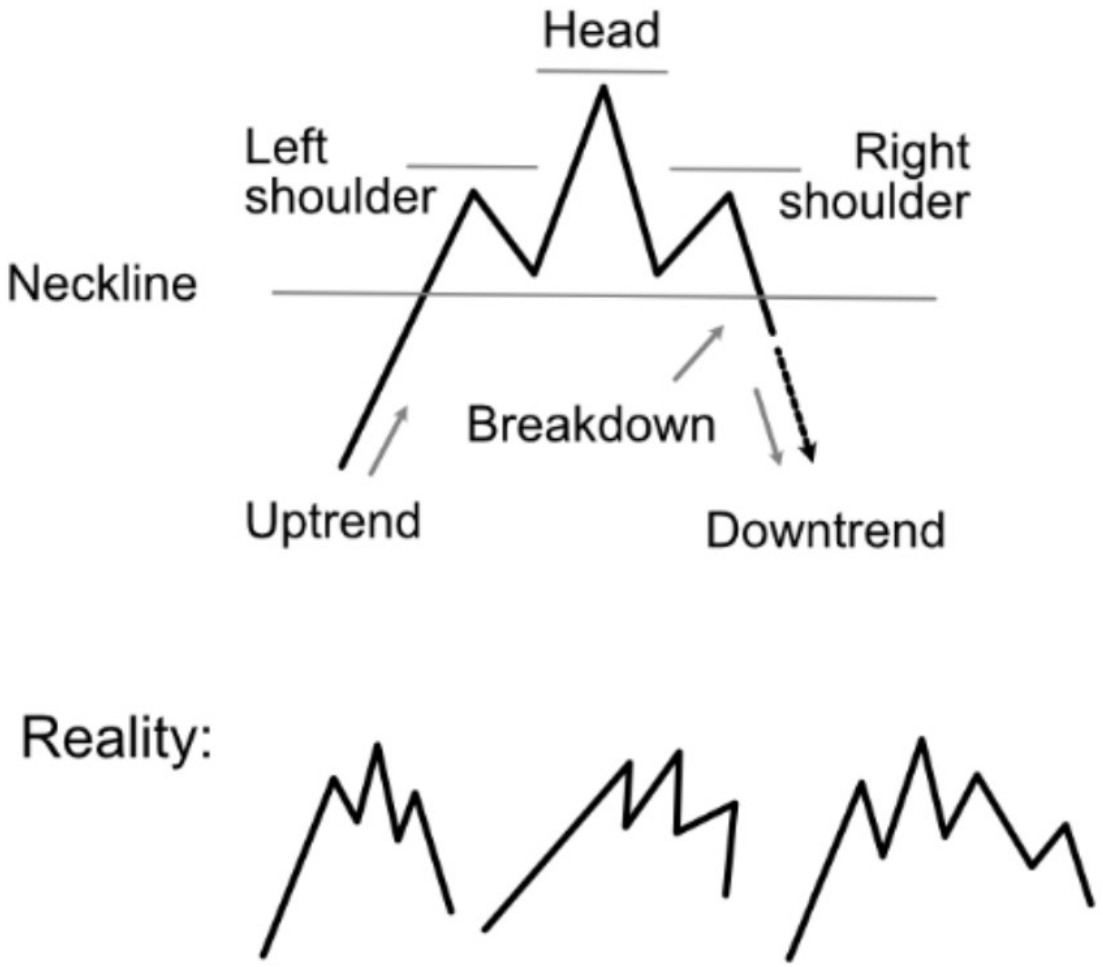


Figure 12: H&S. Source: Vaida, 2023, P. 67

Again, absolutely the same, but in reverse can be said about the head and shoulders pattern. In this case, the entry point would also be when breaking through the neckline level with the right shoulder from the top down (in this case, the neckline acts as a support level, not a resistance level).

Vaida (2023, p. 67) provides the conditions for the **head and shoulders** and its **inverse** pattern in trading. According to the author, these patterns typically emerge after a market incline or decline. A resistance area is tested for the head and shoulders, forming the left shoulder, and upon rejection, a higher peak forms the head - a subsequent attempt to retest the initial resistance results in the right shoulder, which is similarly rejected. The pattern completes with a downward break through the support line, known as the neckline, which may be retested.

Conversely, the inverse head and shoulders pattern manifests after a price decline. Here, a support area is tested to form the left shoulder, followed by a dip forming the head, and

another rejection at the initial support creates the right shoulder. Completion of this pattern is marked by an upward break through the resistance line, again potentially retesting it. These patterns suggest a likely continuation of the prevailing trend following the breakout.

Bull flag (bullish) & Bear flag (bearish)

A **Bull flag** indicates a continuation of a bullish uptrend, and a **Bear flag** indicates a continuation of a bearish downtrend.

"These patterns signify trend continuation. On higher time frames, it appears as a bullish trend accompanied by one or two bearish candles, after which the trend persists. On lower time frames, these candles create a parallel channel." (Vaida, 2023, P. 68)

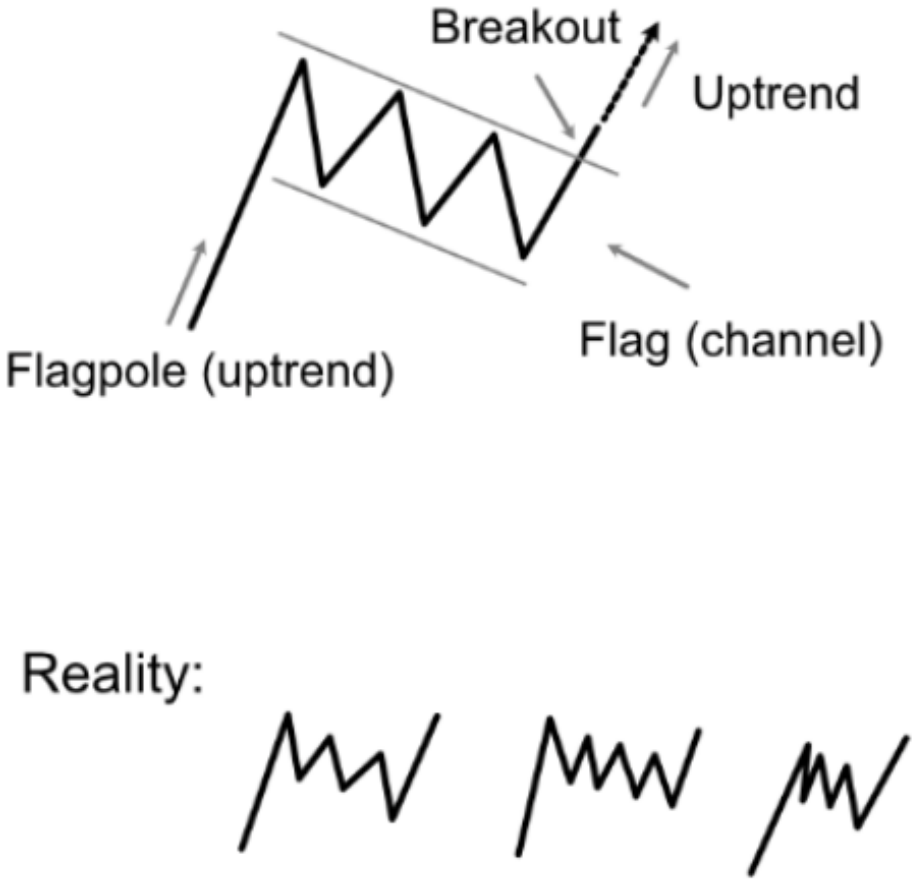


Figure 13: Bull Flag. Source: Vaida, 2023, P. 68

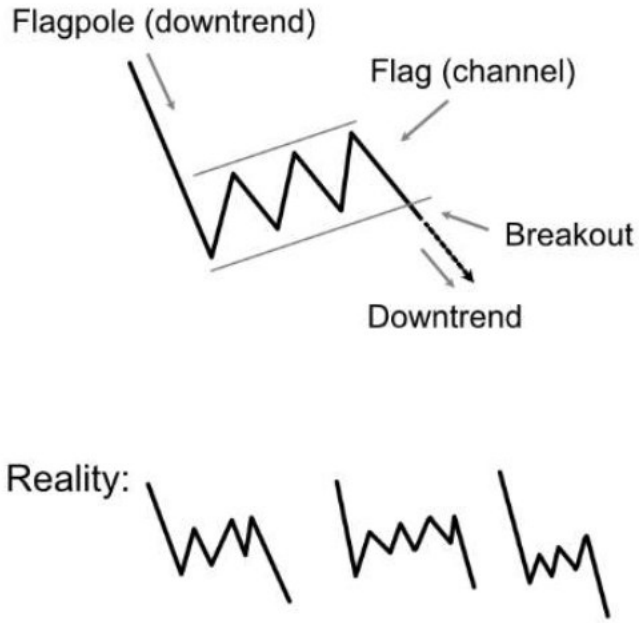


Figure 14: Bear Flag. Source: Vaida, 2023, P. 68

Conditions: occur after a price incline/decline. Price consolidates in an upward/downward slope, following parallel diagonal support and resistance lines. Price breaks the support or resistance line. (Vaida, 2023, P. 68)

Let's proceed to the next group of chart patterns: **Descending, ascending, symmetrical, and expanding triangles.**

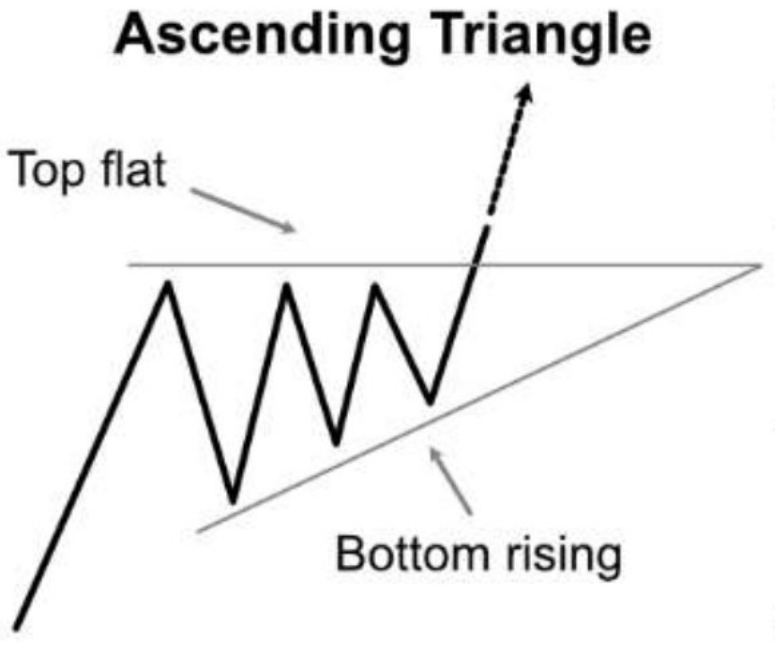


Figure 15: Triangles. Source: Vaida 2023, P. 71

According to Vaida (2023, p. 70), when the price ascends and repeatedly tests a strong resistance level from progressively higher lows, this price formation is termed an **ascending triangle**. This pattern suggests that while the resistance holds firm initially, the successive bounce areas inch closer, building upward momentum until an eventual upside breakout occurs.

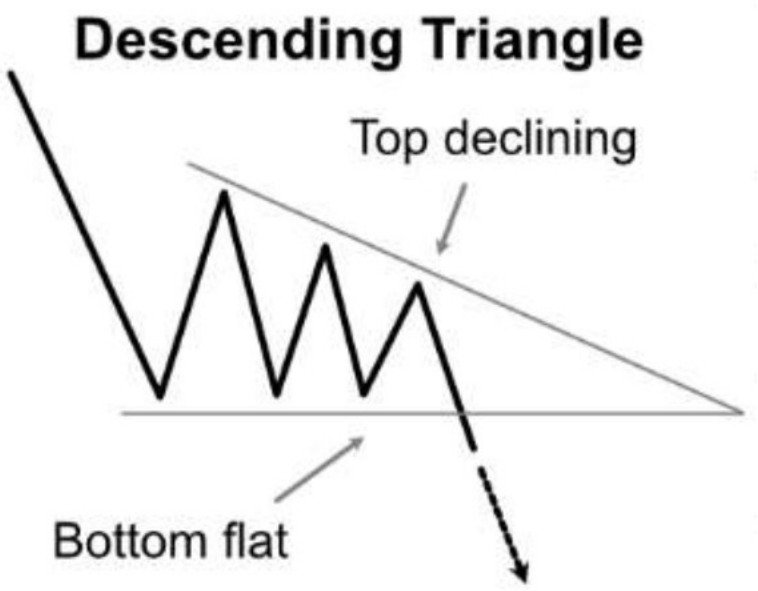


Figure 16: Triangles. Source: Vaida 2023, P. 71

Conversely, a **descending triangle** manifests when declining prices repetitively find support at a common low, with each bounce failing marginally higher until the support finally gives way to resume the prevailing downtrend.

Conditions for **ascending** and **descending triangles**: *"price keeps hitting a resistance (or support) area while the other side gets closer to the convergence of the triangle. Then it breaks out of the triangle on that resistance (or support line), sometimes retesting it."* (Vaida 2023, P. 71).

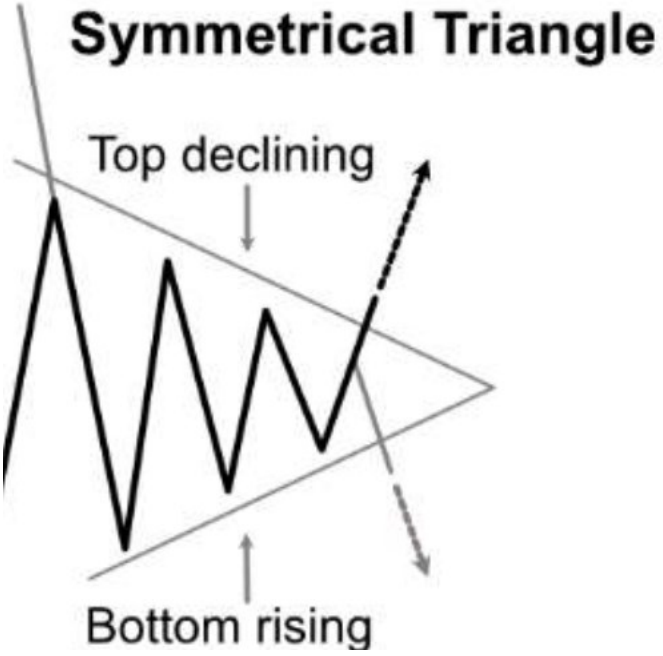


Figure 17: Triangles. Source: Vaida 2023, P. 71

A **symmetrical triangle** tends to resolve toward the preceding price trend with relatively less momentum than ascending or descending triangles.

Conditions for a **symmetrical triangle are the same as those for** ascending and descending triangles. Still, the price should make lower highs and higher lows (that would indicate indecision or consolidation). Afterward, it breaks out on either side of the triangle. (Vaida 2023, P. 71).

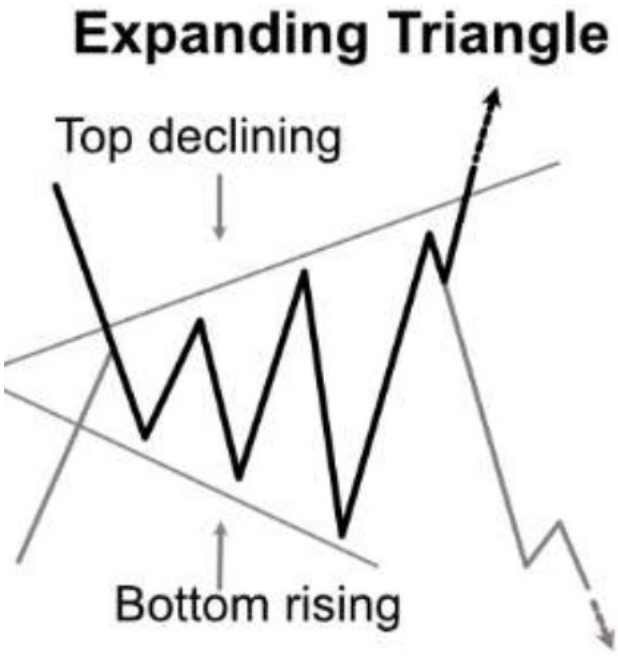


Figure 18: Triangles. Source: Vaida 2023, P. 71

Vaida also describes an **expanding triangle** as an inverse pattern where, instead of a pullback and continuation, each successive high is met with a more pronounced sell-off until a trend reversal becomes apparent. Specifically, in a bearish expanding triangle, the more the price attempts to rally, the more aggressively it is rejected lower - until it eventually breaks down decisively. (Vaida 2023, P. 71)
Conditions for an **expanding triangle:** price should move between the diverging trend lines, making higher highs and lower lows. Then the price breaks out on either side, usually on the side it came from. (Vaida 2023, P. 71)

In other words, this group of patterns can be identified as patterns that follow the trend. They "predict" that the existing trend, whether bullish or bearish, is more likely to continue its movement in the direction of the trend rather than the opposite after forming these patterns.

1.3 Key principles of trading strategies and their applicability in different market conditions

After I've delved into various fundamental aspects of technical analysis, such as chart patterns, indicators, trends, support, and resistance levels, it's time to understand which key principles of developing our strategy need to be determined. Understanding these principles is crucial for effectively applying our technical analysis knowledge to develop our strategy later.

1.3.1 Entry rules

To complete a trade, it first needs to be opened. For this, identifying a suitable entry point is crucial. The right entry point can play a decisive role in the transaction's success.

"The discipline to wait for the right entry, combined with the knowledge of past price behavior, will set you apart from the majority of traders. They are unlikely to have done the same level of preparation." (Hougaard. 2022, p.120)

Now that the importance of not thoughtlessly entering a transaction but rather at the right time and with the correct entry point has been established, it's crucial to understand how to identify the entry point for our deal. It becomes evident how this principle interlocks with the various trading strategies discussed earlier. Each trading strategy, whether trend analysis, support & resistance levels, moving averages, relative strength index (RSI), or chart patterns, serves as a foundation for identifying potential entry points. Using these techniques, traders can increase their proficiency in technical analysis.

1.3.2 Exit rules (take-profit and stop-loss)

Following the importance of establishing an entry point for our trade, it's also necessary to work out how I will exit the trade. Unlike our entry point, the exit point of our position can serve us as both so-called **take-profit** and **stop-loss**. In the case of a **take-profit**, our position would be closed with profit after reaching some target price (our desired result). In case of a **stop-loss**, I am closing the position in loss to limit potential losses. A successful trading strategy should always include both a take-profit and a stop-loss. This underlines that successful trading requires determining good levels for entering the position and a strategic approach for determining price levels for an exit.

Professional traders often approach setting a **stop-loss** with simplicity, placing it below a previous low in a long trade or above a previous high in a short trade. This method is effective because breaking these swings often serves as the first indicator of a trend change. (How to Identify Entry and Exit Points in Intraday Trading, 2022)

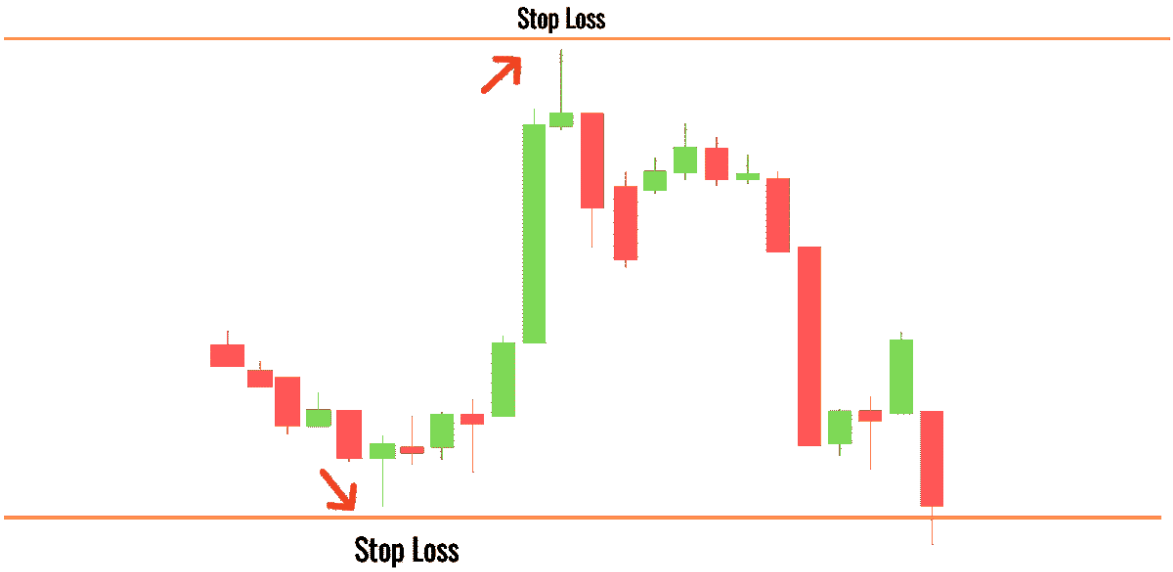


Figure 19: Where to Place Your Stop Loss on Pin Bar Trades. Source: Trading Pin Bars for Sats & Pips, 2020

"When you set your stop loss, you want to have a "barrier" working in your favor to prevent the price from moving against you. These "barriers" can be things like support and resistance, swing highs and lows, trendlines, etc." (Teo, 2021, p. 69)

Additionally, to determine the moment to lock in profits (**take-profit**), traders may decide on a risk-to-reward ratio (RRR) to calculate their exit price. Intraday traders, for example, commonly prefer an RRR of 1:1. This means the distance from the entry point to the take-

profit is equal to the distance to the stop-loss, ensuring a balanced potential profit and loss ratio. (How to Identify Entry and Exit Points in Intraday Trading, 2022)

By integrating approaches to setting take-profits and stop-losses in the trading strategy, traders can increase their success rate and gradually decrease their risk exposure.

Epstein, Roze (2023, p.9) emphasize the importance of establishing and strictly following stop-loss points for each trade. This disciplined approach allows traders to manage risks effectively, acknowledging that it's better to exit a position and accept being wrong rather than jeopardize the entire portfolio. It's highlighted that there's always an opportunity to re-enter the market when the trends become favorable again, suggesting a strategic and flexible approach to trading.

This confirms that a profitable trading strategy requires proper risk management, which we will discuss later.

Understanding the dynamics of exiting a trade is crucial for maximizing profits and minimizing losses. Sometimes, it will be prudent to close the trade earlier than planned, for example, when the price action is not as expected or when there are signs/indications of a trend reversal in an unwanted direction.

As stated: *"Getting out at the right time isn't difficult, but it does require close observation of price action, looking for clues that may predict a large-scale reversal or trend change."* Closely monitoring price action and signs of trend reversal can help exit a trade timely and avoid potential losses. (Farley, 2022)

Furthermore, it is worth paying attention to factors such as market momentum, trade volume, and news event impact: "*If the trend is strong and in the trader's favor, it may be advantageous to let the trade run… If momentum is waning or showing signs of a reversal, closing the position to protect gains or limit losses becomes prudent."* This statement again underlines that analyzing market dynamics can provide valuable insights into the optimal timing for closing a trade.

It is alss recommended monitoring "failed price swings," noting that *"if the market fails to follow a certain pattern or price swings do not align with the analysis, it could signal to reconsider the trade."*

Observing trade volume can provide valuable insights into the right time to close a trade, as *"low trade volumes may indicate reduced market interest and liquidity, potentially impacting price movements"* (Maunsell)

In summary, it can be surely said that in determining the choice of the exit point, it is important not only to plan in advance the levels at which, upon their achievement of the price, it will be time to close the trade but also it would not hurt to monitor the current state of the asset. And if things start to appear on the chart indicating that the optimal solution would be to close the deal, then it is better to exit the trade prematurely.

1.3.3 Time frames

In the context of trading, the concept of **time frame** is understood as the length of time each candlestick on a chart represents, varying according to the specific preferences of traders. Their trading strategies and objectives significantly influence this choice. As such, selecting an appropriate timeframe is a crucial decision that aligns with a trader's style and aims, highlighting the diversity of approaches within the trading community. (Peramuna, 2023)

Pring (2014, p.3) points out that the ideas behind technical analysis work for any chart time frame, whether it's as short as 1-minute (1m) or 15-minute (15m) chart, or longer like a 1-day (D), 1-week (W), and 1-month (M). This means the techniques you learn can be used whether you're looking at quick changes during the day or trends over many weeks.

"The interpretation is identical. The only difference is that the battle between buyers and sellers is much larger on the monthly charts than on the intraday ones." (Pring 2014, p.3)

Hougaard (2022, p. 76) further illustrates this point with a striking observation: *"If you strip away the time and price axis of a chart, you will likely be unable to differentiate between a five-minute chart and an hourly chart."*

Following Hougaard's observation on the indistinguishable nature of chart patterns across different time frames, Teo (2021, p.93) brings a practical consideration into the mix. It is about the timeframe one should choose for the trading strategy. He notes that it entirely depends on the amount one spends on trading a day. Teo advises that if you have plenty of time to trade, you might work with shorter time frames, but if you're busy with a job, you should look at longer, daily or weekly charts for trading. This makes it easier to fit trading into the schedule.

1.3.4 Market conditions (volatility)

In addition to defining entry and exit rules, as well as selecting various timeframes, it is also necessary to consider market volatility and adapt the strategy to current market conditions. This can play a vital role in the success of a particular trade. For example, if the market is too volatile, it may be advisable to refrain from entering a position altogether, as the trader's trading strategy may not yield the expected results. As Wade, Simeri (2022, p.62) note, *"Volatility is a measure of price changes over time, averaged over a certain period."* He emphasizes that volatility reflects the degree of "excitement" among the market mass of participants affecting price formation.

High volatility may indicate an unstable and uncertain market phase when *"the group of market participants is highly active and excited"* (Wade, Simeri, 2022, p.61). Trading may be risky during such periods, and the prudence of entering a position should be carefully analyzed.

Wade, Simeri (2022, p.66) underline the importance of analyzing current volatility to adjust trading operations and also warns against opening positions during moments of turbulence, as it is the "final part of the trend." (Wade, Simeri, 2022, p.67)

Moderate volatility may indicate that the market is currently experiencing a calmer and more predictable phase when the group of market participants is relatively less active. In these conditions, it may be reasonable to apply the developed trading strategies.

In summary, by analyzing the current market stage, its conditions, and volatility, a decision can be made as to whether to apply the trading strategy in the current market. This is an essential factor for successful trading. As Wade and Simeri note, *"we should regulate our operation according to the current phase [of the market]"* (Wade, Simeri, 2022, p.61).

1.4 Risk management

Previously, I have covered many important aspects of developing our trading strategy. However, risk management is arguably the most critical among them, and its importance cannot be overstated. Regardless of how effective a trading strategy may be, without proper risk management, a single loss can potentially wipe out substantial earnings and may even result in losses that surpass the initial investment. It is an essential element in safeguarding a trader's capital.

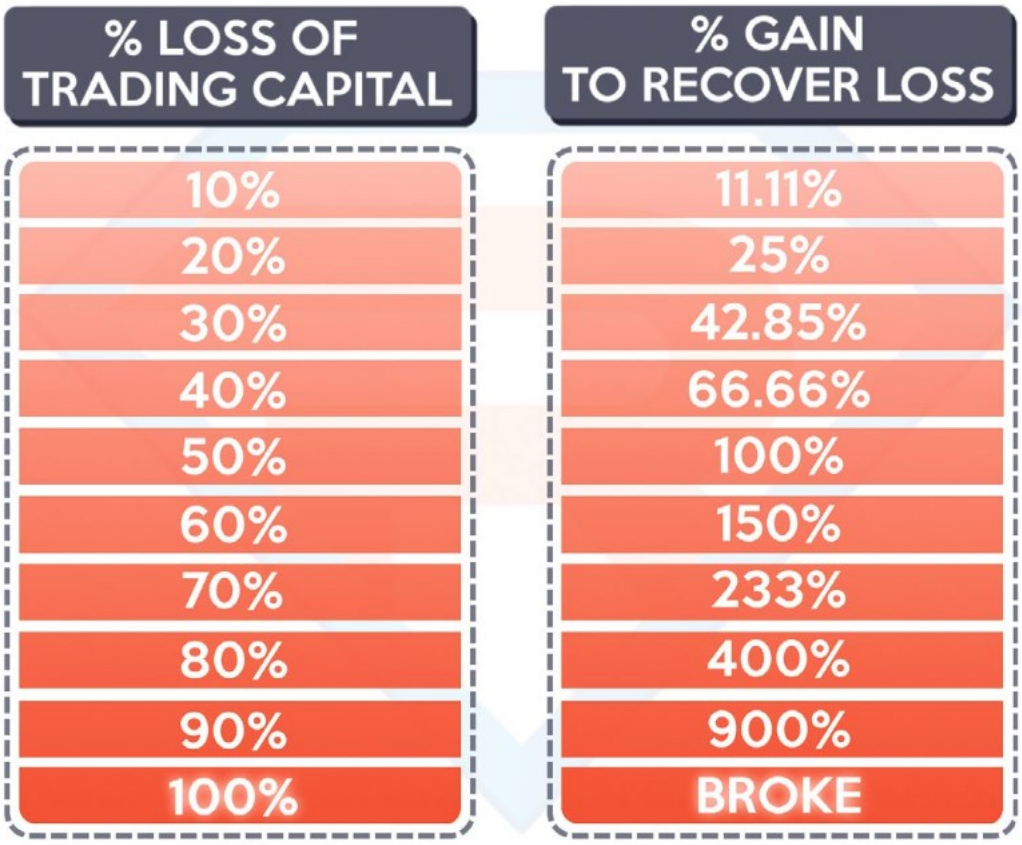


Figure 20: RISK MANAGEMENT: HOW TO CALCULATE POSITION SIZE (FOREX). Source: Teo, 2021, p. 71

The Figure 20 effectively illustrates a fundamental principle of risk management: the disproportionate relationship between capital loss and the amount of initial capital required to recover it. As shown, a modest 10% loss of trading capital requires an 11.11% gain to recover, but as losses compound, the effort to recover increases exponentially. For example, a 50% loss necessitates a 100% gain to break even. This underscores my words about the importance of preserving capital with strict risk management, as the greater the loss, the more difficult it becomes to return to the original capital amount. Basically, we can say that preventing losses is often more critical than generating gains since the road to recovery is significantly "steeper" and more challenging after substantial losses.

As a general guideline, most sources recommend risking not more than 1% of the trading portfolio per 1 trade. Teo (2021, p. 71) explicitly recommends that traders should not risk more than 1% of their capital on each trade: *"That's why you want to risk a fraction of your capital on every trade (my suggestion is not more than 1%)."*

Building on this, Millier (2022, p. 154) advises that the threshold may be extended to 2% for seasoned traders, underlining that this level of risk should only be taken by those with a

substantial track record of success: *"As a rule of thumb, you shouldn't risk more than 2% in any individual trade. And this 2% threshold is for experienced traders only."*

For novice traders, the recommendation is to adhere to the 1% rule until there is a consistent track record of successful trades, such as tripling the trading equity, before considering any increase in risk exposure: *"If you are a newbie trader, stick to 1% until you are successful with your trades (i.e tripling your trading equity) before thinking of increasing your risk exposure."* (Miller, 2022, p. 154)

Lebron (2019, p. 52) also warns us about the inherent uncertainty in financial markets. He reminds us that, despite our best efforts to plan and mitigate risks, the markets can still surprise us with unforeseen events. Lebron (2019, p. 52) points out that there are always risks beyond our control, emphasizing that *"random, weird things happen periodically in financial markets, and some of those will catch you unaware."* This statement reminds us that good risk management isn't just about planning for what is expected. It also means being ready for the unforeseen things that the markets can do things that couldn't be predicted.

The principle of limiting risk to 1% of the portfolio per trade underscores the importance of a dynamic risk management strategy.

1.5 Essential components for developing your own trading strategy

Having explored the most commonly used trading strategies, including trends, resistance and support levels, moving averages, RSI, and volume, and the key principles of various trading strategies, it's time to finally determine what is needed to create and develop your own trading strategy.

A balance must be found between ambitions and potential risks to develop a robust trading strategy. *"It is not easy to develop a tradeable strategy because there are serious pitfalls... Most of us are greedy and want to trade something that has a large return... the first pitfall is greed"* (Fitschen, 2013, p. 7). This highlights the need to set realistic risk/reward goals.

Testing (or backtesting) is also essential at the stage of developing your trading strategy. A back-tested trading strategy is the foundation of effective trading. Kirkpatrick II, Dahlquist (2015, p. 529) detail this: "*Haphazardly investing or trading on intuition, rumor, or untested theories is a road to disaster."* This underscores the need for an analytical and methodical approach to strategy development. *"Most systems fail because they have not been tested or have been overfitted (curve-fitted),"* warn Kirkpatrick II, Dahlquist (2015, p. 533). Thorough

backtesting on historical data is crucial to identify potential flaws and avoid overfitting the system to past performance. Realistic expectations should be set, as Kirkpatrick II, Dahlquist (2015, p. 532) advise, *"You should generally expect half the profits and twice the drawdowns as shown in tests of past data."*

Discipline in following your strategy is undoubtedly an essential factor; as Kirkpatrick II, Dahlquist (2015, p. 532) caution, *"Remember that the system falls apart if it is not followed precisely."* But it is also worth noting that timely adaptation of the strategy to changing market conditions is also a necessary aspect, *as "a good system adjusts to a changing market, [but] it does require periodic updates"* (2015, p. 532). Maintaining a balance between discipline and adaptability is critical to being successful in trading.

The implementation of systematic rules is a critically important aspect. As Kirkpatrick II and Dahlquist (2015, p. 529) explain, the strategy must include *"not only the method for profit but also the means of controlling the risk of loss,"* emphasizing the dual focus on gains and safeguarding capital (risk management, which we talked about earlier). While all risks cannot be anticipated, an effective risk management strategy must be flexible to adapt to changing conditions.

In summary, the most significant essentials to consider in developing your strategy are market knowledge, a disciplined risk management framework, and the determination to follow a well-tested system. Each of these elements will be an integral part of a trading strategy that should be data-driven, disciplined, capable of withstanding market fluctuations, and aligning with the personal risk thresholds.

2 DIGITAL ASSETS TRADING

2.1 Definition and overview of different types of digital assets

2.1.1 Overview

The term "digital assets" began to gain popularity relatively recently, especially considering that, in one form or another, "assets" have existed in our world since ancient times. Thanks to technological developments, many things are becoming digitized. This has touched various assets as well. So, what are these, and what types of assets are there? Digital assets are a fairly broad concept that does not have a clear definition. Everyone interprets this concept in their own way and slightly differently. But despite the fact that opinions on what specifically is meant by digital assets vary, let's try to formulate a definition.

Stabile, Prior, and Hinkes (2020, p. 25) offer the following definition: *"Digital assets are assets that exist natively in digital form, and may include the digital representation of real life physically existent property."*

A slightly different definition, for example, is offered by Scharfman (2021, p. 12): *"Digital assets can most broadly be defined as anything that can be stored digitally."* In general, digital assets are broadly anything that can be stored digitally, which can be natively digital or digital representations of physical assets.

There is a large number of different types of digital assets. Digital assets include cryptocurrencies, digital tokens, NFTs, digital files, CBDC (Central Bank Digital Currencies), etc. The most common of these are cryptocurrencies. *"As we outlined earlier in this chapter cryptocurrencies are a subset of the larger category of digital assets."* (Scharfman, 2021, p. 12)

However, cryptocurrencies have not always been a behemoth in the field of digital assets. Before that, digital assets *"included content such as images, photos and text files. These can be referred to a content-related digital assets."* (Scharfman, 2021, p. 12)

Cryptocurrencies, in turn, are also divided into many different types. But let's return to this a little later.

2.1.2 CBDC

Now, the definition of digital assets primarily refers to cryptocurrencies and CBDC (Central Bank Digital Currencies) – another concept that has appeared relatively recently. The term

CBDC first appeared only in 2015 (even though the idea has been discussed before). (Zatti, Barresi, 2024, p. 3)

Zatti, Barresi (2024, p. 4) state their opinion on CBDCs and their properties, formulating that they are essentially liabilities of central banks on par with cash and reserves. That is, CBDC users have a direct claim against the central bank. Moreover, CBDCs are defined as fundamentally digital assets based on electronic ledger technology. Also, they must be issued in the national currency, which ensures their compliance with existing monetary systems. They are also intended to be used to make payments and be a store of value.

The question arises: why was it necessary to create CBDCs in the first place? Edelman (2022, p. 59) puts forward an interesting theory. He explains that digital money leaves a digital trail. Every transaction can be traced. *"While that might annoy privacy advocates, it downright panics criminals. This is why digital assets are here to stay: governments love 'em. And that's why every central bank in the world is investigating or developing CBDCs."* (Edelman 2022, p. 59)

Nowadays, governments of many countries have started actively researching CBDCs. Ozelli (2022, p. 36) states that *"about 80% of the 66 central banks surveyed by the BIS"* are already working on a CBDC.

For instance, Venezuela launched Petro, the first state-backed digital stablecoin, which is now required for fuel purchases. Sanctioned countries like North Korea, Iran, and Cuba are investing in technical capabilities to create their own CBDCs. The Bank of Lithuania is set to issue digital collector coins that can be exchanged for physical ones. Moreover, in China, companies like Starbucks, Subway, and McDonald's are testing stablecoins as part of a pilot by the People's Bank of China, which is also anticipated to introduce a digital yuan using Huawei's 5G for distribution. Russia is actively trialing its digital ruble and is part of a multinational digital currency initiative that includes BRICS nations—Brazil, India, China, South Africa—and Eurasian Economic Union countries. In Europe, the Banque de France leads with a successful trial of a digital euro on a blockchain platform. Ozelli (2022, p. 37)

In conclusion, the emergence of CBDCs (Central Bank Digital Currencies) is important in transforming the banking financial framework. It reflects a response to and a necessity for the digitization of the economy and improving payment systems. Extensive research and development of CBDCs underscore a global shift towards their inclusion in official financial

systems. It can be assumed that in the future, digital currencies will likely play a central role in both national and international trade.

2.1.3 Cryptocurrencies

Cryptocurrencies can be divided into several main groups. Next, we will examine some of the most common types.

Let's start with concepts such as **token** and **coin**. Although they are generally very similar, there are some differences between them.

*"**Coin** is typically used to describe the native asset used in a decentralized distributed public network system that uses cryptography to secure assets."* (Stabile, Prior, and Hinkes, 2020, p. 25)

As Stabile, Prior, and Hinkes further clarifie, coins are primarily used as a "friction instrument" in the blockchain network. They serve as a form of compensation, a reward for miners or validators for their work. Examples of coins include Bitcoin, Ether, and Litecoin.

***"Token** is an asset issued by an identifiable entity that uses another blockchain's blockchain and does not rely on its own blockchain."* (Stabile, Prior, and Hinkes, 2020, p. 25)

Stabile, Prior, and Hinkes further state that most tokens were created and continue to be created based on the Ethereum ERC-20 protocol, which is *"a token issuance standard which specified a number of minimum requirements for interoperability that facilitated the issuance of hundreds of thousands of new crypto instruments, all of which transacted on top of the Ethereum blockchain."* (Stabile, Prior, and Hinkes, 2020, p. 25)

An excellent example of tokens is stablecoins, such us USDT or USDC.

The next group worth mentioning is **NFTs**. *"**NFT** is a non-fungible token or provably scarce digital asset. NFTs are digital assets which represent a non-interchangeable or non-fungible item. These instruments are used as crypto collectibles, such as Cryptokitties,39 and for gaming applications."* (Stabile, Prior, and Hinkes, 2020, p. 25)

Next, there are "Security Tokens" or "Tokenized Securities." These are the tokens (or other instruments) that are *"offered under circumstances and with representations that result in the offer or sale of those tokens being considered to be offer or sale of securities under relevant applicable law."* (Stabile, Prior, and Hinkes, 2020, p. 25)

To complement the description of "**Security Tokens**" or "**Tokenized Securities**", it is also worth mentioning that the legal nature of these instruments typically depends strictly on the promises made to attract sales, according to the legislation of the jurisdiction, and not on the method of their issuance: *"the legal character of the instrument itself is generally a function of the promises made to induce sale applied to the law of the jurisdiction, not the form of issuance."* (Stabile, Prior, and Hinkes, 2020, p. 25)

In conclusion, it can be said that the world of cryptocurrencies is multifaceted and very diverse. Especially recently, it has begun to develop more and more rapidly. In the world of blockchain, more and more different coins, tokens, and NFTs, and generally, the environment around them is starting to appear. For example, currently, due to the development of cryptocurrencies, various protocols, applications, exchanges, etc., are also gaining popularity; in other words, everything that supports and facilitates working with cryptocurrencies.

2.2 Review and comparison of various trading platforms

Currently, there is a large number of cryptocurrency exchanges and trading platforms, both **centralized** (**CEX**) and **decentralized** (**DEX**). Both types of these exchanges have the same utility - exchange/trading of cryptocurrencies. However, there is a difference between them - operational structure and handling of users' funds.

2.2.1 Centralized Exchanges (CEXs) & Decentralized Exchanges (DEXs)

Let's start with centralized exchange (CEX), as this type of exchange is more user-friendly, especially for beginners in the field of cryptocurrencies.

"A centralized exchange (CEX) is a business that specializes in helping make transactions happen between two parties. In traditional finance, all businesses are centralized exchanges, for example banks (Goldman Sachs), stock trading apps (Robinhood), and payment processors (Visa)." (What is a CEX?)

CEX is managed by a central authority, such as a company or organization. In order for a user to be able to carry out trading operations, they must make a deposit into the exchange's wallet, and the exchange acts as an intermediary for all transactions. CEXs are generally known as an easier-to-use alternative to DEXs, offering high liquidity and faster transaction speeds. However, the user must trust the platform to manage their funds. ()

The core of the system is centralized, featuring an order book and an exchange entity. To engage with centralized crypto exchanges (CEXs), users are required to register an account and undergo identity verification in line with local regulations: *"At the heart of the operation are the order book and exchange entity, making the model centralized. To use a CEX like Binance, you must create an account and verify your identity according to local regulations."* (Gaurav, 2023)

Unlike centralized exchanges, decentralized exchanges, in turn, use fundamentally different operating principles. DEXs do not have a central authority. They operate through smart contracts, which are: *"self-executing pieces of code on a blockchain. An entity or project may create and help run a DEX but it can, in theory, run itself as long as people provide liquidity to it."* (What's the Difference Between a CEX and a DEX?, 2022)

Also, on DEXs, the order book system is typically not used. Instead, they mainly use the automated market maker (AMM) model. AMMs "*allow digital assets to be traded in a permissionless and automatic way by using liquidity pools rather than a traditional market of buyers and sellers."* (What Are Automated Market Makers (AMM)?, 2023)

And this is how it works: "*AMM users supply liquidity pools with crypto tokens, whose prices are determined by a constant mathematical formula. Liquidity pools can be optimized for different purposes…"* (What Are Automated Market Makers (AMM)?, 2023)

Actually, the terms of use for DEXs might seem even easier to some people than those of CEXs: *"To use a DEX, you only need a crypto wallet and some crypto (including enough for any gas / transaction fees). Due to its decentralized nature, there's no registration or account required of its users."* (What's the Difference Between a CEX and a DEX?, 2022)

So, to use a DEX, there is a need to have a crypto wallet (for example, Metamask or Phantom) and a bit of cryptocurrency to cover transaction fees.

In summary, both centralized (CEX) and decentralized (DEX) exchanges offer the same thing - cryptocurrency trading, but with different approaches. The key differences are that CEXs are managed by a central authority, have high liquidity, and fast transaction speeds. However, they require trust in the platform, as well as undergoing registration and verification processes. Decentralized exchanges, on the other hand, use fundamentally different technologies for their operation: smart contract technologies and the AMM model. This enables trading without the need for registration, verification, and providing personal data, which, for many who value anonymity and decentralization, will be more attractive

and will be a significant advantage in favor of choosing a decentralized exchange over a centralized one.

2.2.2 Comparison of trading platforms

Now that we've covered two types of crypto exchanges, it's time to see and compare which exchanges offer the best conditions and terms, starting with CEXs.

Here are some of the most popular and widely used crypto exchanges: Binance, Coinbase (Coinbase Pro), Bybit, OKX, Kucoin, and Bitget.

One of the most important aspects of choosing an exchange is the size of the trading commission. Essentially, this is the only thing that will affect the amount of profit from trading. The lower the commission, the better.

There are two most common methods by which one can buy/sell cryptocurrencies on exchanges: Spot and Futures trading. Let's examine the commission rate for each exchange mentioned above for both markets.

Spot & Margin | USDⓈ-M Futures | COIN-M Futures | Options | Swap Farming | NFT | P2P | Fiat

Level	30-Day Trade Volume (USD*)	and/or	BNB Balance	Maker / Taker	Maker / Taker BNB 25% off
Regular User	< 1,000,000 USD	or	≥ 0 BNB	0.1000% / 0.1000%	0.0750% / 0.0750%
VIP 1	≥ 1,000,000 USD	and	≥ 25 BNB	0.0900% / 0.1000%	0.0675% / 0.0750%
VIP 2	≥ 5,000,000 USD	and	≥ 100 BNB	0.0800% / 0.1000%	0.0600% / 0.0750%
VIP 3	≥ 20,000,000 USD	and	≥ 250 BNB	0.0420% / 0.0600%	0.0315% / 0.0450%
VIP 4	≥ 100,000,000 USD	and	≥ 500 BNB	0.0420% / 0.0540%	0.0315% / 0.0405%
VIP 5	≥ 150,000,000 USD	and	≥ 1,000 BNB	0.0360% / 0.0480%	0.0270% / 0.0360%
VIP 6	≥ 400,000,000 USD	and	≥ 1,750 BNB	0.0300% / 0.0420%	0.0225% / 0.0315%
VIP 7	≥ 800,000,000 USD	and	≥ 3,000 BNB	0.0240% / 0.0360%	0.0180% / 0.0270%
VIP 8	≥ 2,000,000,000 USD	and	≥ 4,500 BNB	0.0180% / 0.0300%	0.0135% / 0.0225%
VIP 9	≥ 4,000,000,000 USD	and	≥ 5,500 BNB	0.0120% / 0.0240%	0.0090% / 0.0180%

Figure 21: Fee Rate. Source: Fees & Transactions Overview

Spot & Margin | USDⓈ-M Futures | COIN-M Futures | Options | Swap Farming | NFT | P2P | Fiat

Level	30-Day Trade Volume (USD*)	and/or	BNB Balance	USDT Maker / Taker	USDT Maker/Taker BNB 10% off	USDC Maker / Taker	USDC Maker/Taker BNB 10% off
Regular User	< 15,000,000 USD	or	≥ 0 BNB	0.0200%/0.0500%	0.0180%/0.0450%	0.0180%/0.0450% ~~0.0200%/0.0500%~~	0.0162%/0.0405% ~~0.0180%/0.0450%~~
VIP 1	≥ 15,000,000 USD	and	≥ 25 BNB	0.0160%/0.0400%	0.0144%/0.0360%	0.0144%/0.0360% ~~0.0160%/0.0400%~~	0.0129%/0.0324% ~~0.0144%/0.0360%~~
VIP 2	≥ 50,000,000 USD	and	≥ 100 BNB	0.0140%/0.0350%	0.0126%/0.0315%	0.0126%/0.0315% ~~0.0140%/0.0350%~~	0.0113%/0.0283% ~~0.0126%/0.0315%~~
VIP 3	≥ 100,000,000 USD	and	≥ 250 BNB	0.0120%/0.0320%	0.0108%/0.0288%	0.0108%/0.0288% ~~0.0120%/0.0320%~~	0.0097%/0.0259% ~~0.0108%/0.0288%~~
VIP 4	≥ 600,000,000 USD	and	≥ 500 BNB	0.0100%/0.0300%	0.0090%/0.0270%	0.0090%/0.0270% ~~0.0100%/0.0300%~~	0.0081%/0.0243% ~~0.0090%/0.0270%~~
VIP 5	≥ 1,000,000,000 USD	and	≥ 1,000 BNB	0.0080%/0.0270%	0.0072%/0.0243%	0.0072%/0.0243% ~~0.0080%/0.0270%~~	0.0064%/0.0218% ~~0.0072%/0.0243%~~
VIP 6	≥ 2,500,000,000 USD	and	≥ 1,750 BNB	0.0060%/0.0250%	0.0054%/0.0225%	0.0054%/0.0225% ~~0.0060%/0.0250%~~	0.0048%/0.0202% ~~0.0054%/0.0225%~~
VIP 7	≥ 5,000,000,000 USD	and	≥ 3,000 BNB	0.0040%/0.0220%	0.0036%/0.0198%	0.0036%/0.0198% ~~0.0040%/0.0220%~~	0.0032%/0.0178% ~~0.0036%/0.0198%~~

Figure 22: Fee Rate. Source: Fees & Transactions Overview

For Binance, the maker and taker fees for spot trading are 0.1%, and for futures trading, the fees are 0.02% for makers and 0.05% for takers for regular users.

The difference between maker fees and taker fees lies in the way a trader opens or closes a trade. *"The Maker Fee is a fee charged by the trader who adds liquidity to the order book… The taker fee is the fee paid by the trader to the exchange when the trade order is executed."* (Maker Fees and Taker Fees in Crypto Trading, 2022)

In other words, for example, if we want to enter a trade right now and do so through a market order, we will pay the taker fees for it. If we're going to enter a trade at a specific price, we can place a limit order at that price, and it will only be executed when the price reaches the level of that order. In this case, we will pay the maker fees. Maker fees are almost always much lower than taker fees.

PRICING TIER	TAKER FEE	MAKER FEE
Up to $10k	0.60%	0.40%
$10k - $50k	0.40%	0.25%
$50k - $100k	0.25%	0.15%
$100k - $1m	0.20%	0.10%
$1m - $15m	0.18%	0.08%
$15m - $75m	0.16%	0.06%
$75m - $250m	0.12%	0.03%
$250m - $400m	0.08%	0.00%
$400m+	0.05%	0.00%

Figure 23: Tiers. Source: Trading Fees

For Coinbase Pro (a more advanced version of Coinbase), the taker fee is 0.6%, and the maker fee is 0.4% for a regular user. It doesn't have an option to trade futures.

VIP Level	Spot Trading*		Perpetual & Futures Contracts Trading		USDC Options Trading	
	Taker Fee Rate	Maker Fee Rate	Taker Fee Rate	Maker Fee Rate	Taker Fee Rate	Maker Fee Rate
VIP 0	0.1000%	0.1000%	0.0550%	0.0200%	0.0200%	0.0200%
VIP 1	0.0800%	0.0675%	0.0400%	0.0180%	0.0200%	0.0150%
VIP 2	0.0775%	0.0650%	0.0375%	0.0160%	0.0200%	0.0150%
VIP 3	0.0750%	0.0625%	0.0350%	0.0140%	0.0200%	0.0150%
VIP 4	0.0600%	0.0500%	0.0320%	0.0120%	0.0180%	0.0150%
VIP 5	0.0500%	0.0400%	0.0320%	0.0100%	0.0150%	0.0100%

Figure 24: Trading Fee Rate. Source: Bybit Trading Fee Structure, 2024

For Bybit, the maker and taker fees for spot trading are 0.1%, and for futures trading, the fees are 0.02% for makers and 0.055% for takers for regular users.

Regular users							
Tier	Total OKB holding	Assets (USD)	or	30-day trading volume (USD)	Maker fee	Taker fee	24h crypto withdrawal limit (USD)
Lvl 1	< 100	< 100,000	/	< 5,000,000	0.080%	0.100%	10,000,000
Lvl 2	≥ 100	< 100,000	/	< 5,000,000	0.075%	0.090%	10,000,000
Lvl 3	≥ 200	< 100,000	/	< 5,000,000	0.070%	0.080%	10,000,000
Lvl 4	≥ 500	< 100,000	/	< 5,000,000	0.065%	0.070%	10,000,000
Lvl 5	≥ 1,000	< 100,000	/	< 5,000,000	0.060%	0.060%	10,000,000

Figure 25: Regular users. Source: Trading fee

Regular users							
Tier	Total OKB holding	Assets (USD)	or	30-day trading volume (USD)	Maker fee	Taker fee	24h crypto withdrawal limit (USD)
Lvl 1	< 100	< 100,000	/	< 50,000,000	0.020%	0.050%	10,000,000
Lvl 2	≥ 100	< 100,000	/	< 50,000,000	0.018%	0.045%	10,000,000
Lvl 3	≥ 200	< 100,000	/	< 50,000,000	0.017%	0.040%	10,000,000
Lvl 4	≥ 500	< 100,000	/	< 50,000,000	0.016%	0.035%	10,000,000
Lvl 5	≥ 1,000	< 100,000	/	< 50,000,000	0.015%	0.030%	10,000,000

Figure 26: Regular users. Source: Trading fee.

For OKX, the maker and taker fees for spot trading are 0.08% and 0.1%, respectively, and for futures trading, the fees are 0.02% for makers and 0.05% for takers for regular users.

VIP Level	Amount of KCS Held	or	Spot Trading Volume - BTC (Last 30 Days)	or	Futures Trading Volume - BTC (Last 30 Days)	Maker/Taker	Pay Fees with KCS (20% off) Maker/Taker	24h Withdrawal Limit (USDT)
LV0	<1,000	or	<50	or	<100	0.1% / 0.1%	0.08% / 0.08%	1,000,000
LV1	≥1,000	or	≥50	or	≥100	0.09% / 0.1%	0.072% / 0.08%	3,000,000
LV2	≥10,000	or	≥200	or	≥160	0.07% / 0.09%	0.056% / 0.072%	3,000,000
LV3	≥20,000	or	≥500	or	≥320	0.05% / 0.08%	0.04% / 0.064%	5,000,000
LV4	≥30,000	or	≥1,000	or	≥800	0.03% / 0.07%	0.024% / 0.056%	5,000,000
LV5	≥40,000	or	≥2,000	or	≥1,200	0% / 0.07%	0% / 0.056%	10,000,000
LV6	≥50,000	or	≥4,000	or	≥2,400	0% / 0.06%	0% / 0.048%	10,000,000
LV7	≥60,000	or	≥8,000	or	≥4,000	0% / 0.05%	0% / 0.04%	15,000,000
LV8	≥70,000	or	≥15,000	or	≥6,000	-0.005% / 0.045%	-0.005% / 0.036%	15,000,000
LV9	≥80,000	or	≥25,000	or	≥8,000	-0.005% / 0.04%	-0.005% / 0.032%	30,000,000
LV10	≥90,000	or	≥40,000	or	≥12,000	-0.005% / 0.035%	-0.005% / 0.028%	40,000,000

Figure 27: Spot fees. Source: VIP Program.

VIP Level	Amount of KCS Held	or	Spot Trading Volume - BTC (Last 30 Days)	or	Futures Trading Volume - BTC (Last 30 Days)	Maker/Taker	24h Withdrawal Limit (USDT)
LV0	<1,000	or	<50	or	<100	0.02% / 0.06%	1,000,000
LV1	≥1,000	or	≥50	or	≥100	0.018% / 0.06%	3,000,000
LV2	≥10,000	or	≥200	or	≥160	0.015% / 0.06%	3,000,000
LV3	≥20,000	or	≥500	or	≥320	0.01% / 0.06%	5,000,000
LV4	≥30,000	or	≥1,000	or	≥800	0.008% / 0.053%	5,000,000
LV5	≥40,000	or	≥2,000	or	≥1,200	0.006% / 0.048%	10,000,000
LV6	≥50,000	or	≥4,000	or	≥2,400	0.004% / 0.043%	10,000,000
LV7	≥60,000	or	≥8,000	or	≥4,000	0.002% / 0.039%	15,000,000
LV8	≥70,000	or	≥15,000	or	≥6,000	0% / 0.036%	15,000,000
LV9	≥80,000	or	≥25,000	or	≥8,000	-0.002% / 0.033%	30,000,000
LV10	≥90,000	or	≥40,000	or	≥12,000	-0.004% / 0.03%	40,000,000

Figure 28: Futures fees. Source: VIP Program.

For Kucoin, the maker and taker fees for spot trading are 0.1%, and for futures trading, the fees are 0.02% for makers and 0.06% for takers for regular users.

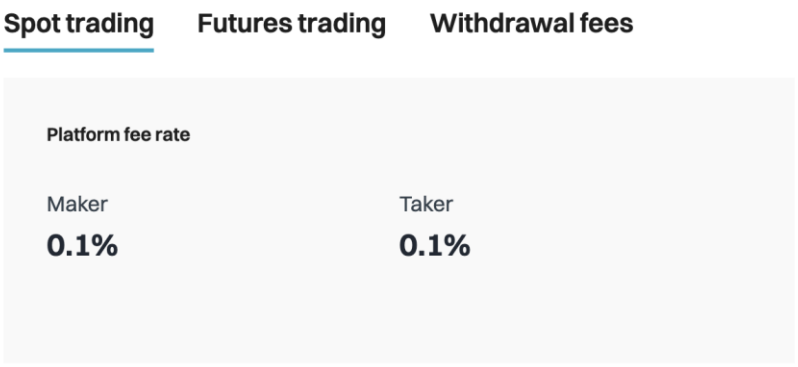


Figure 29: Transaction fee explanation. Source: Fee schedule

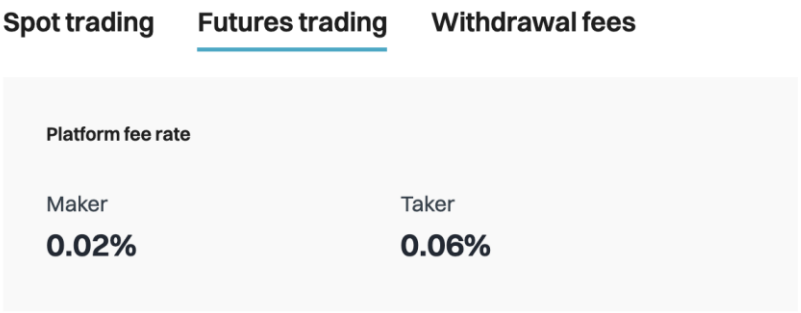


Figure 30: Transaction fee explanation. Source: Fee schedule

For Bitget, the maker and taker fees for spot trading are 0.1%, and for futures trading, the fees are 0.02% for makers and 0.06% for takers for regular users.

Overall, it can be observed that the spot trading fees across all exchanges are quite similar, averaging around 0.1% for both makers and takers. However, the fees for futures trading vary, with the lowest fees for makers at 0.02% and 0.05% for takers. It's also worth noting that Coinbase Pro has the highest fees at 0.6% and 0.4% for takers and makers, respectively. Additionally, this exchange lacks futures trading. In general, low fees can increase potential trading profits, especially if the trader performs many short-term trades.

Speaking of decentralized exchanges, the most popular and widely used among them is Uniswap. Let’s take a closer look at Uniswap’s fees.

As we mentioned earlier, decentralized exchanges are distinct in that they do not have a traditional order book like centralized exchanges but rather conduct transactions through the AMM (Automated Market Maker) model. Because of this, decentralized exchanges do not differentiate fees between makers and takers. Instead, they typically apply one standard fee. To trade on these exchanges, we would have to pay a trading fee to the exchanges plus

blockchain fees (also known as network fees). (The Ins and Outs of Decentralized Exchanges (DEXs)

It's also worth noting that futures trading is not commonly used on DEXs. This means that, in terms of trading options, futures trading, which allows traders to take long positions (betting on the price going up) or short positions (betting on the price going down), is more commonly associated with centralized exchanges (CEXs). Once again, this is due to the nature of DEXs' technologies, such as Automated Market Makers (AMMs).

Speaking of trading fees, *"Uniswap applies a 0.30% fee to trades, which is added to reserves."* (How Uniswap works)

In conclusion, both decentralized and centralized exchanges have their own set of advantages and different operating principles. The preference should be given to the one that best suits the specific needs and requests of the trader. CEXs offer high liquidity, fast transaction speeds, futures, and spot trading and are user-friendly, especially for beginners, but require trust in central authority and compliance with registration and verification processes. On the other hand, DEXs prioritize anonymity and decentralization and avoid centralized control, utilizing technologies such as smart contracts and the AMM model for trading without traditional order books.

3 SUMMARY OF THE THEORETICAL PART

The theoretical part of this bachelor's thesis examines various trading strategies used in the analysis of charts and price movements. There are two main approaches to analysis: technical and fundamental, with an emphasis on technical analysis as the primary method for developing trading strategies. Attention is also given to understanding the fundamental principles of technical analysis, which includes studying market price behavior on charts to predict future assets' movements.

Methods for identifying trends, support and resistance levels, chart patterns, and their impact on price formation and subsequent movement are thoroughly discussed. These methods also assist in determining entry and exit points from a position.

Technical indicators such as volume, moving averages, and the Relative Strength Index (RSI) further complement the aforementioned trading strategies and play a significant role in the competent identification of trading positions.

Identifying the key principles of developing the own trading strategy helps to formulate the necessary aspects that must be anticipated and included in the trading strategy. Entry rules, stop-losses, and take-profits, choosing timeframes, proper risk management, and analyzing market volatility are of immense importance when applying technical analysis and are indispensable when using one's own trading strategy.

The concept of digital assets, such as cryptocurrencies or CBDCs, is also defined.

Theoritcal part also compares various trading platforms and discusses their division into centralized and decentralized platforms.

II. PRACTICAL PART

4 TRADING STRATEGY DEVELOPMENT

4.1 Defining the goals and objectives of the trading strategy

Before beginning the long-awaited process of developing the trading strategy itself, it's crucial to understand what specifically and which goals can be achieved with this strategy. Simply saying that the main thing is for the strategy to be profitable is not enough. After all, the same S&P 500 index (a stock market index that tracks the stocks of the 500 largest U.S. companies (Amadeo, 2022)) can also be profitable if bought at the right moment and “forgotten” for a few years. But in the case of this index, buying it once and forgetting it does not require any trading, there is no need to constantly analyze the market to find the right entry point for a trade, and there is no need to constantly change the trading strategy to adapt to changing market cycles. It can just be purchased and "forgotten." Naturally, there should also be a disclaimer that this index does not always grow and has unprofitable years. However, most consider it a basis for assessing the profitability of any potential investment. (What Is a Good Return on Investment (ROI)? (Plus Formula), 2023)

The average 1-year return on the S&P 500 index for the last 30 years is 10.2%. (Mitchell, 2024.) Therefore, based on this, the target for potential ROI for our strategy should be more than 10.2% annually or. In this context, this would be reasonable. If the developed trading strategy achieves such a result, it can be considered satisfactory.

To calculate the required monthly return to achieve a 10.2% annual return with compounding, we can use the formula:

$$(1 + r)^{\frac{1}{n}} - 1 = g$$

Where:

r = annual return (10.2% or 0.102);

n = number of compounding periods per year (12 for monthly);

g = periodic return.

After solving it:

g = 0.008166 or 0.8166%

Therefore, to achieve a 10.2% annual return with monthly compounding, the strategy needs to generate a monthly return of 0.8166% or approximately 0.82% per month.

However, it is also important to take into account the fact that the size of the profit is also affected by the exchange commission for transactions. The exchange takes commissions for transactions for both opening and closing a position. For example, considering the highest commission for futures trading and for the role of taker, the commission would be 0.06% of the position size for its opening/closing. However, since it is impossible to predict the volume of trades that will be made over the subsequent trading days, there can only be made an assumption. Let's do this for 3 cases, if over time there will be made: 10, 50, and 100 trades (assuming the worst-case scenario of a 0.06% taker commission on the futures market for each trade, which is charged twice). Here is how it's calculated:

Since this involves a system of equations with two unknowns (the required monthly return and the number of trades executed), as the number of trades affects the total commissions paid, let's calculate the required monthly return for different numbers of trades per month: 10, 50, and 100.

The formula to calculate the required monthly return is:

$$(1 + r)^n = \frac{(1 + 0.008166)^{12}}{(1 - c)^n}$$

Where:

r - the required monthly return after accounting for commissions;

n - the number of trades per month;

*c - the commission percentage (0.06% * 2 = 0.12%).*

Considering three cases:

If n (trades per month) = 10, then r (required monthly return) = 0.88%.

If n (trades per month) = 50, then r (required monthly return) = 1.02%.

If n (trades per month) = 100, then r (required monthly return) = 1.15%.

Therefore, the more trades executed per month, the higher the required monthly return to compensate for commission expenses and achieve the target 10.2% annual return with compounding.

Thus, using the formulas, certain benchmarks have been established, based on which one can approximately understand whether the developed strategy is successful or not.

4.2 Selecting an asset for implementing the trading strategy

As part of the development of the trading strategy, a decision was made to choose two assets on which the strategy will be tested and subsequently used: Bitcoin (BTC) and Ethereum (ETH). This choice is due to several important reasons:

Liquidity: Bitcoin and Ethereum are the most liquid assets in the cryptocurrency market. High liquidity also ensures the narrowest spreads on trading platforms, providing better conditions for entering and exiting trades. This, in turn, reduces potential costs and improves trading conditions.

Volatility: Even though cryptocurrencies are already relatively more volatile assets compared to more traditional trading instruments, such as stocks, Bitcoin, and Ethereum, due to their highest capitalization, they have less volatility than other cryptocurrencies with smaller market capitalization. Unlike major assets, small-cap cryptocurrencies are often subject to sharp price fluctuations, market manipulations, and have lower liquidity. This increases risk and makes trading less predictable, which, correspondingly, can facilitate further trading.

Availability on exchanges: Bitcoin and Ethereum are available on all major cryptocurrency exchanges, providing traders with easy access to trading these assets at any time.

Strategy Specifics: The choice to focus solely on Bitcoin and Ethereum is also justified by the understanding that the developed trading strategy may not work equally well for all assets. As the cryptocurrency market is highly heterogeneous, different coins may react to the same trading signals in entirely different ways due to differences in their fundamental and technical characteristics. Focusing on Bitcoin and Ethereum creates an opportunity to test and debug the strategy in the context of assets with the most stable market structure and liquidity. This allows for greater confidence in attributing trading results to the strategy's effectiveness, rather than external factors that might otherwise impact other assets.

Overall, including only Bitcoin and Ethereum in the trading strategy allows for focusing on the most promising and stable assets while minimizing the risks associated with volatility and liquidity. This approach ensures a balance between the potential for high returns and the need for effective risk management.

4.3 Developing the trading strategy

In the previous sections, the theoretical foundations that underpin successful trading in the cryptocurrency market were thoroughly explored. Topics such as volume, RSI, and moving averages were covered, as well as principles for identifying trends, support and resistance levels, and chart patterns. Now, armed with knowledge about the essentials of building a trading strategy to make all these theoretical insights work, we can proceed to systematically and effectively apply theoretical knowledge into practice.

4.3.1 Strategy components

In the process of developing the trading strategy, I aim to maximize the use of knowledge and theoretical foundations from the theoretical part of my bachelor's thesis. My goal is to integrate a complete set of technical indicators and analysis methods into the strategy. This decision is justified by the fact that demonstrating a comprehensive approach to market analysis is key to developing an effective trading strategy, which will have a profound rationale for its fundamental principles of operation.

Ultimately, the desired result is not just to mechanically apply each aspect of the described trading methods but to harmoniously combine them. Combine them in such a way that they complement each other. Here is how each of the previously described trading methods will be used:

Simple Moving Average (SMA): The primary way this indicator will be used is to identify and confirm active trends of an asset. By analyzing moving averages over different periods, potential bullish or bearish market trends can be recognized. Additionally, upon detection, this indicator can serve as a signal for entry positions when a Moving average Crossover occurs. SMA-50 will be used.

Volume: Volume analysis will be an integral part of confirming the strength of price movement. An increase in volume accompanying price movement will indicate confidence in the strength of buyers/sellers and will serve as additional confirmation of the likelihood of a specific trade’s success. Volume spikes will also be a useful signal for determining potential reversals and confirming the significance of support and resistance levels.

Relative Strength Index (RSI): RSI will be used to identify overbought or oversold conditions in the market. By setting thresholds at 70 (overbought) and 30 (oversold), RSI will help indicate potential reversal points. Another useful property that will be present in

the trading strategy is the identification of divergences using this indicator, which can timely signal a price and trend reversal.

Trends: By marking trend lines on the price chart of an asset, the dominating trend can be determined and then it would be possible to open a trade in its direction (also not trade against its direction to avoid losses.) Early recognition of these trends will allow us to benefit from large movements, adhering to the principle that *"the trend is your friend."*

Support and resistance levels: A mandatory condition will be the application of support and resistance levels, as these levels represent critical price points where the forces of supply and demand converge. These levels represent significant psychological price points that can influence market behavior. These levels will help in determining a profitable entry point into a position (on a bounce/breakthrough of levels).

Chart patterns: The trading strategy will also pay attention to patterns, such as triangles, wedges, "Head and Shoulders", and double tops/bottoms, as they can provide valuable information on continuation or trend reversals.

Position sizing: To preserve trading capital and intelligently control risks, it is important to know what part of the capital can be risked when opening a trade. According to generally accepted rules, the trading strategy will apply the rule not to risk more than 1% of the trading capital on each trade. Later in this chapter, I will explain how to properly calculate the required position amount to ensure that no more than 1% of the portfolio is risked when the stop-loss is triggered.

Stop-Loss: For setting a stop-loss, there will be used method of placing it below a previous low in a long trade or above a previous high in a short trade.

Risk/Reward Ratio: As described earlier, the trading strategy will apply an RRR (risk to reward ratio) of 1:1. Meaning that the take profit point will be as far away from the entry point as the stop-loss is distanced. This also implies that it will first be necessary to determine and set a stop-loss for the position, and only then the take-profit, as it will be based on the distance from the entry point to the stop-loss.

Each of these trading methods will be a component of one large holistic trading strategy, the goal of which, by clearly integrating these essentials, will be to identify and reveal trades with the maximum probability of success. Integrating the full spectrum of technical indicators and analytical methods from the theoretical part of my work into a practical trading strategy is a foundational aspect of my approach to trading in the digital assets

market. This not only enhances my chances of success but also provides confidence in my trading decisions, based on proven and reliable indicators and analysis. By systematically applying the methods described above, a system will be created that has a calibrated balance between profit and risk management.

4.3.2 Trading & Charting platforms

As a platform for using various indicators, backtesting, searching for trades, and their subsequent analysis, TradingView.com will be used due to its convenience, wide selection of different indicators, and the ability to save drawings on charts.

Furthermore, the futures market will be used for trading. The futures market offers a significant advantage over the spot market in that it allows for opening a position either long (betting on price increase) or short (betting on price decrease), which is not possible on the spot market. On the spot market, it is possible to only buy assets.

As a trading platform, the cryptocurrency exchange Bitget will be utilized. Although the cryptocurrency exchange Bitget does not have the lowest trading fees, since I am an ambassador for this exchange and cannot use others under the contract, it will be the platform used for trading. Also, from an economic perspective, I receive back 50% of all the commissions I spend, which makes this exchange the most beneficial option available. However, for the sake of fairness and the purity of the experiment, I will not take into account the 50% discount later, and the standard commission will be applied: 0.02% for limit orders (maker fee) and 0.06% for market orders (taker fee) in the futures market.

4.3.3 Position size calculator

As mentioned earlier, the correct position size is a crucial factor in the success of a trading strategy. Why it's important to risk no more than exactly 1% of the trading capital was described above; now, it’s time to move on to its practical application.

By one percent risk, it means the risk of losing capital in case of an unsuccessful trade, that is, when the price reaches the stop-loss. However, in different trades, the distance from the entry point to the stop-loss level varies. For example, on smaller timeframes, such as 5m, 15m, the distance to the stop-loss can be less than one percent. On larger timeframes, it can be several percent or more. Consequently, the position size must be calculated based on the distance from the entry point to the stop-loss. Here is the formula for calculating the position size:

$$Position\ size = \frac{Risk\ per\ trade\ (in\ \$)}{difference\ between\ entry\ and\ stop-loss}$$

Where:

Risk per trade = 1% as predetermined by the strategy;

Difference between entry and stop-loss: this value can be extracted directly from TradingView.com using the Ruler tool. Therefore, there's no need to calculate it manually.

For example: suppose a trader has $100 in the trading account, in which case the risk per trade should be $1 (1% of $100). Suppose the trader wants to enter a position where the difference between the entry point and the stop-loss = 2.5%. In this case, acting according to the formula, it can be calculated that the position size will be: $\frac{1}{0.025} = \$40$. In this case, if the trader's assumption does not work out and the price reaches the stop-loss, the trader will lose exactly one dollar (1% of the trading capital).

But since there is sometimes no time to calculate the exact position size, as the price can change quickly, as a result of which one may not have time to enter a position, I created an Excel Calculator that will help in calculating the necessary trading position.

	A	B	C	D	E
1	**Input:**			**Output:**	
2	**Portfolio**	**$ 1,000.00**		**Position type**	**Long**
3	**Risk per trade**	**1%**		**Stop and Entry difference**	**2.90%**
4	**Entry point**	**67950.0000**		**Risk amount**	**$ 10.00**
5	**Stop-loss**	**65980.0000**		**Position size**	**$ 344.83**
6	**Leverage**	**10**		**Collateral (for leveraged trades)**	**$ 34.48**

Figure 31: Screenshot of position size Excel calculator. Own work.

The calculator works very simply. The only things that need to be entered once and then not changed are the portfolio size, risk per trade, and leverage (if necessary, relevant for futures trading). Then, when I need to enter a trade, I only need to specify the entry point and stop-loss, after which the calculator will immediately provide the necessary position size and the size of the collateral, in the case of using leverage (calculated as: $Collateral = \frac{Position\ size}{Leverage}$).

5 ANALYSIS OF THE EFFECTIVENESS OF THE DEVELOPED TRADING STRATEGY

5.1 Conducting backtesting

For backtesting the developed trading strategy, the TradingView.com platform will be used, where I have uploaded three indicators needed for the test: Simple Moving Average (SMA) with a period length of 50, Volume, and Relative Strength Index (RSI).

Historical data for Bitcoin and Ethereum will be used, and backtesting will be conducted on timeframes such as 5m (5 minutes), 15m (15 minutes), 1H (1 hour), and 4H (4 hours). This means that each candle on the chart will correspond to time intervals of 5, 15, 60, and 240 minutes, respectively.

Since it will be impossible within the scope of this bachelor's thesis to attach all the charts from trades taken for backtesting, I will now present the final outcome and key metrics resulting from testing the developed trading strategy. In the following chapter, I will attach images of charts from some trades taken from the backtesting, which should be noted and can indicate where and how the trading strategy can be improved.

Backtesting was conducted on the BTCUSDT and ETHUSDT trading pairs for the Bitget cryptocurrency exchange across 5-minute, 15-minute, 1-hour, and 4-hour timeframes. Results of backtesting as follows:

Backtesting timeframe: 2 months

Total Trades: 50

Winning Trades: 26

Losing Trades: 24

Win Rate (Winning Trades / Total Trades) * 100): 52%

Risk-Reward Ratio (RRR): 1:1 as predetermined by the strategy

ROI: 2%

Monthly ROI: 1%

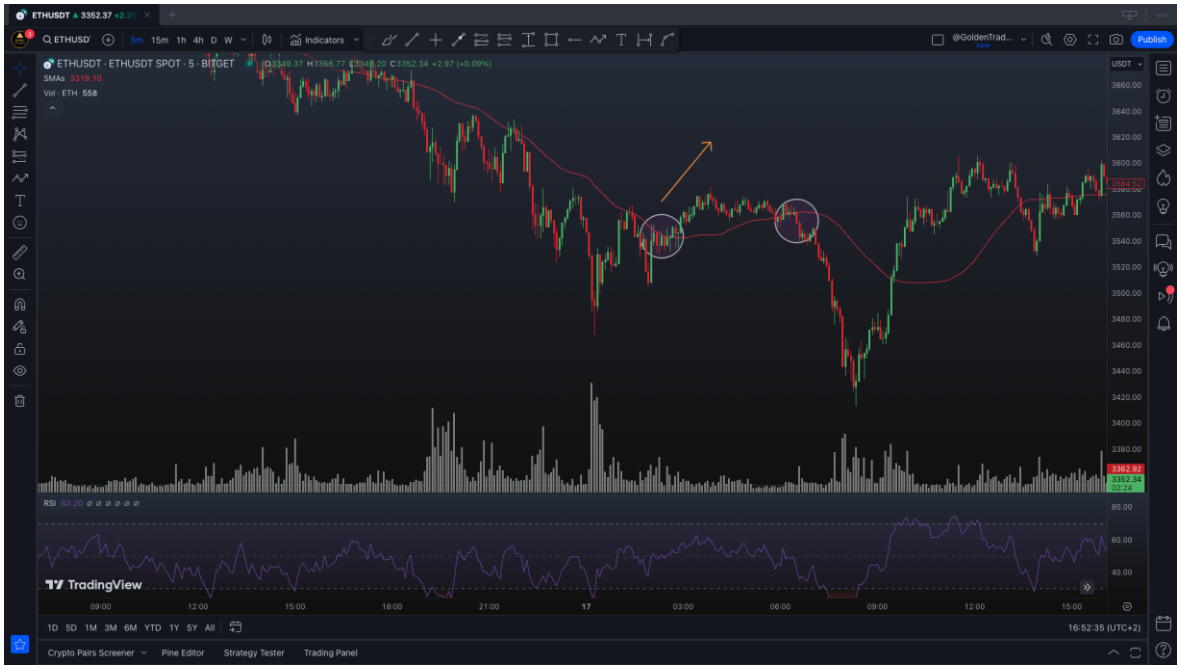
5.2 Analysis of the backtesting results

In the following, several screenshots of backtesting trades on historical data for the cryptocurrency pairs BTCUSDT and ETHUSDT will be presented. These are worth paying attention to in order to adjust and change the trading strategy (in the next section of this chapter).

In the trade from March 7, 2024, an entry was made on a short signal after the formation of a Double Top pattern. The take profit was set at 66619, at an equal distance from the entry point as the stop-loss. The price only reached 66760 before reversing, bouncing off the support level without reaching the take profit. The trade was unprofitable.

In the trade from March 4, 2024, following a long signal from a Symmetrical Triangle, the stop-loss was set beyond the nearest low (below the 64602 level), which saved it from being a losing trade as the price nearly reached the stop but did not break below the support level. The trade was profitable.

In the trade from February 14, 2024, on a short signal after the formation of a Double Top, the price again hit the support levels and reversed without reaching the take-profit level. The trade was unprofitable.



In the trade from March 17, 2024, the SMA-50 signaled a trend reversal and gave a buy signal, but then the price returned back and went even lower, indicating that it was a false signal. The trade opened based on this signal would have been unprofitable.

5.3 Optimizing the trading strategy based on backtesting insights

The screenshots described in the section above had a recurring character throughout the whole backtesting process. The trades from above represent the most common reasons for failure in trades (reaching the stop-loss) under the conditions of the developed trading strategy. Moving forward, to avoid similar loss-making trades in the future with real money and trading on the exchange, it is necessary to make several improvements to the trading strategy itself:

Improvement 1: Often, trades did not reach the take-profit level because the price hit support or resistance levels that were located near the take-profit points. Consequently, I believe it is necessary to improve the strategy and add to the strategy's exit points a provision that if the take-profit level is beyond a support/resistance level, it would be better to slightly reduce the profit on the trade, but move the take-profit closer to the entry point so that the price can reach it without reversing at the support levels (in the case of a short trade) or resistance levels (in the case of a long trade). In all trades during backtesting, the take-profit levels were the same distance from the entry point as the stop-loss, i.e., RRR (risk-to-reward ratio) = 1:1. Thus, after applying this strategy improvement, the RRR will increase and be more than 1, which means that on average for such trades, the potential risk will be

insignificantly higher than the potential profit, but the main advantage will be that the probability of success (and subsequently, the win ratio) should increase significantly.

Improvement 2: There were often situations where trades, in which the SMA indicator with a period length of 50 signaled a trend reversal and then the price retraced back again, indicating frequent false signals from this indicator. Since the Simple Moving Average indicator is a useful tool for determining the direction of the trend, I have decided to add to this indicator with a period length of 50, also SMA-100 and SMA-200. These indicators have much longer period lengths, specifically twice and four times as long, respectively, which means that these two additional indicators will take the past 100 and 200 candles, which should indicate a more global trend and not give as many false signals about trend changes as the length 50 does. As a result, there will be 3 SMA lines in total on the TradingView.com chart, with 50, 100, and 200 period lengths.

6 TRADING STRATEGY IMPLEMENTATION

6.1 Executing transactions with the selected asset on the trading platform

After making the necessary improvements to the trading strategy after backtesting, it's time to start trading on the exchange to see how the strategy performs under real conditions with real money. To this end, I deposited 1000 United States Dollars (in the stablecoin USDC) into the Bitget exchange.

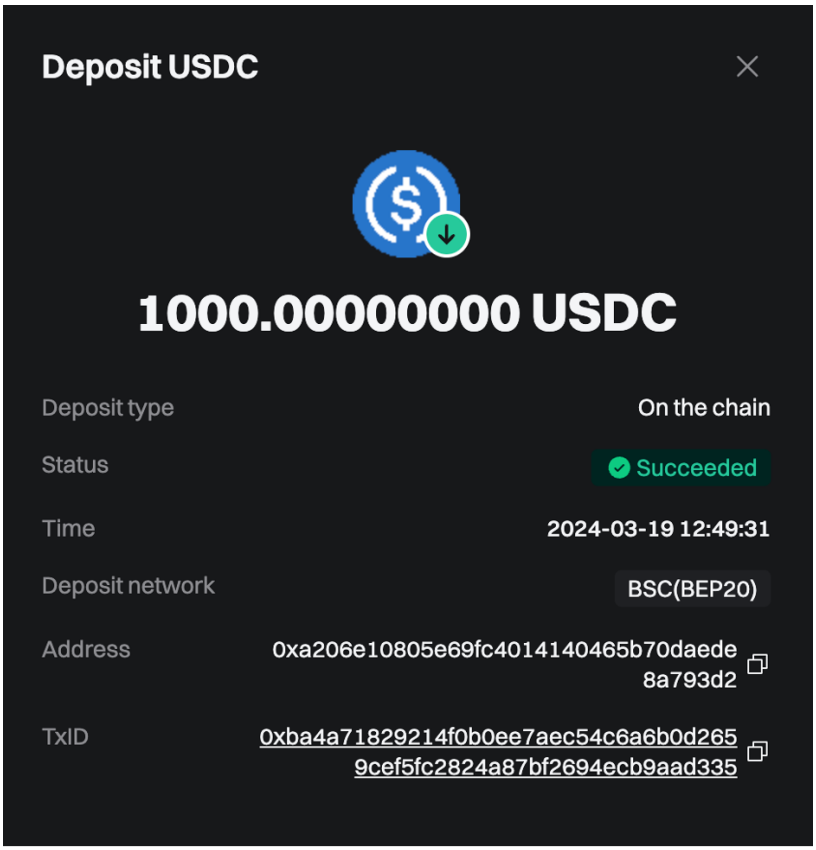


Figure 32: Deposit of USDC on Bitget. Source: own processing.

Next, I exchange USDC for USDT, as the majority of transactions on crypto exchanges are conducted in USDT.

After that, it is necessary to transfer this balance to the exchange's futures balance. This will allow me to open both long and short positions.

For calculating the volume of each position, an Excel Calculator mentioned earlier will be used.

For convenience, a leverage of x10 will be used for each position. It's worth noting that using a 10x leverage does not mean that the risk and profit will also increase by 10 times. The risk and profit will also be equal to 1% of the trading deposit, that is $10 (1% of $1000). In this case, the leverage will play a different role in the trades – the leverage will reduce the necessary amount of personal funds that need to be invested in the transaction. If, for example, trading occurs on low timeframes such as 5-minutes or 15-minutes (which means that the price movements in a specific trade will be small, hence the position size will be relatively large to achieve 1% risk), and it is necessary to open several transactions, there may not be enough own capital for this. It is for this reason that leverage is used – not to increase potential profit/risk, but to enable the opening of several positions at the same time if necessary.

Below, screenshots with charts for BTCUSDT and ETHUSDT will be presented before entering a trade and after exiting the trade with the result. Also, for each trade, I will add a screenshot from the exchange itself, where my entry point will be indicated, as well as the potential profit and loss in case of take-profit and stop-loss (the Bitget exchange allows setting orders in advance to close the trade at desired price levels for take-profit and stop-loss, also indicating the profit/loss equivalent in USDT in advance.)

Trade №1: Bullish trend confirmed by price staying above three Simple Moving Averages for an extended period. RSI indicator does not signal oversold conditions. Symmetrical triangle pattern on the chart also confirms the uptrend. Trade closed at a profit.

Figure 33: ETHUSDT. Source: own processing.

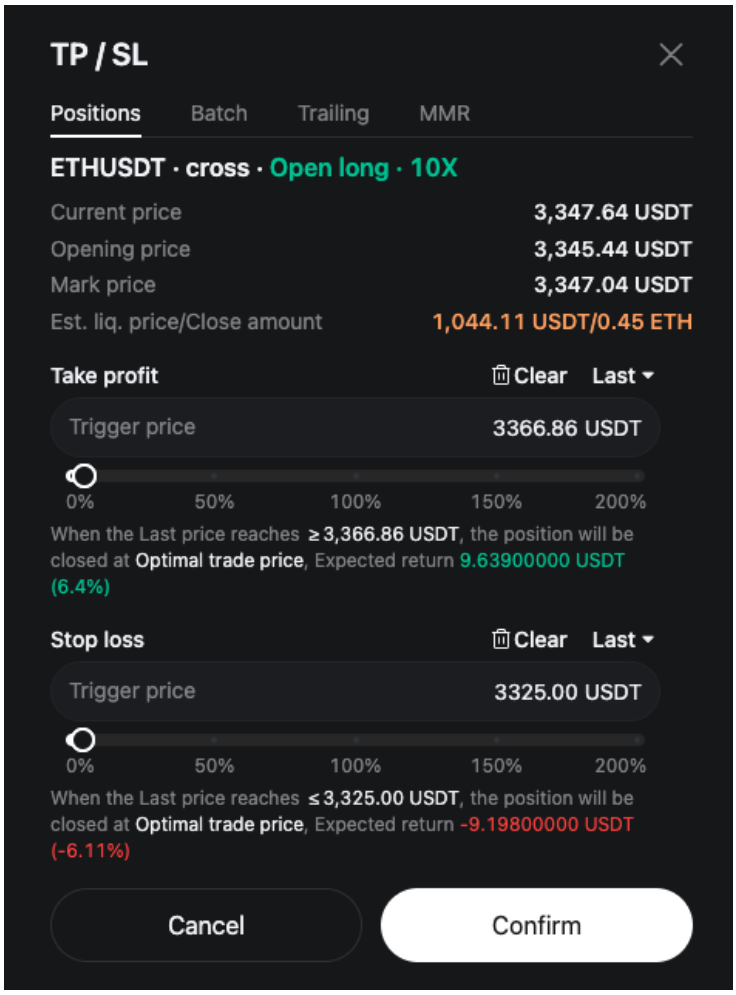


Figure 34: Position information. Source: own processing.

Figure 35: ETHUSDT. Source: own processing.

Trade №2: BTCUSDT is in a downtrend and has just bounced from the resistance trendline. The price almost reached the take profit level but then retraced back, so the trade was closed with profit at around 65420 but not at the take profit level. This turned out to be a good decision, as the price subsequently reached the stop-loss level.

Figure 36: BTCUSDT. Source: own processing.

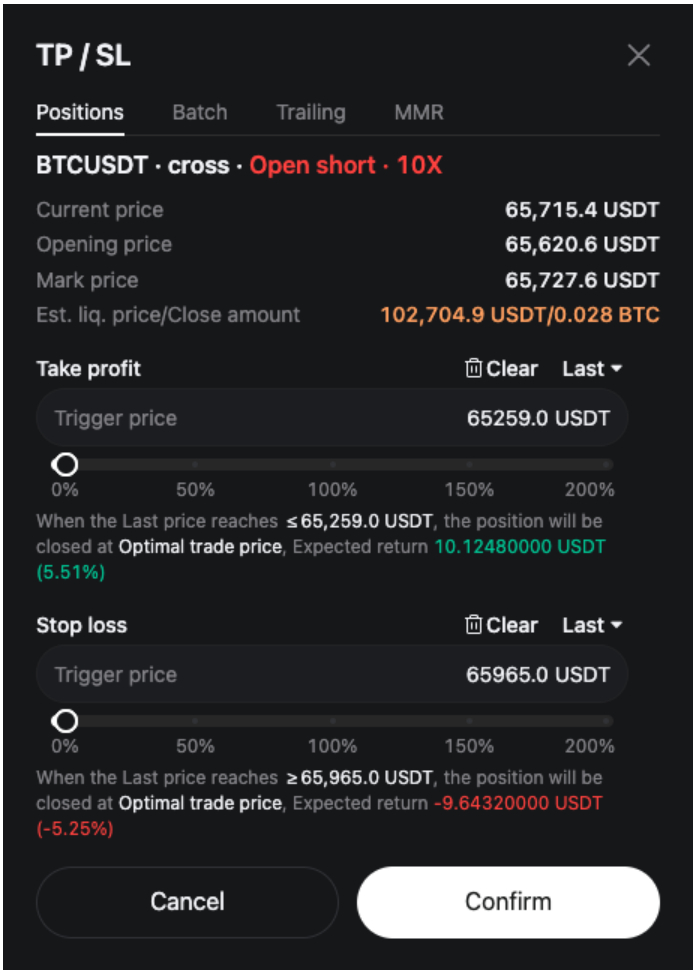


Figure 37. Position information. Source: own processing.

Figure 38: BTCUSDT. Source: own processing.

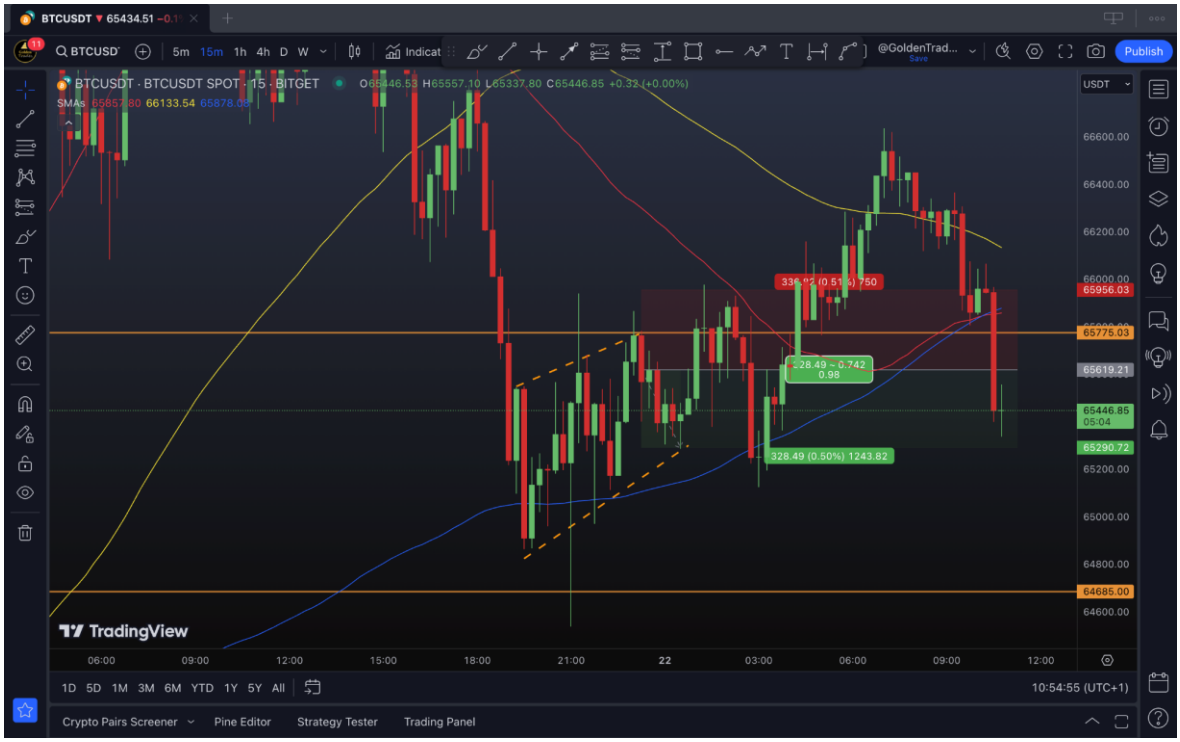


Figure 39: BTCUSDT. Source: own processing.

Trade №3: Price is in a bearish trend. A symmetrical triangle pattern has formed, confirming the bearish trend. Trade closed at a profit.

Figure 40: BTCUSDT. Source: own processing.

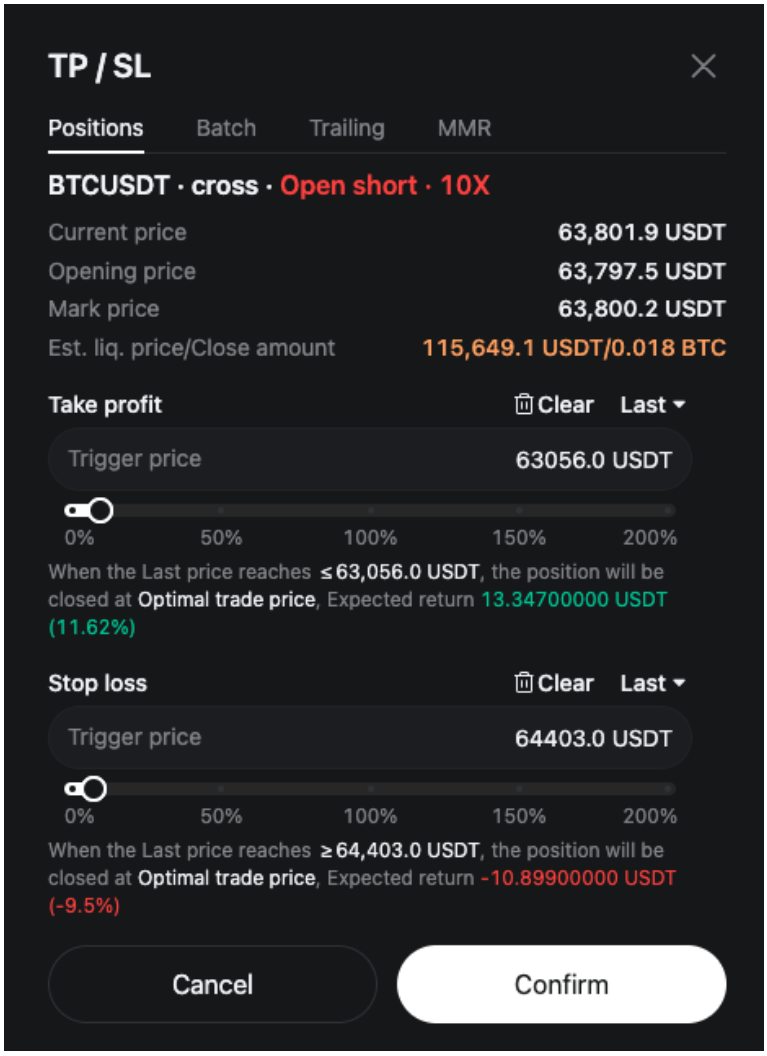


Figure 41: Position information. Source: own processing.

Figure 42: BTCUSDT. Source: own processing.

Trade №4: The price was above all Moving Averages and bounced upwards from a major support level. However, the trade was closed at breakeven, since the price eventually bounced from a resistance level and started going down again. The trade was fully closed at breakeven with 0 profit and that was a good decision because the price then reached the stop-loss level.

Figure 43: BTCUSDT. Source: own processing.

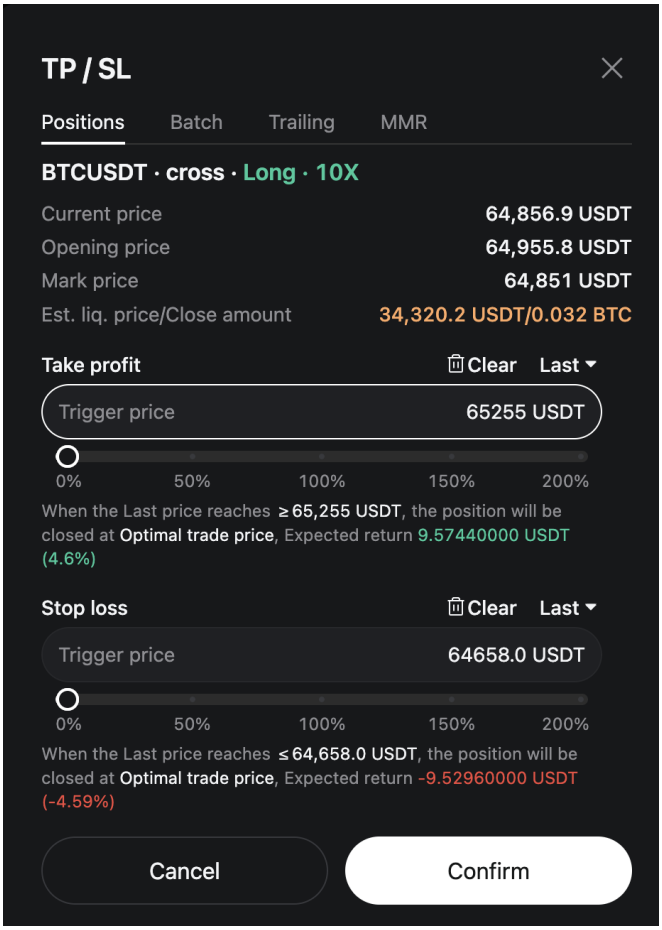


Figure 44: Position information. Source: own processing.

Figure 45: BTCUSDT. Source: own processing.

Trade №5: Clear bullish trend with increasing volume and Symmetrical Triangle pattern. Entry into the trade was a bit late, and the take profit level also had to be adjusted under the resistance line, so the risk/reward ratio is not ideal, but the trade was closed at the take profit level.

Figure 46: BTCUSDT. Source: own processing.

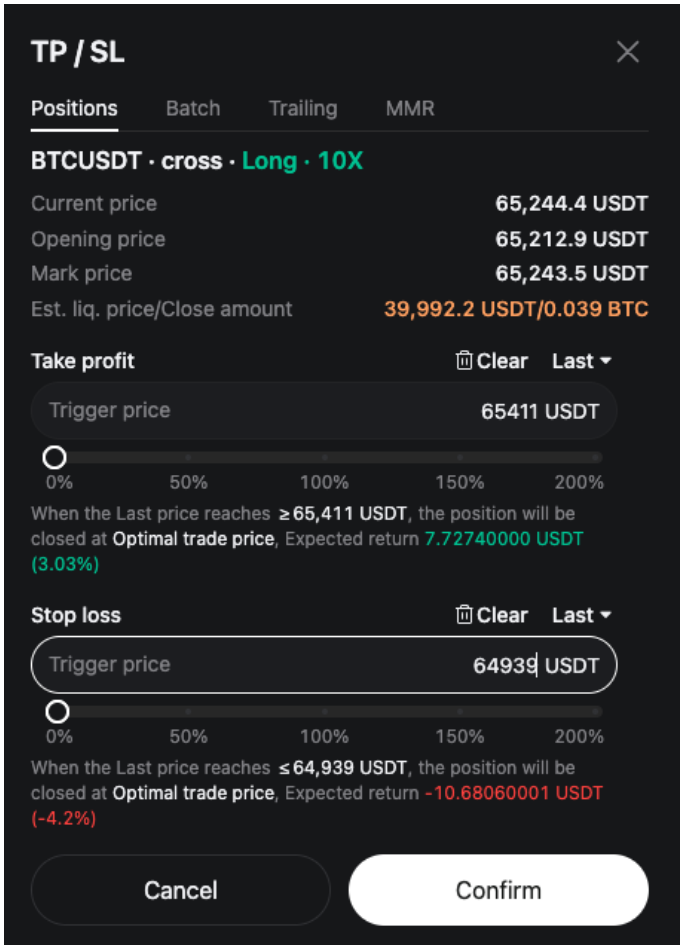


Figure 47: Position information. Source: own processing.

Figure 48: BTCUSDT. Source: own processing.

Trade №6: Clear bullish trend, and the price bounced off the support line and the SMA-50 line. The RSI indicator does not suggest overbought conditions, but the trade was closed at the stop loss after the price broke the resistance level and entered a bearish trend.

Figure 49: BTCUSDT. Source: own processing.

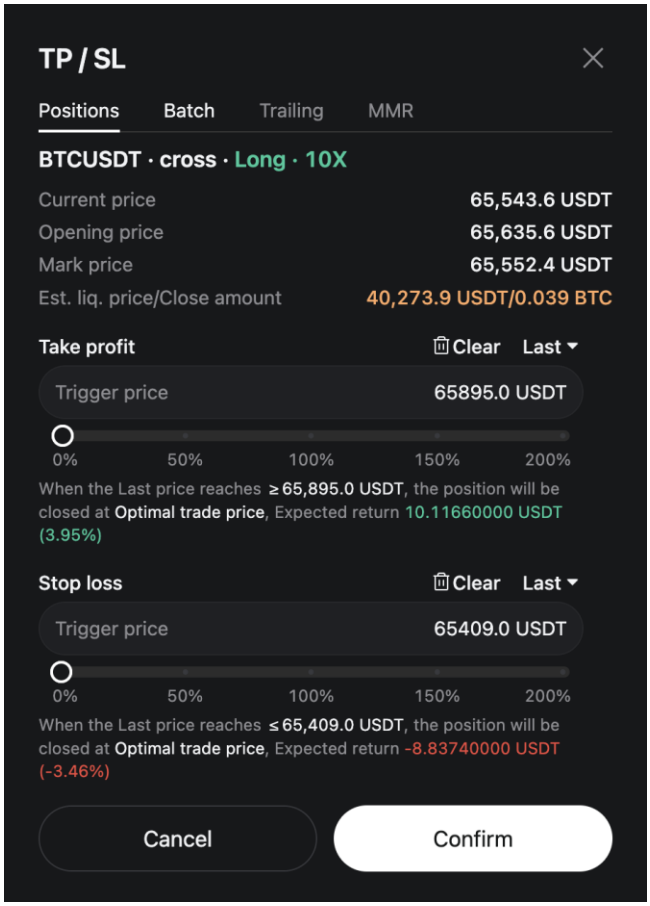


Figure 50: Position information. Source: own processing.

Figure 51: BTCUSDT. Source: own processing.

Trade №7: Bullish trend, price above all Moving Averages, and the price is consolidating below the resistance level and attempting to break it. The trade achieved the take-profit level.

Figure 52: BTCUSDT. Source: own processing.

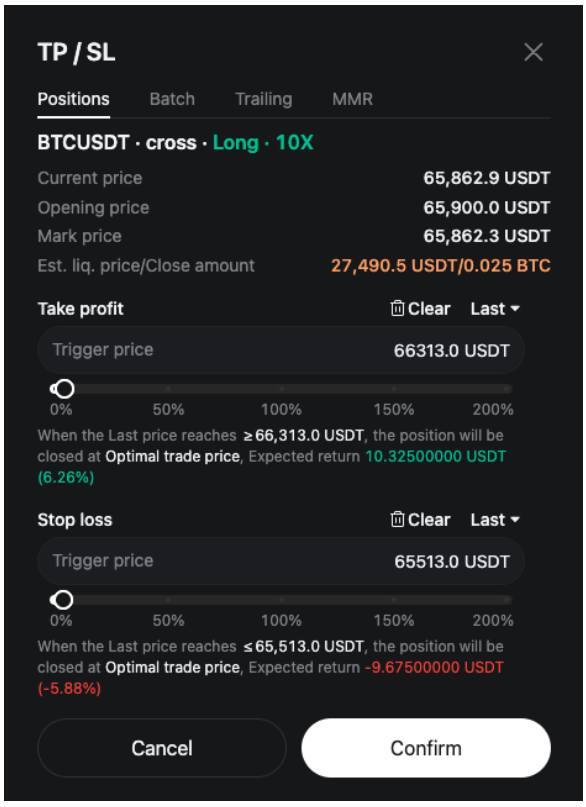


Figure 53: Position information. Source: own processing.

Figure 54: BTCUSDT. Source: own processing.

Trade №8: Bullish trend with a symmetrical triangle and price above all three Simple Moving Averages, the volume is increasing on the price breakout which confirms the bullish bias. Achieved take-profit.

Figure 55: ETHUSDT. Source: own processing.

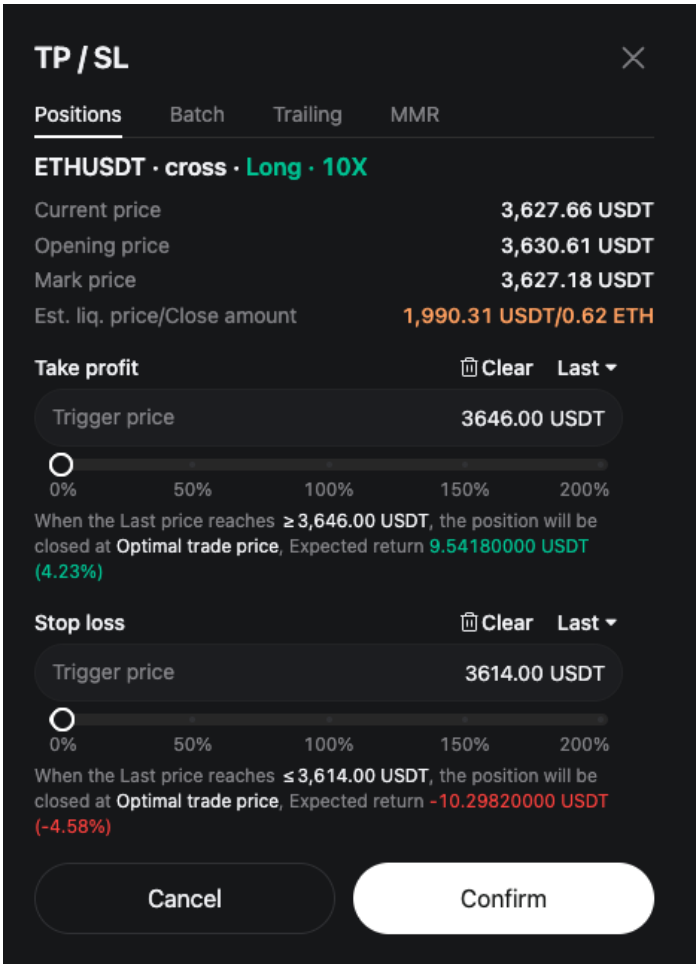


Figure 56: Position information. Source: own processing.

Figure 57: ETHUSDT. Source: own processing.

Trade №9: Uptrend, descending triangle pattern (which is also a bullish sign in an uptrend). There's also a Moving Average Crossover happening on the chart, the take-profit level was set slightly higher than the 1:1 RRR (risk-to-reward ratio) due to the resistance level nearby. Closed at a profit. It's also worth noting that the price immediately started moving down after reaching the take-profit level, so the take-profit level was chosen perfectly.

Figure 58: BTCUSDT. Source: own processing.

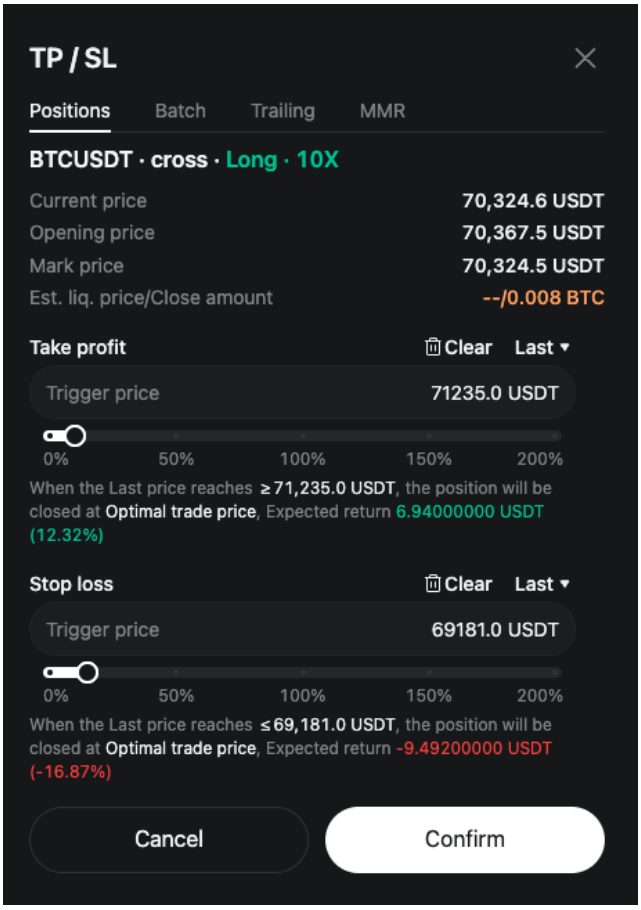


Figure 59: Position information. Source: own processing.

Figure 60: BTCUSDT. Source: own processing.

Trade №10: Double Top formation on the 4H timeframe, indicating a potential price reversal. On the 15-minute timeframe, the price has broken below the support level and is trading below all Moving Averages, with the RSI indicator showing a bearish divergence. However, the price ultimately reversed back up, and the trade was closed at a small loss at the price of 70050.

Figure 61: BTCUSDT. Source: own processing.

Figure 62: BTCUSDT. Source: own processing.

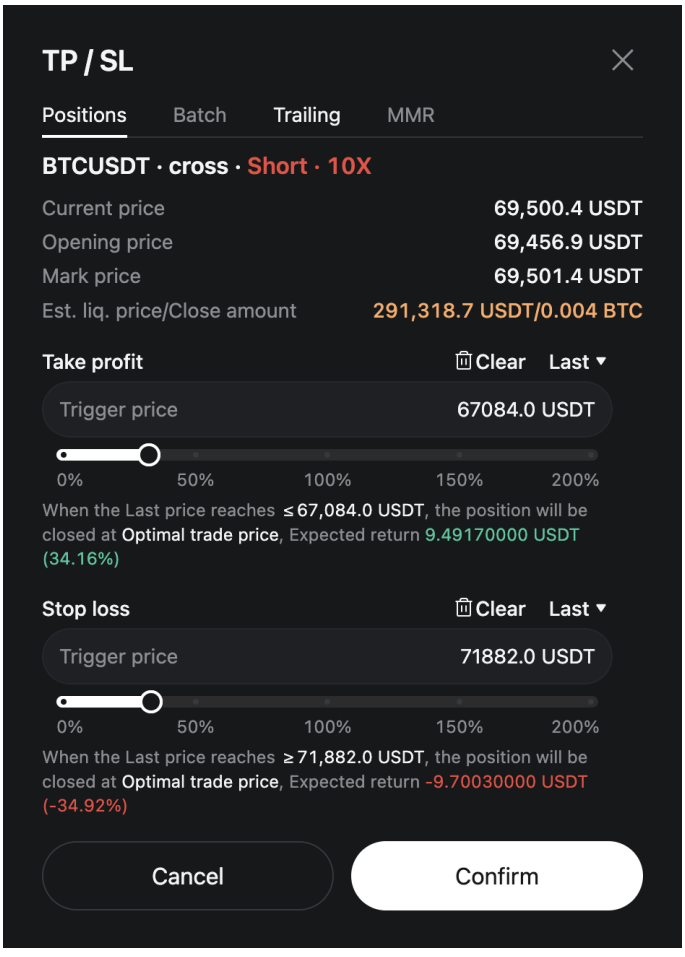


Figure 63: Position information. Source: own processing.

Figure 64: BTCUSDT. Source: own processing.

Trade №11: Bullish trend along with an Ascending Triangle pattern, but then the price broke below the support level and moved downwards with decreasing volume. The decision was made to exit the trade at a loss of approximately 5 USDT.

Figure 65: BTCUSDT. Source: own processing.

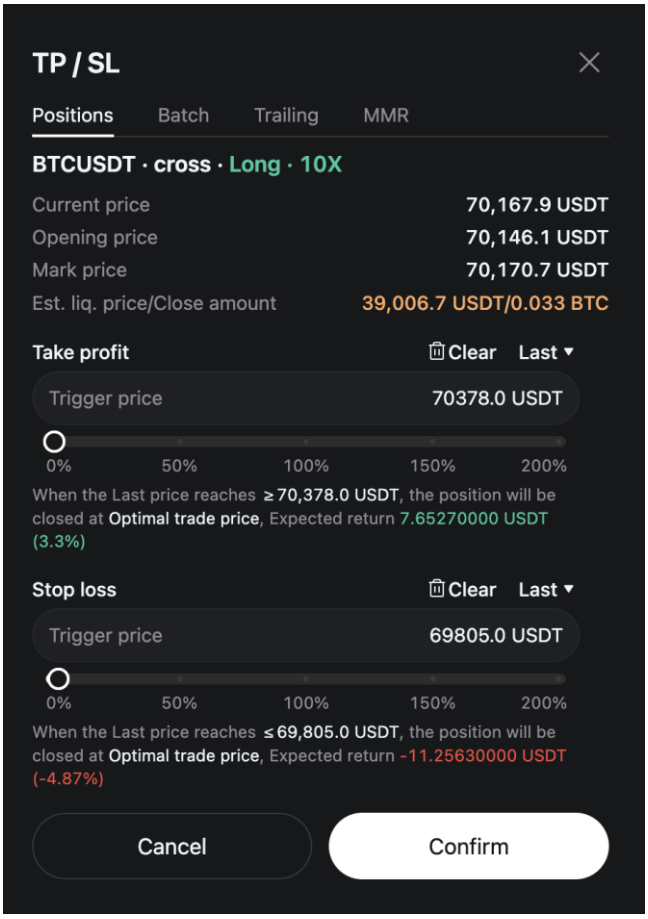


Figure 66: Position information. Source: own processing.

Figure 67: BTCUSDT. Source: own processing.

Trade №12: Uptrend along with a Symmetrical Triangle pattern, with the price also above all moving averages. The trade was closed at the perfect take profit level, and the price then immediately reversed downwards.

Figure 68: BTCUSDT. Source: own processing.

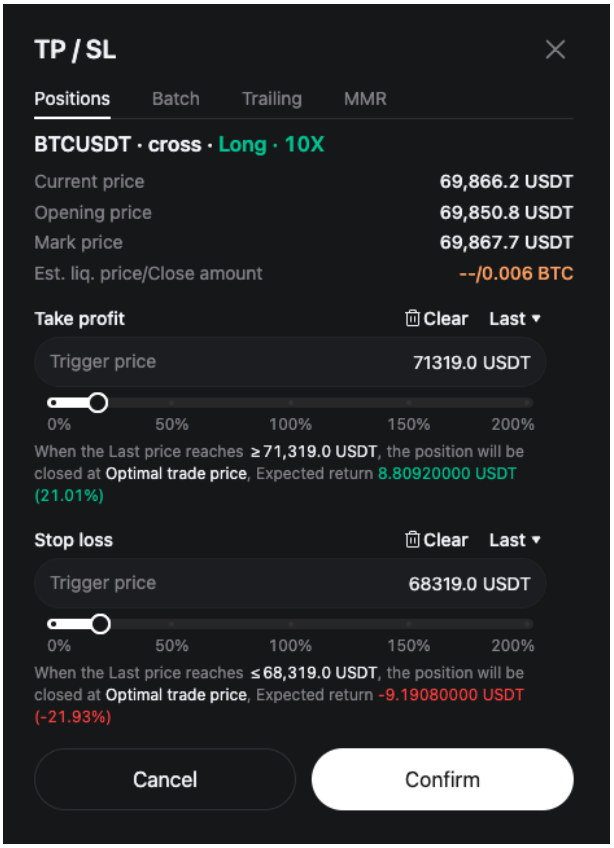


Figure 69: Position information. Source: own processing.

Figure 70: BTCUSDT. Source: own processing.

Trade №13: Uptrend alongside an Ascending Triangle pattern, with the price also above all moving averages. The RSI indicator is in the overbought area, but has not yet entered the overbought zone. The trade was closed at the perfect take profit level, and the price then immediately reversed downwards.

Figure 71: ETHUSDT. Source: own processing.

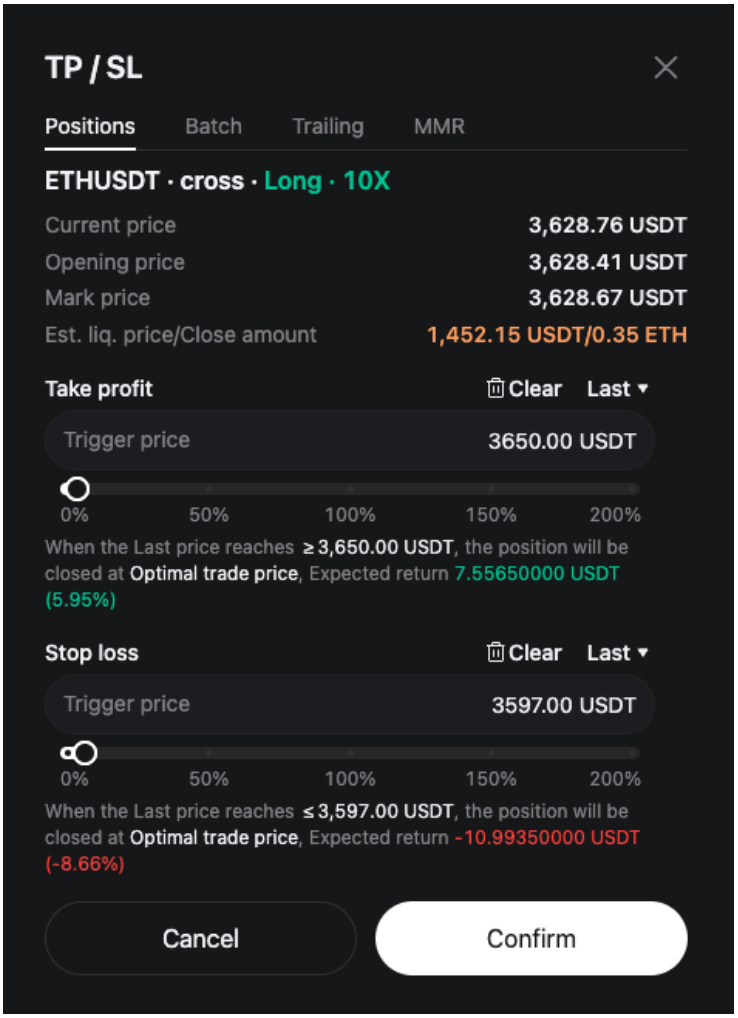


Figure 72: Position information. Source: own processing.

Figure 73: ETHUSDT. Source: own processing.

Trade №14: Bearish trend along with a Symmetrical Triangle pattern, with the price also below all moving averages, indicating a strong bearish trend. At the moment of the triangle breakdown downwards, there is an increase in trading volume, which confirms the bearish bias. The trade was closed at a profit.

Figure 74: BTCUSDT. Source: own processing.

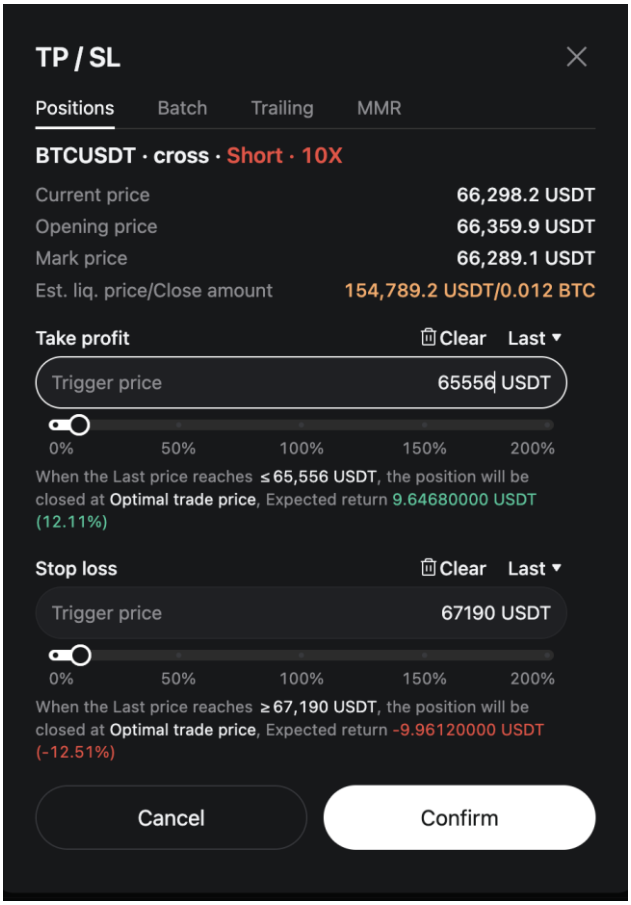


Figure 75: Position information. Source: own processing.

Figure 76: BTCUSDT. Source: own processing.

Trade №15: Uptrend with the price consolidating near a strong resistance level and with a significant increase in trading volume. The trade was closed in profit.

Figure 77: BTCUSDT. Source: own processing.

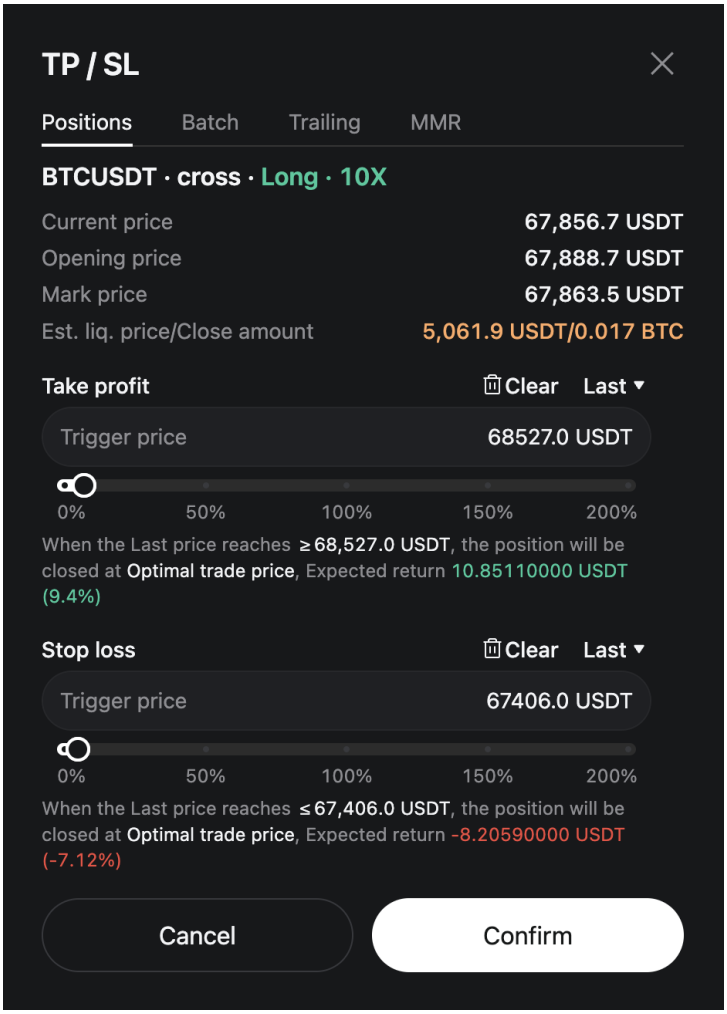


Figure 78: Position information. Source: own processing.

Figure 79: BTCUSDT. Source: own processing.

Trade №16: Uptrend with a Symmetrical Triangle pattern, price above all Moving Averages. The trade was closed at a profit.

Figure 80: BTCUSDT. Source: own processing.

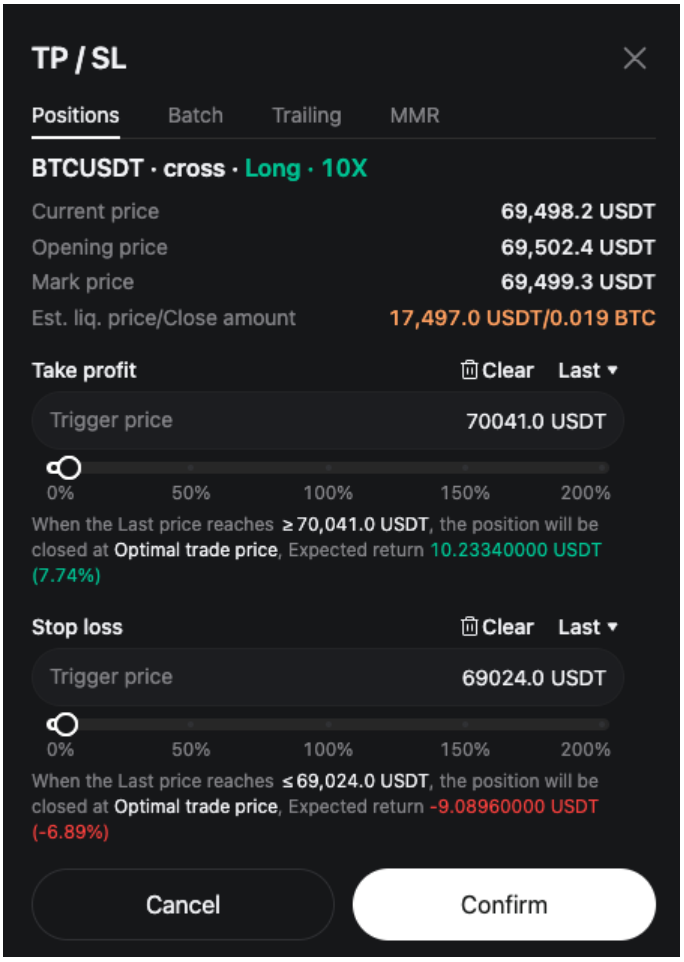


Figure 81: Position information. Source: own processing.

Figure 82: BTCUSDT. Source: own processing.

Trade №17: Bullish trend, and the price broke through a strong resistance level with high trading volume, but the RSI indicator suggests overbought conditions. Nevertheless, the trade was opened as there were more bullish signals, and only the RSI was warning of a potential reversal. However, the trade was ultimately closed at the stop-loss level.

Figure 83: BTCUSDT. Source: own processing.

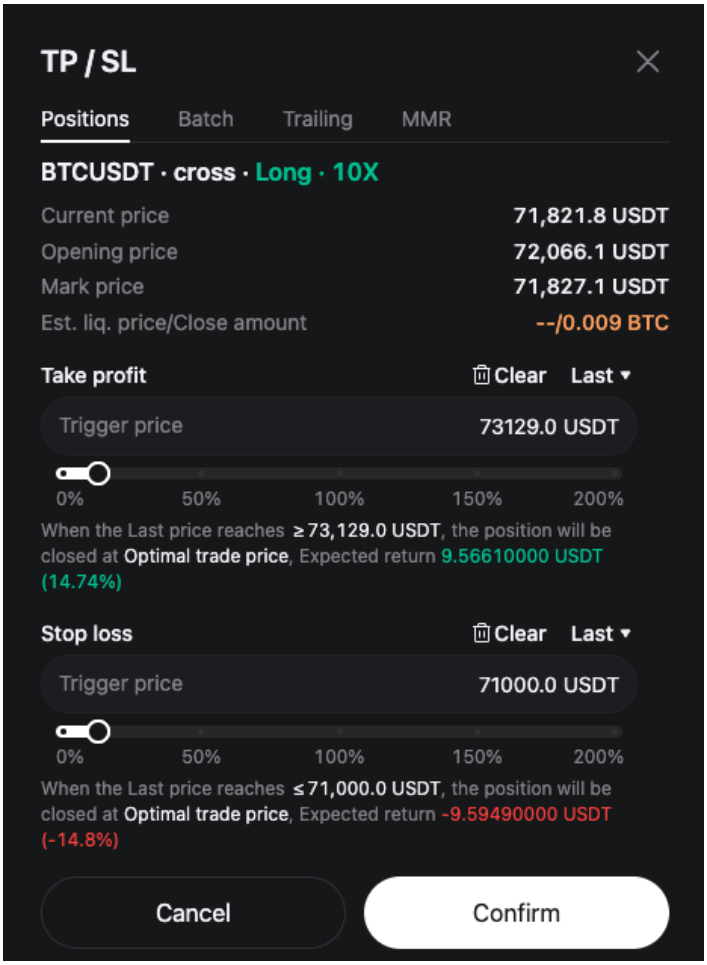


Figure 84: Position information. Source: own processing.

Figure 85: BTCUSDT. Source: own processing.

Trade №18: Uptrend with a Symmetrical Triangle formation, with the price also above all Moving Averages. The trade was closed at the take-profit level.

Figure 86: ETHUSDT. Source: own processing.

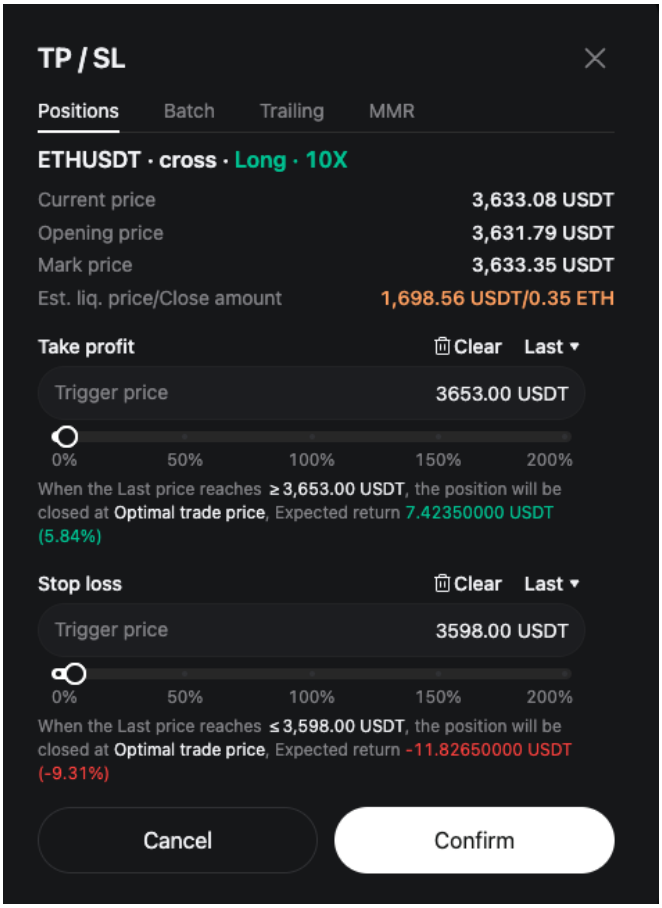


Figure 87: Position information. Source: own processing.

Figure 88: ETHUSDT. Source: own processing.

6.2 Results

Table 1: List of trades

Trade #	Date & Time (UTC)	Type	Instrument	Position Size	Average Open/Close Price	Realized P&L, USDT	Net Profits, USDT	Fees, USDT
1	2024-03-20 16:16:01	Open long	ETHUSDT	0.45	3345.44	0.00	0.00	-0.90
	2024-03-20 16:32:54	Close long	ETHUSDT	0.22	3366.54	4.64	4.20	-0.44
	2024-03-20 16:32:54	Close long	ETHUSDT	0.23	3366.54	4.85	4.39	-0.46
2	2024-03-22 00:02:23	Open short	BTCUSDT	0.028	65620.6	0.00	0.00	-1.10
	2024-03-22 01:33:18	Close short	BTCUSDT	0.028	65431.6	5.29	4.19	-1.10
3	2024-03-22 20:52:50	Open short	BTCUSDT	0.018	63797.5	0.00	0.00	-0.69
	2024-03-22 23:11:38	Close short	BTCUSDT	0.018	63049	13.47	12.79	-0.68
4	2024-03-23 23:35:35	Open long	BTCUSDT	0.032	64955.8	0.00	0.00	-1.25
	2024-03-23 23:51:13	Close long	BTCUSDT	0.032	64956	0.01	-1.24	-1.25
5	2024-03-24 13:47:28	Open long	BTCUSDT	0.006	65211	0.00	0.00	-0.23

Trade #	Date & Time (UTC)	Type	Instrument	Position Size	Average Open/Close Price	Realized P&L, USDT	Net Profits, USDT	Fees, USDT
	2024-03-24 13:47:28	Open long	BTCUSDT	0.033	65213.2	0.00	0.00	-1.29
	2024-03-24 14:03:18	Close long	BTCUSDT	0.039	65428.3	8.40	6.87	-1.53
6	2024-03-24 18:21:52	Open long	BTCUSDT	0.039	65635.6	0.00	0.00	-1.54
	2024-03-24 18:48:26	Close long	BTCUSDT	0.039	65404.5	-9.01	-10.54	-1.53
7	2024-03-24 21:55:10	Open long	BTCUSDT	0.025	65900	0.00	0.00	-0.99
	2024-03-24 22:12:26	Close long	BTCUSDT	0.025	66306.8	10.17	9.18	-0.99
8	2024-03-25 21:36:45	Open long	ETHUSDT	0.62	3630.61	0.00	0.00	-1.35
	2024-03-25 22:00:20	Close long	ETHUSDT	0.62	3646.01	9.55	8.19	-1.36
9	2024-03-27 14:02:15	Open long	BTCUSDT	0.008	70367.5	0.00	0.00	-0.34
	2024-03-27 15:11:14	Close long	BTCUSDT	0.008	71234.6	6.94	6.59	-0.34
10	2024-03-29 21:36:55	Open short	BTCUSDT	0.003	69452.6	0.00	0.00	-0.13
	2024-03-29 21:38:51	Open short	BTCUSDT	0.001	69469.9	0.00	0.00	-0.04
	2024-03-30 10:22:21	Close short	BTCUSDT	0.004	70050.1	-2.37	-2.54	-0.17
11	2024-03-30 13:31:30	Open long	BTCUSDT	0.033	70146.1	0.00	0.00	-1.39
	2024-03-30 20:45:53	Close long	BTCUSDT	0.033	69965.7	-5.95	-6.41	-0.46
12	2024-03-30 21:37:59	Open long	BTCUSDT	0.006	69850.8	0.00	0.00	-0.25
	2024-03-31 20:50:31	Close long	BTCUSDT	0.006	71317.5	8.80	8.54	-0.26
13	2024-03-31 20:00:52	Open long	ETHUSDT	0.35	3628.41	0.00	0.00	-0.76
	2024-03-31 20:39:59	Close long	ETHUSDT	0.35	3650.24	7.64	6.87	-0.77
14	2024-04-02 10:51:20	Open short	BTCUSDT	0.012	66359.9	0.00	0.00	-0.48
	2024-04-02 12:48:55	Close short	BTCUSDT	0.012	65550.2	9.72	9.24	-0.47
15	2024-04-04 18:55:28	Open long	BTCUSDT	0.017	67888.7	0.00	0.00	-0.69

Trade #	Date & Time (UTC)	Type	Instrument	Position Size	Average Open/Close Price	Realized P&L, USDT	Net Profits, USDT	Fees, USDT
	2024-04-04 19:51:21	Close long	BTCUSDT	0.017	68556.7	11.36	10.66	-0.70
16	2024-04-07 10:54:03	Open long	BTCUSDT	0.019	69502.4	0.00	0.00	-0.79
	2024-04-07 18:18:52	Close long	BTCUSDT	0.019	70052.5	10.45	9.65	-0.80
17	2024-04-08 11:03:59	Open long	BTCUSDT	0.009	72066.1	0.00	0.00	-0.39
	2024-04-09 03:10:33	Close long	BTCUSDT	0.009	70956.6	-9.99	-10.37	-0.38
18	2024-04-08 13:28:29	Open long	ETHUSDT	0.35	3631.79	0.00	0.00	-0.76
	2024-04-08 14:10:45	Close long	ETHUSDT	0.35	3653.55	7.62	6.85	-0.77

Source: own processing according to Bitget.

Table 2: Final results

Total Trades	18
Breakeven Trades	1
Winning Trades	13
Losing Trades	3
Win Ratio	72.22%
Realized Profit	$118.90
Realized Loss	$17.34
Total Comission paid	$29.83
Total Net Profit	$71.73
Initial Investment	$1,000.00
Investment After Trading	$1,071.73
ROI	7.17%
Time Spent	22 days
Montly ROI, if ROI remains same	9.78%
	117.36%

Yearly ROI, if ROI remains same (no compounding)	

Source: own processing according to Bitget.

6.3 Analyzing the effectiveness of the developed trading strategy

The final trading results after implementing improvements to the developed trading strategy have faced major improvements compared to results gathered from backtesting the strategy. An overall win ratio of 72.2% was achieved with 13 winning trades out of 18, which is significantly higher than the backtesting results (52%). During backtesting, the risk-reward setup was strictly 1:1, which may have limited profitability on winning trades.

The initial goal to outperform the return of the S&P 500 index (10.2% a year) was vastly exceeded with a substantial margin, generating 9.78% a month and 117.36% a year (without compounding) with the current trading strategy. It is important to specify that over the span of one year, the strategy may not yield exactly the same results, as this will depend on many factors, such as market phases, the overall trend of the cryptocurrency market, geopolitical situations around the world, and many other factors. For this period, at which time the strategy was tested on historical data, after applying improvements and then applied to real trading, it can be confidently said that everything was done correctly and very fascinating and impressive results were achieved.

The enhancements made to the trading strategy, particularly the adjustments to the take-profit and stop-loss settings considering the support and resistance levels, and the addition of longer period SMAs (100 and 200) have positively impacted the trading outcomes, reducing the frequency of stop-loss hits and false trend reversal signals from the SMA-50 alone.

Trading after the strategy adjustments shows a net profit of $71.73 from an initial investment of $1000, which translates to a 7.17% return on investment (ROI) over 22 days. If this ROI remained consistent, it could potentially annualize to a substantial 117.36%, although such a linear projection is optimistic and not without risks.

It should also be noted that in order to have more accurate key metrics, it is necessary to conduct more trades. The more trading transactions, the more accurate the results of the trading strategy performance will be. Unfortunately, starting from around April 10th, the cryptocurrency market began to be very volatile and unpredictable, which was further

exacerbated by the escalation of the conflict in the Middle East between Israel and Iran. During these days, it was impossible to find viable trades due to the extreme unpredictability of the markets.

While the initial results are promising, it's crucial to continue monitoring and adjusting the strategy based on ongoing market conditions and performance analysis to ensure its sustainability and scalability. Market conditions change. What works well in one phase may need adjustment in another, which has been proven during the last days of the trading phase and it’s clear that the strategy should be adjusted considering geopolitcal conditions.

7 SUMMARY OF THE PRACTICAL PART

In the practical part of this bachelor's thesis, the theoretical foundations from the previous section are applied to create a personal trading strategy. For backtesting the strategy, Bitcoin and Ethereum were chosen based on factors such as high liquidity, relatively low volatility, and availability on exchanges.

After establishing the necessary goals and objectives, a trading strategy was developed based on widely used technical analysis strategies. The trading strategy utilized the Simple Moving Average to identify and confirm trends, the Relative Strength Index to detect overbought and oversold areas and reversal points. Trend lines were used to delineate the current trends of the asset, support and resistance levels to identify an entry point, and chart patterns to further confirm price movement or identify its reversal.

Practical testing of the strategy on historical data not only confirmed its effectiveness but also identified potential improvements. Subsequently, after backtesting, the strategy was also adjusted to regulate the take-profit point considering the nearby support and resistance levels that might prevent the price from reaching the target. Two additional moving average lines with periods of 100 and 200 were added to the SMA.

An Excel calculator was developed for the proper calculation of the position size for trades, which allowed for the necessary volume of the position to be calculated in seconds to avoid losing more than 1% in case of a stop-loss, and it facilitated timely position entry without the need for manual calculations.

Further, the real application of the strategy in the market confirmed its ability to adapt to changing conditions and maintain stable profitability. Bitget was chosen as the trading platform. After applying improvements to the trading strategy, trading operations on the exchange resulted in a total of 7.17% ROI or $71.73 from the initial $1000 allocated for trading. These results significantly exceeded the initial goal of beating the average annual profitability of the S&P 500 index over the last 30 years. This goal was surpassed by approximately 10.5 times, with the annual ROI of the developed trading strategy, assuming market conditions and profitability are maintained, amounting to 117.36%. These results demonstrate not only the practical applicability of the trading strategy but also its potential for further research and improvements.

The main conclusion of the practical part is that with proper setup and management, the developed trading strategy can be effectively used to trade digital assets, yielding significant profits at a moderate level of risk.

CONCLUSION

In the course of this work various trading strategies have been discovered as well as all the necessary elements to create the own trading strategy designed to work in the cryptocurrency market. The work in this bachelor's thesis is not only theoretical foundations, but also the practical application of this knowledge to create the own trading strategy, its backtesting and later application.

The theoretical part of the bachelor's thesis allowed to consider in detail and systematize various methods of technical analysis. Such indicators as Volume, Relative Strenght Index (RSI), Moving Averages (SMA) were considered. Trend analysis, esistance and support levels and chart patterns also play an important role. These tools are the necessary knowledge base for entering the world of trading.

The practical part of the work demonstrated how theoretical knowledge can be applied in practice, and successfully. After formulating the own trading strategy and combining all the above-mentioned trading methods, the resulting trading strategy was subsequently tested on historical data, improved based on the basis of key-metrics from the tests and applied with even greater success in real trading conditions with one thousand American dollars allocated for this purpose. After the trading results, the following key results were achieved:

Time spent: 22 days

Win ratio: 72.22%

Net Profit: $71.73

ROI: 7.17%

These results significantly surpassed the initial goal of beating the average annual profitability of the S&P 500 index over the last 30 years, which is considered a success and can be regarded as a goal achieved and even greatly exceeded. This once again proves that with a competent approach, a well worked out plan, and taking into account the historical data it is possible to achieve excellent results in trading, while at the same time managing risks.

The main conclusion of this work is that with proper research, development, and testing, a trading strategy based on technical analysis can be obtained that meets the set goals. At the same time, this strategy will fully follow the envisioned risk management, which is one of the key factors in successful trading.

In conclusion, the results of this bachelor's thesis can serve as a basis for further study and development of trading strategies in the digital asset market, providing both theoretical and practical value for traders and investors seeking to increase their profitability while optimizing risks.

BIBLIOGRAPHY

AMADEO, Kimberly, 2022. *The S&P 500 and How It Works*. Online. The balance. Available at: https://www.thebalancemoney.com/what-is-the-sandp-500-3305888. [cited 2024-03-15].

An Introduction to Oscillators, 2022. Online. Investopedia. Available at: https://www.investopedia.com/articles/technical/070301.asp. [cited 2024-02-20].

AZIZ, Andrew, 2022. *How to Day Trade for a Living: A Beginner's Guide to Trading Tools and Tactics, Money Management, Discipline and Trading Psychology*. Independently published. ISBN 978-1-53-558595-8.

Bybit Trading Fee Structure, 2024. Online. Bybit. Available at: https://www.bybit.com/en/help-center/article/Trading-Fee-Structure. [cited 2024-03-05].

CHAN, Lawrence, 2018. *The Art of Chart Reading: A Complete Guide for Day Traders and Swing Traders of Forex, Futures, Stock and Cryptocurrency Markets*. Epub. Independently published.

DEVCIC, John, 2021. *Simple Moving Averages Make Trends Stand Out*. Online. Investopedia. Available at: https://www.investopedia.com/articles/technical/052201.asp#:~:text=Once%20a%20moving%20average%20is,stock%20is%20in%20a%20downtrend. [cited 2024-02-20].

EDELMAN, Ric, 2022. *The Truth About Crypto: A Practical, Easy-to-Understand Guide to Bitcoin, Blockchain, NFTs, and Other Digital Assets*. Epub. Simon & Schuster. ISBN 978-1-66-800232-2.

EPSTEIN, Lita and ROZE, Grayson D., 2023. *Trading For Dummies*. 5th. ed. New Jersey: For Dummies. ISBN 978-1-39-416148-5.

FARLEY, Alan, 2022. *Early Warning Signs That Function as Exit Indicators for a Trade*. Online. Investopedia. Available at: https://www.investopedia.com/articles/markets/010816/3-early-warning-signs-you-can-use-exit-positions.asp. [cited 2024-02-25].

Fee schedule. Online. Bitget. Available at: https://www.bitget.com/fee.

Fees & Transactions Overview. Online. Binance. Available at: https://www.binance.com/en/fee/schedule/. [cited 2024-02-25].

FERNANDO, Jason, 2024. *Relative Strength Index (RSI) Indicator Explained With Formula*. Online. Investopedia. Available at: https://www.investopedia.com/terms/r/rsi.asp. [cited 2024-02-20].

FITSCHEN, Keith, 2013. *Building Reliable Trading Systems: Tradable Strategies That Perform As They Backtest and Meet Your Risk-Reward Goals*. New Jersey: Wiley. ISBN 978-1-11-852874-7.

GAURAV, Roy, 2023. *What is a Centralized Cryptocurrency Exchange (CEX)?* Online. Ledger Academy. Available at: https://www.ledger.com/academy/topics/crypto/what-is-a-centralized-cryptocurrency-exchange-cex. [cited 2024-02-25].

HAYES, Adam, 2024. *How to Spot Key Stock Chart Patterns*. Online. Investopedia. Available at: https://www.investopedia.com/articles/technical/112601.asp. [cited 2024-02-20].

HOUGAARD, Tom, 2022. *Best Loser Wins*. Epub. Harriman House. ISBN 978-0-85-719822-8.

How to Identify Entry and Exit Points in Intraday Trading, 2022. Online. Upstox. Available at: https://upstox.com/market-talk/how-to-identify-entry-and-exit-points/. [cited 2024-03-13].

How Uniswap works. Online. Uniswap. Available at: https://docs.uniswap.org/contracts/v2/concepts/protocol-overview/how-uniswap-works#:~:text=In%20practice%2C%20Uniswap%20applies%20a,their%20portion%20of%20total%20reserves. [cited 2024-03-05].

KIRKPATRICK II, Charles and DAHLQUIST, Julie, 2015. *Echnical Analysis: The Complete Resource for Financial Market Technicians*. 3rd. ed. Upper Saddle River: FT Press. ISBN 978-0-13-413704-9.

KRANTZ, Matthew, 2023. *Fundamental Analysis For Dummies*. 3rd ed. Hoboken: For Dummies. ISBN 978-1-39-415969-7.

LEBRON, Agustin, 2019. *The Laws of Trading: A Trader's Guide to Better Decision-Making for Everyone*. New Jersey: Wiley. ISBN 978-1-11-957421-7.

MACMILLAN, Palgrave, 2022. *Cryptocurrency Compliance and Operations: Digital Assets, Blockchain and DeFi*. New York: Palgrave Macmillan. ISBN 978-3-03-087999-0.

Maker Fees and Taker Fees in Crypto Trading, 2022. Online. LCX. Available at: https://www.lcx.com/maker-fees-and-taker-fees-in-crypto-

trading/#:~:text=Maker%20Fees%20are%20usually%20paid,on%20behalf%20of%20someone%20else. [cited 2024-03-05].

MAUNSELL, Tim. *How to Know When to Close a Trade?* Online. BlueberyyMarkets. Available at: https://blueberrymarkets.com/market-analysis/news/how-to-know-when-to-close-a-trade/. [cited 2024-02-20].

MILLER, Frank, 2022. *SUPPLY AND DEMAND TRADING: How To Master The Trading Zones*. Independently published. ISBN 979-8-43-913204-1.

MITCHELL, Cory, 2021. *Trend Trading: Definition and How Strategy Aims For Profit*. Online. Investopedia. Available at: https://www.investopedia.com/terms/t/trendtrading.asp. [cited 2024-02-26].

MITCHELL, Cory, 2024. *Historical Average Stock Market Returns for S&P 500 (5-year to 150-year averages)*. Online. TradeThatSwing. Available at: https://tradethatswing.com/average-historical-stock-market-returns-for-sp-500-5-year-up-to-150-year-averages/#:~:text=The%20average%20yearly%20return%20of%20the%20S%26P%20500%20is%2010.22,including%20dividends)%20is%207.5%25. [cited 2024-02-26].

OZELLI, Selva, 2022. *Sustainably Investing in Digital Assets Globally*. Epub. New Jersey: Wiley. ISBN 978-1-11-988562-7.

PERAMUNA, Prabuddha, 2023. *What is the difference between higher and lower timeframe in Forex trading? What are the pros and cons of each one?* Online. Linkedin. Available at: https://www.linkedin.com/pulse/what-difference-between-higher-lower-timeframe-forex-trading. [cited 2024-03-10].

PRING, Martin J., 2014. *Technical Analysis Explained*. 5th. ed. New York City: McGraw-Hill Education. ISBN 978-0-07-182517-7.

SCHABACKER, Richard, 2021. *Technical Analysis and Stock Market Profits (Harriman Definitive Edition)*. Petersfield: Harriman House. ISBN 978-0-85-719916-4.

SCHLOTMANN, Rolf and CZUBATINSKI, Moritz, 2019. *Trading: Technical Analysis Masterclass: Master the financial markets*. Offenbach: Independently published. ISBN 978-1-79-547185-5.

STABILE, Daniel T.; PRIOR, Kimberly A. and HINKES, Andrew M., 2020. *Digital Assets and Blockchain Technology*. Edward Elgar Pub. ISBN. 978-1-78-990743-8.

TEO, Rayner, 2021. *Price Action Trading Secrets: Trading Strategies, Tools, and Techniques to Help You Become a Consistently Profitable Trader*. Singapore: The National Library of Singapore. ISBN 978-9-81-146494-2.

The Ins and Outs of Decentralized Exchanges (DEXs). Online. Hedera. Available at: https://hedera.com/learning/decentralized-finance/decentralized-exchanges. [cited 2024-03-01].

Trading fee. Online. OKX. Available at: https://www.okx.com/fees. [cited 2024-02-25].

Trading Fees. Online. Coinbase Pro. Available at: https://pro.coinbase.com/fees. [cited 2024-02-25].

Trading Pin Bars for Sats & Pips, 2020. Online. UNITY TRADING GROUP. Available at: https://www.unitytradinggroup.com/trading-pin-bars/. [cited 2024-02-25].

VAIDA, Bogdan, 2023. *Zero to Hero in Cryptocurrency Trading: Learn to trade on a centralized exchange, understand trading psychology*. Packt Publishing. ISBN 978-1-83-763128-5.

VIP Program. Online. Kucoin. Available at: https://www.kucoin.com/vip/privilege. [cited 2024-02-25].

WADE, Dexter and SIMERI, Flavio, 2022. *Day Trading in the 2020-2030 Decade: From Zero to Passive Income. Practical Guide for Newbies to Learn How to Trade Financial Markets (Forex, Cryptocurrency, Stocks, Options, Futures) in 11 Easy Steps*. Independently published. ISBN 979-8-21-590956-0.

What Are Automated Market Makers (AMM)?, 2023. Online. Cryptopedia. Available at: https://www.gemini.com/cryptopedia/amm-what-are-automated-market-makers. [cited 2024-03-10].

What is a CEX? Online. Bitcoin.com. Available at: https://www.bitcoin.com/get-started/what-is-a-cex/. [cited 2024-03-08].

What Is a Good Return on Investment (ROI)? (Plus Formula), 2023. Online. Indeed. Available at: https://www.indeed.com/career-advice/career-development/what-is-a-good-roi. [cited 2024-03-12].

What is trend trading? Online. Capital.com. Available at: https://capital.com/trend-trading. [cited 2024-02-13].

What's the Difference Between a CEX and a DEX?, 2022. Online. Binance Academy. Available at: https://academy.binance.com/en/articles/what-s-the-difference-between-a-cex-and-a-dex. [cited 2024-03-07].

ZATTI, Filippo and BARRESI, Rosa Giovanna, 2024. *Digital Assets and the Law: Fiat Money in the Era of Digital Currency*. Routledge. ISBN 978-1-03-219227-7.

LIST OF ABBREVIATIONS

15m – 15-minutes chart

1H – 1-hour chart

4H – 4-hour chart

5m – 5-minutes chart

AMM - Automated Market Maker

BIS - Bank for International Settlements

BTCUSDT – Bitcoin / USDT trading pair

CBDC - Central Bank Digital Currencies

CEX - Centralized Exchanges

DEX - Decentralized Exchanges

ERC-20 - Ethereum Request for Comments 20 (a token standard on the Ethereum blockchain)

ETHUSDT – Ethereum / USDT trading pair

MA- Moving Average

NFT - Non-Fungible Token

ROI – Return On Investment

RRR – Risk Reward Ratio

RSI - Relative Strength Index

SL – Stop-loss

SMA - Simple Moving Average

TP – Take-profit

LIST OF FIGURES

Figure 1: The trend. Source: Kirkpatrick II, Dahlquist, 2015, p.11 17
Figure 2: Trading Range Reversal. Source: Pring, 2014, p.117 18
Figure 3: Moving Average. Source: Millier, 2022. p.13 20
Figure 4: MSCIWorldStockIndex1987–200812-MonthMA. Source: Pring, 2014, p.230 ..21
Figure 5: iShares Brazil 2011–2012 Joint Trendline/MA Violations. Source: Pring, 2014, p.214 22
Figure 6: The RSI can be used during trend and sideways phases. Source: Schlotmann, Czubatinski, 2019, p. 92 24
Figure 7: RSI divergences may indicate a change in the trend direction in advance as they indicate decreasing momentum. Source: Schlotmann, Czubatinski, 2019, p. 95 25
Figure 8: A daily chart shows price and volume. Source: Epstein, Roze, 2023, p. 134 26
Figure 9: Double Bottom. Source: Vaida, 2023, P. 64 28
Figure 10: Double Top. Source: Vaida, 2023, P. 65 29
Figure 11: iH&S. Source: Vaida, 2023, P. 66 30
Figure 12: H&S. Source: Vaida, 2023, P. 67 31
Figure 13: Bull Flag. Source: Vaida, 2023, P. 68 32
Figure 14: Bear Flag. Source: Vaida, 2023, P. 68 33
Figure 15: Triangles. Source: Vaida 2023, P. 71 33
Figure 16: Triangles. Source: Vaida 2023, P. 71 34
Figure 17: Triangles. Source: Vaida 2023, P. 71 35
Figure 18: Triangles. Source: Vaida 2023, P. 71 35
Figure 19: Where to Place Your Stop Loss on Pin Bar Trades. Source: Trading Pin Bars for Sats & Pips, 2020 37
Figure 20: RISK MANAGEMENT: HOW TO CALCULATE 41
Figure 21: Fee Rate. Source: Fees & Transactions Overview 49
Figure 22: Fee Rate. Source: Fees & Transactions Overview 50
Figure 23: Tiers. Source: Trading Fees 51
Figure 24: Trading Fee Rate. Source: Bybit Trading Fee Structure, 2024 51
Figure 25: Regular users. Source: Trading fee 51
Figure 26: Regular users. Source: Trading fee. 52
Figure 27: Spot fees. Source: VIP Program. 52
Figure 28: Futures fees. Source: VIP Program. 52
Figure 29: Transaction fee explanation. Source: Fee schedule 53
Figure 30: Transaction fee explanation. Source: Fee schedule 53
Figure 31: Screenshot of position size Excel calculator. Own work. 63

Figure 32: Deposit of USDC on Bitget. Source: own processing. 69
Figure 33: ETHUSDT. Source: own processing. 71
Figure 34: Position information. Source: own processing. 71
Figure 35: ETHUSDT. Source: own processing. 72
Figure 36: BTCUSDT. Source: own processing. 72
Figure 37. Position information. Source: own processing. 73
Figure 38: BTCUSDT. Source: own processing. 73
Figure 39: BTCUSDT. Source: own processing. 74
Figure 40: BTCUSDT. Source: own processing. 74
Figure 41: Position information. Source: own processing. 75
Figure 42: BTCUSDT. Source: own processing. 75
Figure 43: BTCUSDT. Source: own processing. 76
Figure 44: Position information. Source: own processing. 77
Figure 45: BTCUSDT. Source: own processing. 77
Figure 46: BTCUSDT. Source: own processing. 78
Figure 47: Position information. Source: own processing. 79
Figure 48: BTCUSDT. Source: own processing. 79
Figure 49: BTCUSDT. Source: own processing. 80
Figure 50: Position information. Source: own processing. 81
Figure 51: BTCUSDT. Source: own processing. 81
Figure 52: BTCUSDT. Source: own processing. 82
Figure 53: Position information. Source: own processing. 82
Figure 54: BTCUSDT. Source: own processing. 83
Figure 55: ETHUSDT. Source: own processing. 83
Figure 56: Position information. Source: own processing. 84
Figure 57: ETHUSDT. Source: own processing. 84
Figure 58: BTCUSDT. Source: own processing. 85
Figure 59: Position information. Source: own processing. 86
Figure 60: BTCUSDT. Source: own processing. 86
Figure 61: BTCUSDT. Source: own processing. 87
Figure 62: BTCUSDT. Source: own processing. 88
Figure 63: Position information. Source: own processing. 88
Figure 64: BTCUSDT. Source: own processing. 89
Figure 65: BTCUSDT. Source: own processing. 89
Figure 66: Position information. Source: own processing. 90

Figure 67: BTCUSDT. Source: own processing. 90
Figure 68: BTCUSDT. Source: own processing. 91
Figure 69: Position information. Source: own processing. 91
Figure 70: BTCUSDT. Source: own processing. 92
Figure 71: ETHUSDT. Source: own processing. 92
Figure 72: Position information. Source: own processing. 93
Figure 73: ETHUSDT. Source: own processing. 93
Figure 74: BTCUSDT. Source: own processing. 94
Figure 75: Position information. Source: own processing. 95
Figure 76: BTCUSDT. Source: own processing. 95
Figure 77: BTCUSDT. Source: own processing. 96
Figure 78: Position information. Source: own processing. 97
Figure 79: BTCUSDT. Source: own processing. 97
Figure 80: BTCUSDT. Source: own processing. 98
Figure 81: Position information. Source: own processing. 99
Figure 82: BTCUSDT. Source: own processing. 99
Figure 83: BTCUSDT. Source: own processing. 100
Figure 84: Position information. Source: own processing. 101
Figure 85: BTCUSDT. Source: own processing. 101
Figure 86: ETHUSDT. Source: own processing. 102
Figure 87: Position information. Source: own processing. 102
Figure 88: ETHUSDT. Source: own processing. 103

LIST OF TABLES

Table 1: List of trades 103
Table 2: Final results 105