

# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## BACHELOR THESIS ASSIGNMENT

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Business Administration

Thesis title

**Blockchain Investments**

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### Objectives of thesis

The objective of my thesis is to evaluate cryptocurrencies, investigate them and compare those investments between each other. In this will be provided full analysis of Ethereum, Dogecoin and Chainlink coins. Take a look at the history of cryptocurrencies and make a prediction about future investment in these cryptocurrencies. This work will provide a decision is the cryptocurrency a good investment.

The information of those currencies will be taken from official whitepapers, verified websites and investment books.

### Methodology

All information will be taken from

Theoretical part will consist from history of blockchain technology, Price history and people that made big contribution on it, provide the information about technology of the blockchain. Main possible ways of investments into blockchain also be included.

Practical part will consist from Fundamental analysis of the cryptocurrencies which includes On-Chain metrics, Project metrics and Financial metrics involving NVT coefficient, MVRV coefficient etc., and Technical analysis of the charts including MACD indicator, Ema bollinger bands etc., In this work will be also presented some scenarios of what can happen with current amount of money in different ways of investing into Blockchain.

**The proposed extent of the thesis**

60 pages

**Keywords**

Block chain technology, Cryptocurrency , Investments

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**Recommended information sources**

- GRABOWSKI, M. *Cryptocurrencies : A Primer on Digital Money. [elektronický zdroj]* /. Milton: Taylor & Francis Group, 2019. ISBN 9780429510144.
- CHOWDHURY, N. *Inside Blockchain, Bitcoin, and Cryptocurrencies. [elektronický zdroj]* /. Milton: Auerbach Publishers, Incorporated, 2019. ISBN 9781000507706.
- MCMILLAN, M G. – PINTO, J E. – PIRIE, W L. – VENTER, G V D. *Investments : principles of portfolio and equity analysis*. Hoboken (NJ): Wiley, John Wiley & Sons, Inc., 2011. ISBN 978-0-470-91580-6.
- REILLY, F K. – BROWN, K C. *Analysis of investments & management of portfolios*. Australia: South-Western Cengage Learning, 2012. ISBN 9780538482486.
- TSAY, R S. *Analysis of financial time series*. Hoboken: John Wiley & Sons, 2010. ISBN 978-0-470-41435-4.
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## **Declaration**

I declare that I have worked on my diploma thesis titled "Blockchain Investments" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 15.03.2022

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I would like to thank Ing. Petr Procházka, Ph.D., MSc, for advice and support during my work on this thesis.

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# **Blockchain Investments.**

## **Abstract in English**

The topic of investment in blockchain is relevant because the cryptocurrency market is currently a very controversial place of investment. This work will reveal the question of whether to invest in cryptocurrency as well as some other aspects of blockchain investment. In this paper, these cryptocurrencies were chosen to uncover the cryptocurrency market from different sides. The cryptocurrency market can be a good tool for increasing capital in skilled hands. The cryptocurrency market cannot always be analyzed by a classical analysis of investment attractiveness. Therefore, the tools for the Analysis were chosen Fundamental and Technical Analyses.

## **Keywords:**

Blockchain, Technology, Cryptocurrency, Investments, Digital Currencies, Fundamental Analysis, Technical Analysis, Blockchain history, Staking, Crypto.

# **Analýza vybraných akcií.**

## **Abstrakt**

Téma investic do blockchainu je aktuální, protože trh s kryptoměny je v současnosti velmi kontroverzním místem investic. Tato práce odhalí otázku, zda investovat do kryptoměny, stejně jako některé další aspekty blockchainových investic. V tomto dokumentu byly tyto kryptoměny vybrány, aby odhalily trh s kryptoměny z různých stran. Trh s kryptoměny může být dobrým nástrojem pro navýšení kapitálu do šikovných rukou. Trh s kryptoměny nelze vždy analyzovat klasickou analýzou investiční atraktivity. Proto byly jako nástroje pro analýzu zvoleny Fundamentální a Technické analýzy.

## **Klíčová slova:**

Blockchain, Technologie, Kryptoměna, Investice, Digitální měny, Fundamentální analýza, Technická analýza, Historie blockchainu, Staking, Krypto.

# Table of Content

<b>1 Introduction.....</b>	<b>10</b>
<b>2 Objectives and Methodologies .....</b>	<b>11</b>
<b>3 Theoretical part.....</b>	<b>12</b>
3.1 History of Blockchain .....	12
3.2 First Digital Currencies. ....	13
3.3 First working cryptocurrencies .....	14
3.4 Bitcoin Price History.....	15
3.5 Blockchain conception .....	16
3.6 The structure of Blockchain technology. ....	17
3.7 Cryptocurrency.....	18
3.7.1 Cryptocurrency conception. ....	18
3.7.2 Types of Cryptocurrency .....	19
3.7.3 Cryptocurrency and Tokens .....	21
3.8 How to Invest in Cryptocurrencies.....	21
3.9 IPO, ICO, IEO, IDO, and STO .....	21
3.10 Advantages of Using ICO .....	22
3.12 Mining .....	22
3.13 Staking.....	23
<b>4 Practical Part.....</b>	<b>26</b>
4.1 Fundamental Analysis .....	26
4.1.1 On-Chain Metrics .....	26
4.1.2 Project Metrics.....	27
4.1.3 Financial Metrics.....	28
4.2 Technical Analysis .....	29
Simple Moving Average .....	29
Exponential Moving Average .....	30
Relative Strength Index.....	30
Moving Average Divergence Indicator.....	30
<b>4.3 Fundamental Analysis of Ethereum.....</b>	<b>31</b>
4.3.1 On-Chain Metrics .....	31
4.3.2 Financial Metrics.....	33
4.3.3 Project Metrics.....	34

<b>4.4 Technical Analysis of Ethereum .....</b>	<b>35</b>
MA indicator .....	35
RSI indicator .....	36
MACD indicator .....	37
<b>4.5 Fundamental Analysis of Doge Coin .....</b>	<b>38</b>
4.5.1 On-Chain Metrics .....	38
4.5.2 Financial Metrics .....	40
4.5.3 Project metrics .....	40
<b>4.6 Technical Analysis of Doge coin .....</b>	<b>41</b>
MA indicator .....	41
RSI indicator .....	42
MACD indicator .....	43
<b>4.7 Fundamental analysis of Chain-Link.....</b>	<b>44</b>
4.7.1 On-Chain metrics .....	44
4.7.2 Financial Metrics .....	45
4.7.3 Project metrics .....	46
<b>4.8 Technical Analysis of Chain-Link.....</b>	<b>46</b>
MA indicator .....	47
RSI indicator .....	48
MACD indicator .....	49
<b>4.9 Fundamental Analysis of Polkadot.....</b>	<b>50</b>
4.9.1 On Chain Metrics.....	50
4.9.2 Financial Metrics .....	51
4.9.3 Project Metrics.....	52
<b>4.10 Technical Analysis of Polkadot.....</b>	<b>53</b>
MA indicator .....	53
RSI indicator .....	54
MACD indicator .....	55
<b>5 Conclusion .....</b>	<b>56</b>
Ethereum .....	56
Doge Coin .....	56
Chain-Link.....	57
Polkadot .....	57
<b>6 References.....</b>	<b>58</b>



## Table of figures

Figure 1 Hashed blockchain described by Stornetta and Haber .....	13
Figure 2 Transaction Volume in Thousands of Ethereum .....	31
Figure 3 Number of Active Addresses of Ethereum.....	32
Figure 4 Hash Rate of Ethereum.....	32
Figure 5 MA indicator chart for Ethereum .....	35
Figure 6 RSI indicator chart for Ethereum .....	36
Figure 7 MACD indicator chart for Ethereum.....	37
Figure 8 Number of Transactions in thousands of Doge Coin .....	38
Figure 9 Number of Active Addresses of Doge Coin.....	39
Figure 10 Hash Rate of Dogecoin.....	40
Figure 11 MA indicator chart for Dogecoin .....	42
Figure 12 RSI indicator chart for Dogecoin .....	42
Figure 13 MACD indicator chart for Dogecoin.....	43
Figure 14 Number of Transactions of Chain-Link .....	44
Figure 15 MA indicator chart for Chain-link.....	47
Figure 16 RSI indicator chart for Chain-link.....	48
Figure 17 MACD indicator chart for Chain-link .....	49
Figure 18 Number of Transactions of Polkadot.....	50
Figure 19 Number of Active addresses of Polkadot .....	51
Figure 20 MA indicator chart for Polkadot.....	54
Figure 21 RSI indicator chart for Polkadot.....	54
Figure 22 MACD indicator chart for Polkadot .....	55

# 1 Introduction

Today, thin concepts like cryptocurrency, blockchain are becoming more and more common. More and more ordinary people and investors are interested in investing their savings in this direction. In this work, I'm going to try to figure out if it's possible to invest your assets profitably in the blockchain, what are the investment opportunities and options.

Until 30 years ago, no one even knew that the same blockchain, and the young Scott Stornetta and Stuart Haber only first described such technology as Time Stamp.

The cryptocurrency market has existed for less than 15 years, and its total capitalization has already amounted to 1.752 trilliards of dollars. Some cryptocurrencies are considered an economic miracle.

I chose this thesis because I sincerely believe in the success and future of Blockchain and the Crypto Market both in terms of security and earning opportunities.

## **2 Objectives and Methodologies**

### **2.1 Objectives of thesis**

The objective of my thesis is to evaluate cryptocurrencies, investigate them and compare those investments between each other. In this will be provided full analysis of Ethereum, Dogecoin, Chain-link and Polkadot coins. Take a look at the history of cryptocurrencies, blockchain and its technology and fundamentals.

This work also will provide predictions about price movements of those cryptocurrencies and answer the question whether those coins are good investment or not.

The information of those currencies will be taken from official whitepapers, verified websites and investment books.

### **2.2 Methodology**

Theoretical part will consist of history of blockchain technology, Price history and people that made big contribution on it, provide the information about technology of the blockchain. Main possible ways of investments into blockchain also be included. Practical part will consist of two main parts, Fundamental analysis and Technical Analysis. Fundamental analysis will provide information touching On-Chain metrics, Project metrics and Financial metrics involving NVT coefficient, MVRV coefficient and Stock to flow model. Those metrics will give us understanding of technology of project and their main purposes, give the answers whether those coins overvalued. Technical analysis of the charts including MA, RSI, and MACD indicator which would help us to predict the action of prices.

## **3 Theoretical part**

### **3.1 History of Blockchain**

It is considering that the name of technology and the age of blockchain is counting from the first Bitcoin appearing. Anyway, the term Block and Chain was introduced by the author of cryptocurrency protocol Bitcoin.

Satoshi Nakamoto realized the Blockchain Idea in the enforcement of the Bitcoin System in 2008. Actually, The definition that the first implementation of blockchain was Bitcoin is not the true one. Blockchain history dates back a little earlier.

3 decades earlier young programmers Scott Stornetta and Stuart Haber were working on the project 'How to Time-Stamp a Digital Document'. In this work, they described an outline that became the basis of contemporary blockchain building.

A Person is sending a post envelope on his own name with the purpose of confirming his authorship. Enclosed envelope with a post stamp where indicated sending date, is evidence of possible debates about document time of creation. In other words, that's a Block, put into a foundation of Blockchain idea.

Cryptographers outlined in chronological order built chain hashed data for authentication confirmation of timestamps on digital documents. To ensure from editing time-mark and the document was the main goal of their work.

Haber and Stornett's aim was to have the document «digital safe» sent the value of the cryptographic hash purpose, while the document remained with the sender. Part number 4. of the article obviously points out what today a chain of hashed blocks is:

1. The TSS sends our client the signed certificate  $s = \sigma(C_n)$ , where the certificate

$$C_n = (n, t_n, ID_n, y_n; L_n)$$

consists of the sequence number  $n$ , the time  $t_n$ , the client number  $ID_n$  and the hash value  $y_n$  from the request, and certain *linking information*, which comes from the previously issued certificate:  $L_n = (t_{n-1}, ID_{n-1}, y_{n-1}, H(L_{n-1}))$ .

2. When the next request has been processed, the TSS sends our client the identification number  $ID_{n+1}$  for that next request.

*Figure 1 Hashed blockchain described by Stornetta and Haber*

*Source : Free TON houe*

Nevertheless, any corrections in the file would lead to a discrepancy of hash identifier between the document and the repository in the hands. The researchers have to introduce a third party to prove or prevent the conspiracy between two parties.

In turn, to test her honesty, you have to introduce a fourth party. Then fifths party, indefinitely, until everybody in the world would be involved in the system. At this phase, Haber and Stornette might possibly yell: «Eureka!» because they had the idea of decentralizing the «digital safe» when the third party will become a lot of scattered witnesses. Their article also described a digital signature that would allow the signatory to be identified in the future.

Scientists suspected that their idea over the years has refined and expanded the range of proposed methods. Unfortunately, in that decade, there was no desire to introduce it. After that period there were lots of efforts to create a digital currency. (Stornetta, 1991)

### **3.2 First Digital Currencies.**

#### **Blinded Cash**

Somewhere in this time range, a cryptographer from America, David Chaum, tested a different type of electronic cash. His discovery of token currency that can transact between people was private and secure. He was the author of a "blinding formula" for data encoding among people. In this way, "blind money" can be securely transferred among persons who have the signatory and the possibility of modification without tracking. David became the creator of DigiCash. Nevertheless in 1998 DigiCash has collapsed, formulas put forward by the company as well as its concept of encoding instruments made a big impact on the future development of digital currencies. (Safronov, 2021)

## **Bit Gold**

The first owner of BitGold was Nick Szabo. Bit Gold was something that mirrored the contemporary mining process and proof of work system. Decisions were constructed cryptographically and then released to the public using this technique.

Bit Gold aimed to break free from reliance on centralized money distributors and governments. Szabo's fundamental notion was that Bit Gold would mimic the qualities of actual gold, allowing consumers to bypass the intermediary entirely. The Bit Gold concept, unfortunately, did not succeed. It did, however, serve as a model for numerous digital currencies that are no longer in use ten years or more after their first release.

## **Hashcash**

One of the most influential digital currencies that had been created in the mid-1990s was Hashcash. Hashcash was created for a range of reasons, covered reducing spam in the mail and avoiding DDoS attacks. To help produce and distribute new currencies, Hashcash uses a proof-of-work method. Furthermore, Hashcash has many of the same issues as today's modern cryptocurrencies; when demand for processing power surged in 1997, Hashcash became less and less efficient. Regardless of the fact that it finally came to an end, many aspects of the Hashcash technology have also influenced bitcoin's growth. (REIFF, 2021)

### **3.3 First working cryptocurrencies**

Although Stuart Haber and Scott Stornetta were 'pioneers' of the blockchain, the worldwide familiarity of the father of Bitcoin was awarded Satoshi Nakamoto. Satoshi Nakamoto, an individual or a group of individuals, published a white paper titled 'Bitcoin – A Peer to Peer Electronic Cash System' to address the centralized system of money and the trust necessary in managing citizens' cash. (Marr, 2017)

Transaction costs can add up and transactions can be reversed or meddled with by third parties, in the traditional financial system. Bitcoin was created as a way to conduct transactions without the use of a third party. Instead of depending on third-party banks and other organizations to keep the network secure, the Bitcoin system employs cryptographic evidence.

The blockchain was started on Jan. 3, 2009. This day, the first block, called the genesis block, was extracted. A week later, the first test transaction took conducted.

It was exclusively available to miners who validated the Bitcoin blockchain and investigated cryptocurrencies for the first few months of its existence.

Bitcoin was worthless at the time. People who traded Bitcoin for fun utilized powerful computers to tackle challenging math problems in order to locate fresh Bitcoins and verify that earlier transactions were valid.

The first economic transaction took a year to complete. On May 22, 2010, a man from Florida purchased two \$25 Papa John's pizzas and had them delivered for 10,000 BTC. The original real-world price or value of Bitcoin was set at 4 Bitcoins per penny as a result of that transaction. (Hicks, 2022)

### **3.4 Bitcoin Price History.**

Bitcoin is widely known for its volatility. As a new asset class, Bitcoin carries with it a lot of speculation, and the basis of its value is widely discussed. Despite price volatility, Bitcoin's price has exploded since its launch in 2009.

"Bitcoin's history is largely one of astronomical growth punctuated by a few severe price retrenchments"

Peter C. Earle (Kochkodin, 2021)

#### **2009–2015**

Bitcoin was a zero value when it was released in 2009. On July 17, 2010, it rose to \$0. The price of Bitcoin rose again on April 13, 2011, from \$1 to \$29.60 by June 7, 2011, increasing by 2.960% in three months. Cryptocurrency markets experienced a sharp decline, and by mid-November, Bitcoin's price had reached \$2.05. The following year, the price rose from \$4.85 on May 9 to \$13.50 by August 15th.

2012 was generally monotonous for Bitcoin, but in 2013 there was a significant rise in prices. Trading began at \$13.28 and reached \$230 on April 8; This was followed by an equally rapid decline, which a few weeks later, on July 4, fell to \$68.50.

In early October, Bitcoin was trading at \$123.00; By December, it had jumped to \$1,237.55 and dropped to \$687.02 three days later. Bitcoin prices fell by 2014 to \$315.21 by early 2015.

## **2016–2020**

Prices rose slowly in 2016 to \$900 at the end of the year. In 2017, the price of bitcoin hovered around \$1,000 until it crashed \$2,000 in mid-May, and then rose to \$19,345.49 in December. 15. Large investors, governments, economists, and academics have noticed, and others have started to develop cryptocurrencies to compete with Bitcoin.

Bitcoin prices declined over the next two years, with small activity. For example, in June 2019, prices and trading volumes were active, and prices exceeded \$10,000. However, it fell to \$6,635.84 by mid-December.

In 2020, the economy collapsed due to the COVID-19 pandemic - the price of bitcoin rose again. Cryptocurrency started the year at \$6,965.72 per bitcoin. The suspension of the pandemic and subsequent government policies have heightened investor concerns about the global economy and accelerated bitcoin growth. By the end of November 23, Bitcoin was trading for \$19,157.16. Bitcoin's price had reached just below \$29,000 in December 2020, rising to 416% since the beginning of this year. (EDWARDS, 2022)

## **Bitcoin Price today**

Today, one bitcoin costs about \$61,356 on November 1, 2022. It's a long way from its all-time high, but it's also a long way from its post-peak in 2018, just over \$3,000. As Coinbase, a cryptocurrency exchange, went public in mid-April, bitcoin value hit new highs of over \$60,000 for the first time. 13 Institutional interest lifted bitcoin's price further higher, and on April 12, 2021, it hit a high of approximately \$63,000.

Prices have dropped by half by the summer of 2021, to \$29,795.55 at their lowest point on July 19. Another \$52,693.32 rise, happened in September, but a significant reduction resulted in a drop of \$40,709.59 in the next two weeks.

Bitcoin hit a new all-time high of \$68,990.90 on the 10th of November 2021. Bitcoin plummeted to \$49,243.39 in early December 2021 before fluctuating further as investors were concerned about inflation and the emergence of a new COVID-19 variation, Omicron. (Hicks, 2022)

## **3.5 Blockchain conception**

Blockchain is the complete and unchanging transaction history of a decentralized community that all members of the community agree with. The register is automatically updated in the normal time frame, accepted as fact by the community, and stored on the computer of each



participant. Thus, no central side should be controlled by the community, as no one can incur double costs. This will create an immediate conflict in the transaction history of each member.

There is no central party that dictates that «really», the community does this decentralized. Thus, blockchain technology allows storing any «reality» without having to control it. It can be applied to any type of ownership, identification, knowledge, or currency. (Hops, 2013)

### **3.6 The structure of Blockchain technology.**

Due to the fact that Blockchain is a global digital ledger, where all transactions form a Blockchain network - blocks form a linear sequence and they are added to the chain at regular intervals. In turn, each block has some fields with information that is very dependent on the Blockchain network.

The reason why the Blockchain is not hackable is that Each block contains the cryptographic hash of the previous block. The hash does not contain any information which anybody would change. All hash information creates automatically. The ‘Merkle Root’ includes all previous transactions and their hash values. Timestamp which contains the time block of creation is Another important moment for the reliability of the Blockchain.

Blockchain transparency is achieved by the registration of each transaction – it allows viewing the information of transaction at any time and it is public for all users of these chains. The transactions include the messages with the information to Externally Owned Accounts (EOAs) or contract accounts. These messages include the sender’s and recipient’s address, the value for transfer, and the input data for the recipient contract and those sent also by EOAs.

The private key and the account password are necessary for sending transactions to other accounts. In turn, the file JSON of the public-private key is established when the new EOA is created. The message is produced by the contract, but the transaction is produced by the EOA.

When the new block gets to the blockchain, it checks the block time of the generation, which was indicated by the node. This time includes the time on the check, on the generation, and on the wait at the level. The next block with all accumulated transactions is created through 120 seconds after the time when the last block was signed by the miner on the 0 level. (Hops, 2013)

### **3.6.1 Public blockchains**

In a public blockchain, a user can become a member of a blockchain network. After downloading necessary software on their device they can store, send and receive data. Data stored on the blockchain can be read and written by anyone in the world.

A public blockchain is completely decentralized. All connected users, who come to a consensus before any data is stored on the database, have permissions to read and write data onto the blockchain are shared equally by

The most popular digital currency that permits users to use a platform for making transactions directly between them is Bitcoin, public blockchain.

### **3.6.2 Private blockchains**

Permission to write, send and receive data is controlled by one organization in a private blockchain. Only a few users of the organization are permitted to access and carry out transactions in private blockchains.

The organizations in control have a possibility to decline transactions based on their established rules and regulations to change the rules of a private blockchain.

### **3.6.3 Consortium blockchains**

A hybrid model between the low-trust offered by public blockchains and the single highly-trusted entity model of private blockchains can also be called a consortium blockchain or permission blockchain. In a consortium blockchain, a few selected parties are predetermined instead of allowing any user to participate in the verification of the transaction process on the other side, just allowing one single company to have full control. It only allows a limited number of users the permission to participate in the consensus process.

For instance, a group or network of ten banks, each of which is connected to the blockchain network. In this example, we could imagine that for a block to be valid, seven of the ten banks have to agree. (FRANKENFIELD, 2021)

## **3.7 Cryptocurrency**

### **3.7.1 Cryptocurrency conception.**

Cryptocurrencies are virtual or digital currencies that use cryptography technologies to sustain them. Their mission is to ensure the security of internet payments without the need for third-party middlemen. Different encryption algorithms and cryptographic techniques that

safeguard entries are referred to , "Crypto". Public-private key pairs, elliptical curve encryption, and hashing methods are among the options.

There is a possibility of purchasing cryptocurrency from cryptocurrency exchanges or mining it. There are now a few e-commerce sites that accept cryptocurrencies as payment.

Cryptocurrencies, even the most well-known ones like Bitcoin, are, nonetheless, rarely utilized for retail transactions. Eventually, cryptocurrencies become widely known as a trading tool because of rising their value. Because of their restricted range, they are also employed for cross-border transfers. (Scott, 2020)

### **3.7.2 Types of Cryptocurrencies**

According to Yahoo finance 0.12% are held by all insiders, 59.06% held by institutional holders, number of institutions holding share is 5 018. Besides, not only institutional holders are owing the part of company.

As of the 13th of December of 2020, there are more than 15,000 cryptocurrencies, according to tocoinmarketcap.com, and more are getting added every day, though it remains to be seen how many are left finally.

“Cryptocurrencies can be classified into different categories, like Defi, NFT, utility tokens, store of value tokens like bitcoin and Litecoin, and yield farming tokens like Aave.

According to cryptocurrency's utility, we can categorize them into four types.

#### **Currency**

Bitcoin, the world's first cryptocurrency, has made for this utility. The main goal was to create cross-border payment transactions cheaper and faster. Over the years, it has proved to be a store of value.

Crypto(s) can be used in any public decentralized chain of blocks. This is similar to the Ethereum blockchain token, in which the Ether is a token. Solana Blockchain uses Sol as its token. Thus, tokens have allowed developers and the public to use this particular blockchain using its own tokens.

#### **Asset**

Cryptocurrencies such as Stablecoins can be categorized as assets as the value of these cryptocurrencies is derived from the value of an external asset. For example, the USDT value is based on the US dollar. Gold GLC is repeating the value of gold.

Before stablecoins appeared on market, if investors decided to exit any cryptocurrency, they could exchange it for any other cryptocurrency (which may or may not be preferable) or fiat

currency. Now because of the presence of stablecoins, they are able to stay in the cryptographic ecosystem by exchanging their cryptocurrency for stable crypto.

To settle a transaction Commodities could also be used. This cryptocurrency includes hybrid features of the commodity as well as currency. It is normal to consider them as a commodity because they do not impact the economy of the country. (Devries, 2016)

### **Object**

These cryptocurrencies are aimed at solving the problems of the world. For example, Siacoin (SIA) aims to solve the problem of expensive cloud storage. As mentioned on their official website, "Sia is the leading decentralized cloud storage platform. Sia leverages blockchain technology to create a data storage marketplace that is more robust and more affordable than traditional cloud storage providers. No signups, no servers, no trusted third parties."

Another example is Decentraland, which is an Ethereum-based application where users can buy virtual land (NFT-based) using its cryptocurrency (MANA). Similarly, there are many more crypto coins that provide this type of utility.

### **Meme or Joke Coin**

These coins were created strictly for fun, with no specific goal or purpose. For example, Dogelon Mars (ELON) was created as a joke. It is supposed to facilitate "InterPlanetary Money Transactions" when it becomes viable. Its market capitalization is over \$500 million as of December 13, according to coinmarketcap.com.

Meme coins are very speculative assets that work on the simple idea of community-based pumped-up trading. Most of them have no use case they can go bust, which means their value becomes zero at any time.

Various cryptocurrencies claim to have various features and specs. Ripple's XRP, for example, is used by banks to enable cross-border transactions. Ethereum marks itself as gas for the smart contract platform.

Following Bitcoin's rise, plenty of other cryptocurrencies known as "altcoins" have emerged. Some are Bitcoin clones, while others are brand new currencies created from the ground up. Litecoin, Ethereum, Cardano, Solana, and EOS are among them. By November 2021, the value of all the cryptocurrencies had reached over \$2.1 trillion. Furthermore, Bitcoin represented approximately 41% of that total value. (FRANKENFIELD, 2021)

### **3.7.3 Cryptocurrency and Tokens**

Cryptocurrencies can be divided into two main groups: those that have their own blockchain, and those that use a blockchain created by another project.

Cryptocurrencies that have their own blockchain are Bitcoin, Ethereum, Litecoin, XRP, EOS, Tezos, Cardano, etc. The units of those cryptocurrencies are commonly referred to as coins. But there are lots of cryptocurrencies that do not have their own blockchain. However, they have a market capitalization of over \$1 billion. For example, USDT, LINK, USDC, UNI, WBTC, AAVE, etc. They are properly referred to as tokens. (Myfin.bu, 2021)

### **3.8 How to Invest in Cryptocurrencies**

Today there are lots of possibilities for investing in Cryptocurrencies. There are many platforms of crypto trading such as Coinbase, Voyager, BlockFi, Uphold, Kraken, Binance, Crypto.com where you can buy cryptocurrencies straight.

Every day we can see how new different projects on the blockchain are appearing on the web. Most of them are interested in the attraction of the investments. On this base, these companies hold different offerings where everyone has an opportunity to win the possibility to buy this crypto on the initial price.

### **3.9 IPO, ICO, IEO, IDO, and STO**

#### **IPO (Initial Public Offering)**

The process through which a private firm can become public by selling its stock to the general public is known as an initial public offering (IPO).

#### **2. ICO (Initial Coin Offering)**

In the crypto industry, an ICO is often used to launch a new service or product, such as a new cryptocurrency token or an app. In reality, it's quite similar to an IPO (Initial Public Offering), which a new business uses to obtain capital when it first enters the stock market.

#### **3. IEO (INITIAL EXCHANGE OFFERING)**

Companies sell their tokens directly to individual participants in an IEO rather than offering them in an ICO.

#### **4. IDO (INITIAL DEX OFFERING)**

IEO has a subtype called IDO. The most significant distinction between IEO and IDO is that IDO is carried out on a decentralized exchange.

#### **5. STO (SECURITY TOKEN OFFERING)**

In comparison to an ICO, a Security Token Offering is a more sophisticated and challenging fundraising mechanism.

### **3.10 Advantages of Using ICO**

#### **1. The possibility to buy tokens for everybody**

**Token** sales are not the same as stock sales in a large-scale initial public offering (IPO). The Securities Exchange Act of 1934 imposes strict standards on Initial Public Offering. The selling of digital keys might be compared to a token launch.

#### **2. Less Barrier to Entry**

Companies come to Silicon Valley for numerous technology-related IPOs. Wall Street is "the place to be" for comparing financial offerings. However, because token launches can take place anywhere in the globe, this need is no longer necessary.

### **3.11 Tokens Can Be Sold Globally**

An initial coin offering (ICO) allows worldwide investors to invest in new currency. In many situations, digital money transacts into project coin offers are a worldwide undertaking. If an IPO account got hundreds of wire transfers in a matter of minutes, the assets would most likely be frozen in the bank account. Token sales paid for using digital cryptocurrency, on the other hand, are always open for business. (Hops, 2013)

### **3.12 Mining**

The method of earning bitcoins in return for conducting the verification procedure that validates Bitcoin transactions are known as bitcoin mining. These transactions ensure the Bitcoin network's security, and miners are rewarded with bitcoins as a result. If the value of bitcoins rises above the cost of mining them, miners will benefit. The incentives and environment for mining have shifted as a result of recent improvements in mining equipment and technology, as well as the development of professional mining farms with massive processing capacity, as well as the altering price of bitcoin itself. Many independent miners are now wondering if Bitcoin mining is still lucrative.

Mining is possible only for coins that work on the Blockchain consensus Proof of work. Most coins are now moving to other types of consensus. Accordingly, it will be impossible to extract these coins using powerful computing machines.

With each coin recovered, its formula and extraction become more complicated, which means

the extraction time increases.

To date, more than 50% of cryptocurrency mining is owned by large crypto miners. Which increases the difficulty of crypto mining by 30-40% annually. This means that the profits from cryptocurrency mining will be broken every 2-3 years.

In addition to the cost of the equipment itself, the extraction of the crypt consumes a huge amount of electricity. For example, to extract one bitcoin, a miner must feed his machines 150,000 kWh of energy which is enough to power 170 ordinary American homes for a month, which in turn is a very expensive and environmentally unfriendly occupation in European conditions.

### **3.13 Staking**

With the introduction of the "Proof of Stake" blockchain consensus, it is now legal to receive dividends by staking bitcoin. Crypto staking is a new approach to earning passive income with cryptocurrencies.

What the Crypto Staking is?

Making an analogy can be said that cryptocurrency stacking is similar to putting your cash in a savings bank account and earning interest on it.

When you put money in the bank, the bank uses that money for its other businesses. When the term comes to an end, the bank pays you interest.

Crypto Staking also includes making your cryptocurrency with some trusted protocols. They collect cryptocurrency from investors without buying it.

To get more crypto in result they use cryptography to increase the blockchain. Consequently, These rewards are then distributed between those who staked their cryptos.

This means that your idle cryptocurrency is now being used in an attempt to contribute towards blockchain development.

Similar to what banks do, to generate more money they use your savings to make certain investments. (Hops, 2013)

#### **3.13.1 What proof of stake is?**

In crypto, proof of stake is a consensus technique that allows blockchain to validate transactions. In a blockchain, nodes must agree on the current state of the blockchain and which transactions are genuine.

Cryptocurrencies employ a variety of consensus processes. Due to the fact that participants may receive incentives from the crypto they stake, proof of stake is one of the most effective. Staking payouts are a type of incentive that blockchains provide to their users. Each blockchain has a particular number of nodes of cryptographic rewards to verify the transaction block. When you stake cryptocurrency, and you are selected to verify transactions, you get these rewards.

### **3.13.2 Advantages of staking crypto**

There are the benefits cryptocurrency staking benefits:

- Earning interest in bitcoin assets is simple.
- Unlike mining cryptocurrencies, crypto staking does not require any special equipment.
- You're helping to support the security and efficiency of the blockchain.
- It's more ecologically friendly than crypto mining.

### **3.13.3 Staking crypto risks**

There are a few disadvantages to staking cryptocurrency:

- Cryptocurrency values are variable and can drop suddenly. If the value of your staked assets plummets, whatever interest you receive on them may be wiped out.
- Staking requires coins to be locked for a set period of time. There is no way to sell or transfer them at that time.
- Unstaking period can be 7 days or longer (Hops, 2013)

## **3.14 Bull market and Bear market**

Investing world, involves the terms "bull" and "bear". They're regularly employed to describe the state of the market. These concepts define the general performance of stock markets, such as whether they are rising or falling in value.

A bull market is one in which prices are rising and economic circumstances are typically favorable. A bear market occurs when the economy is stagnating and most equities are losing value. Since the financial markets are heavily impacted by investor attitudes, these phrases also refer to how investors react on the market and the resulting economic developments.

A continuous increase in prices characterizes a bull market. A bull market in equities markets refers to an increase in the price of a company's stock or a rise in the price of a cryptocurrency.



A bear market, on the other hand, is one that is in decline. A market is not regarded as a real "bear" market unless it has plummeted 20% or more from recent highs. In a bear market, stock prices are consistently decreasing. This causes investors to assume that the negative trend will continue, which maintains the downward cycle. Throughout a bear market, the economy gradually decreases, and unemployment grows as businesses lay off workers. In the case of cryptocurrencies, the price will continue to fall. (Anon., 2021)

## **4 Practical Part**

### **4.1 Fundamental Analysis**

Fundamental analysis is a method of evaluating of the internal value of an asset or business. To correctly determine those values, the internal and external factors should be qualitatively examined. Those values will help to determine whether the asset or business under consideration is overestimated or undervalued.

Basically, Fundamental Analysis can be divided into 3 parts. There On Chain Metrics, Project Metrics and Financial metrics. Each of them is necessary and provides useful information about cryptocurrency.

To correctly understand fundamental analysis and formulate the best strategy we would review specific indicators.

#### **4.1.1 On-Chain Metrics**

##### **Transaction Count**

The transaction count is a good measure of the activity that occurs on the network. By applying a number over a given period (or using moving averages), we can see how the activity changes over time.

##### **Transaction Value**

The value of the transaction shows us how much value was a transaction during the period. It could be measured in a fiat currency like USD, or in the protocol's native unit, for example Ethereum.

##### **Transaction Volume**

Volume refers to the total number of real deals, whereas liquidity refers to the quantity of money available for trading at any given price. The more, for example, bitcoin transactions there are, the more liquid the crypto market becomes.

##### **Active Addresses**

Active addresses are the blockchain addresses that are active in a given period. The approaches to calculating it vary, but the popular method is to count both sender and recipient of each transaction over fixed periods (e.g., days, weeks, or months).

##### **Fees Paid**

Perhaps more important for some crypto assets than for others is that the fees paid can tell us about the demand for the block space. We could think of them as auction bids: users compete

with each other for timely inclusion of their transactions. Those offering higher rates will see their transactions confirmed (extracted) earlier, while those offering lower rates will have to wait longer.

For cryptocurrencies with shrinking emission curves, this is an interesting metric to study.

The main Proof of Work (PoW) blockchains reward the block. In some cases, it consists of block subsidies and transaction fees. Block subsidy is periodically reduced (in events such as Bitcoin halving).

### **Hash Rate and Amount of Staked**

These days, blockchains implement many different consensus algorithms, each with its own mechanics. They play such an integral role in ensuring the safety of the network, the study of the data surrounding them may be useful for fundamental analysis.

Hash rate is often used as a network health measure in Proof of Work cryptocurrencies. High hash rate makes very difficult to successfully execute the mount 51% attack. But increases over time may also indicate a growing interest in mining, probably as a result of cheap overheads and higher profits. Conversely, the reduced hashing rate indicates that miners are going offline (the miners' capitulation»), as they no longer benefit from protecting the network.

Staking (for example, in Proof of Stake) is another concept associated with game theory similar to PoW mining. Regarding to mechanisms, this works in another way. The basic idea is that users put their own assets to participate in the verification of the block. In this way, we could look at the amount set at a given point in time to assess the interest (or lack thereof).

### **4.1.2 Project Metrics**

#### **Whitepaper**

Famoust method of determining the value of cryptocurrencies and tokens includes classical project analysis methods. By studying the whitepaper, you will understand the objectives of the project, its use and technology. A list of team members' achievements gives an idea of their ability to create and scale a product. Finally, when you look at the road map, you will see if the project is on track. These methods may be supplemented by an analysis to determine whether the project is able to achieve its objectives.

The White Paper on Cryptography is a technical document that describes the purpose and work of the project. This is the most important project document and should contain at least

the following information:

- Solutions of Blockchain Technology
- Cases of use for the currency
- Features and upgrades
- Sales Information and Tokens economics
- Information about team of the project

### **4.1.3 Financial Metrics**

#### **NVT (Network value to transaction)**

The equivalent of the coefficient P/E is the coefficient NVT - basic indicator of Fundamental Analysis in cryptocurrencies. The author of this formula is Willy Woo – New Zealand technologist, investor, cryptocurrency advocate. The formula of this coefficient is:

Network value / The daily transaction volume

If the result is higher than 90-95, we can say that network is overvalued compared to the low ability to transact coins in terms of volume, implying the possible liquidation of the approaching price bubble. This interpretation is based on the effect of reversion to the mean.

#### **MVRV (Market value to Realized value)**

This indicator helps to determine whether the price is fair or not, which means that it is useful for obtaining market peaks and bases. David Puell is author of this formula:

Market Capitalization / Realized Market Capitalization

If the growth of market capitalization exceeds the growth of realized capitalization, MVRV values increase, indicating a possible motive for the sale.

Growing trend: increasing pressure from sellers

As MVRV increases, this indicates that market capitalization is ahead of realized capitalization, which means an increase in the motive for selling to the market.

Downward trend: reduced pressure from vendors

As MVRV decreases, this indicates that the capitalization realized exceeds the market capitalization, which means that the motive for selling in the market is reduced. (Anon., 2021)

### **Stock To Flow Indicator**

The Stock-to-Flow indicator is a famous cryptocurrency price indicator, usually with a limited supply. The model treats each cryptocurrency as a fixed scarce resource, similar to precious metals or stones. Since there is a known limited supply without new sources, investors are using these assets as savings.

Formula:

Circulating supply of Cryptocurrency / Number of Coins produced per year

Cryptocurrency is limited resource and attracts investors by its limitation. The more time it takes to produce the same number of coins on the market at the moment, the less cryptocurrency I'm exposed to inflation. (Binance, 2020)

## **4.2 Technical Analysis**

Based on graphs and historical price indications, technical analysis gives basic indicators and metrics to determine market patterns.

All algorithms can be divided into 4 types:

**Trend.** Indicate the main direction of quotation change.

**Oscillators.** Help to look for moments of overbought and oversold. In such a situation, the probability of correction or change of trend is high.

**Based on moving averages.** The network also has the name Moving Average (or MA).

**Volume.** It is not the rate of the asset that is analyzed, but the volatility (rate of price change).

Among the many indicators of technical analysis, (SMA) is the most frequently used and known examples.

### **Simple Moving Average**

The SMA is derived using the closing price of an asset over a given time period.

### **Exponential Moving Average**

The Exponential Moving Average (EMA) is a modified form of the Simple Moving Average (SMA) that considers the most recent prices of concluded transactions rather than older ones.

### **Relative Strength Index**

The relative strength index (RSI), which belongs to the oscillator family of indicators, is the second most used indicator. Oscillators, unlike simple moving averages, use mathematical algorithms to price data and then create readings that fall inside specified ranges. This range, in the case of RSI, is from 0 to 100. (FERNANDO, 2022)

### **Moving Average Divergence Indicator**

The primary line of the MACD is created by subtracting two EMAS (MACD line). After then, the first line is utilized to construct another EMA, yielding a second line (also known as a signal line). A MACD histogram is also included, which is computed using the discrepancies between the two lines. (Binance, 2020) (Anon., 2021)

## 4.3 Fundamental Analysis of Ethereum

### 4.3.1 On-Chain Metrics

#### Transaction Count

According to chart given lower, there is large increase in Transactions number in period of June 2019 and June 2021. The number of transactions increased from 685.96 thousands in June 2019 to 1,351.55 thousands in June 2021. This data provides information that Ethereum coin is actively trading, and the interest of investors doesn't fall through time.

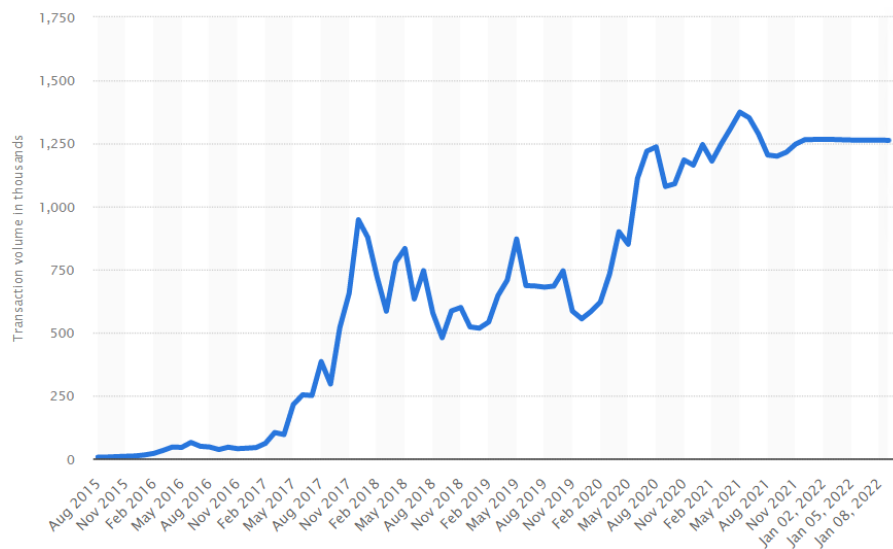


Figure 2 Transaction Volume in Thousands of Ethereum

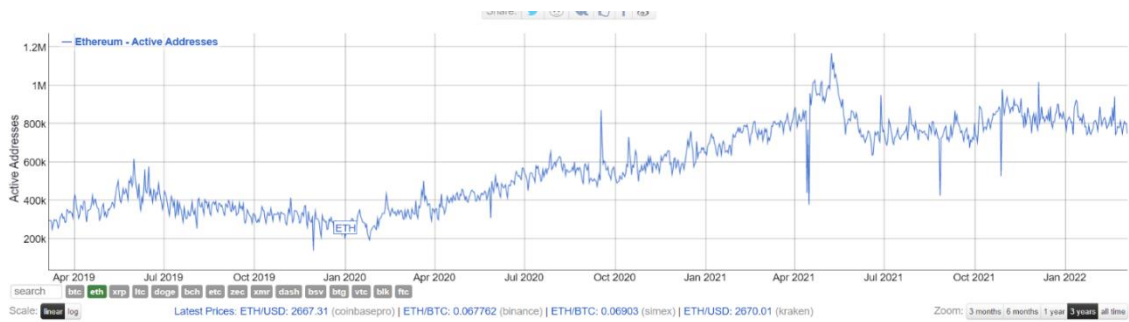
Source: Statista

Number of transactions in the last 24 hours on 03.05.2022 was 1,081,526 on average transaction value of 1,05 Ethereum. Calculation of Transaction Volume for last 24 hours gave an amount of 3 029 172 910.92 of USD. This is the amount on which the Ethereum was traded.

$$\text{Trans Volume (24H)} = 1\,135\,602,3 \text{ ETH} * 2667.46 = 3\,029\,172\,910.92$$

#### Active addresses

Number of Active Addresses from June 2019 to June 2021 also increased. From 488,360 thousands to 863,470 thousands. Number of successful sent or received transfers increased 2 times. This project still attracting new investors and more users utilizing blockchain.



*Figure 3 Number of Active Addresses of Ethereum*

*Source: BitinFocharts*

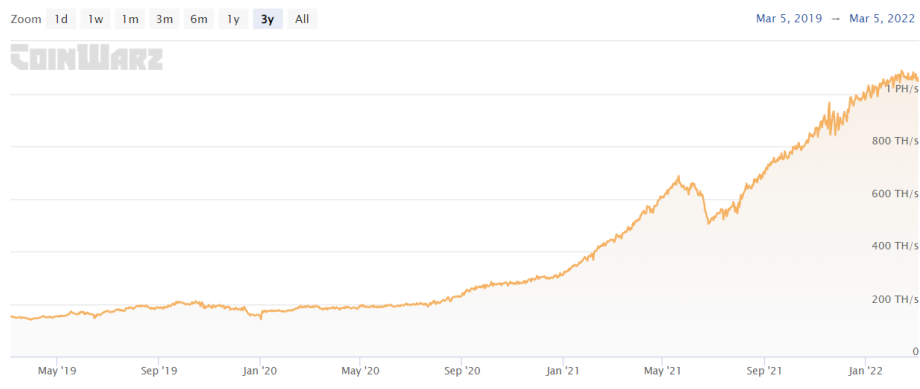
## Transaction Fees

Average Transaction fee is 0,004 ETH. The whole amount of fee on 03.05.2022 is 4326,104 Ethereum or 11 539 709.4.

## Hash Rate

At block height 14,329,615 with a difficulty of 12,812,684,329,804,880.00, the current Ethereum hash rate (ETH hash rate) is 1.07 PH/s.

That's quite high value of hash rate and indicates that Ethereum network is healthy and its difficult to mount 51 % attack.



*Figure 4 Hash Rate of Ethereum*

*Source: Coin Warz*



## **Staking**

Ethereum also have possibility of staking.

By 30th of June 2021 Ethereum launchpad had 5.91 million in ETH being staked. The amount equates to nearly 180,000 validators on the network.

### **4.3.2 Financial Metrics**

The total number of Ethereum coins on 03.05.2022 is 117,765,776. Market Capitalization on 03.05.2022 is 314 135 496 848.96 \$

Market capitalization = Circulating supply \* Price

$117,765,776 * 2667.46 = 314\ 135\ 496\ 848.96\ \$$ .

## **NVT**

The NVT coefficient also more than 95 means that network is overvalued compared to the low ability to transact coins in terms of volume, implying the possible appearance of the price bubble coming. Expected a decreasing of Ethereum price in a short-term period what can be described as signal to sell.

## **MVRV**

On 03.05.2022 the coefficient of MVRV of Ethereum is 12,729 it is more than 3,7 and means that coin overvalued.

**NVT(ETH)** (Network value / Daily transaction volume)

$314\ 135\ 496\ 848.96 / 3\ 029\ 172\ 910.92 = 103,7$

**MVRV(ETH)** (Market value/ Realized value)

$314\ 135\ 496\ 848.96 / 24\ 677\ 222\ 999.48 = 12,729$

## **Stock to Flow model**

Stock To Flow model of Ethereum indicates on how much time needed to produce the same number of tokens as it is existing on market. The production power of Ethereum can produce this amount in 6,5425 years. That's a good coefficient among cryptos.

Circulating supply/ amount produced per year

117,765,776 / 18,000,000 = 6.5425

### **4.3.3 Project Metrics**

Team

Main creator and technician of Ethereum is Vitalik Buterin. Before appearing ETH on market, he was working with other, blockchain projects with open-source code.

Ethereum was co-founded by

Mihai Alisie – vice Strategic Manager

Anthony Di Lorio - vice the wallet and crypto services provider

Charles Hoskinson – vice Software Developer

Gavin Wood – computer scientist

### **Technology**

Ethereum does this by building what is essentially the ultimate abstract foundational layer: a blockchain with a built-in Turing-complete programming language, allowing anyone to write smart contracts and decentralized applications where they can create their own arbitrary rules for transaction formats, state transition functions and ownership.

### **Aim**

The goal of Ethereum is to create an alternative protocol for developing decentralized applications, with a different set of trade-offs that we assume will be very helpful for a wide range of decentralized applications, with a focus on situations where fast growth time, security for small and infrequently used applications, and the ability of various application to interact very efficiently are critical.

### **Roadmap**

The whitepaper of Ethereum also includes roadmap and tasks that Ethereum implementing to make possible to find in GitHub of the company.

Future

Ethereum 2.0 was announced by the Vitalik Buterin. Proof-of-stake will be introduced to Ethereum using the Beacon Chain. This is a novel method for you to contribute to the security of Ethereum. Consider it a public benefit that will improve Ethereum's health while also earning you more ETH. Staking ETH to activate validator software will be required.

You'll process transactions and add new blocks to the chain as a validator.

Mining is more difficult than staking and becoming a validator (how the network is currently secured). And it's hoped that in the long term, this would make Ethereum more secure. The more people that join the system, the more decentralized it becomes and the less vulnerable it is to attack.

## 4.4 Technical Analysis of Ethereum

### MA indicator

This work will be with a period of 100 days, as this parameter MA applies in the case of long-term trading. With this indicator, trend will be determined at first. In this graph, MA is presented as a black bold line, the price chart is presented as red and green candles. When the price is above the moving average line, it indicates an upward trend. If the price is below the moving average, it indicates a downward trend.



*Figure 5 MA indicator chart for Ethereum*

*Created by the author on TradingView*

On the graph, we see that since 2022 the price chart is below the moving average, which means that there is a drop in the price of Ethereum. On the chart of prices due to volatility it is difficult to determine the direction of the trend, but thanks to the moving average trend become evident. In a downtrend period, the moving average becomes the resistance line for

the price. The resistance line is the upper barrier that is unlikely to be overcome by price. If the price graph crosses the moving average line, this usually implies a trend reversal. At the moment, the price chart did not cross the moving average line, so the downward trend continues.

### RSI indicator

RSI indicator will be applied with a period of 14 days, which is the most recognized in the world. On this graph, the RSI indicator is a purple line bounded by two levels: the lower 30% and the upper 70%. If the signal line approaches the top, then the market is overbought, and if the signal line approaches the bottom, the market is oversold. If the indicator value is above 70%, that is, the probability of a price decline, and when the indicator value is below 30%, the price is expected to rise.



*Figure 6 RSI indicator chart for Ethereum*

*Created by the author on TradingView*

According to Ethereum's graph of 20 January 2022, the signal line went beyond 30%, indicating a further rise in the price and signaling a purchase. There can be observed that after the return of the signal line to the range, there was no significant overbuy in the market, that is, no signals to sell. At the moment, the indicator does not give clear signals to buy or sell, as the signal line of the indicator does not cross any of the levels.

## MACD indicator

The MACD indicator is represented as two moving average, zero line and histograms. The indicator was originally invented for exponential moving averages - EMA, but in order to use this indicator on wider time intervals, the EMA will be replaced with SMA. The blue line on the graph is the MACD line, the orange line is the signal line that is needed to further smooth out the values of the MACD line and get fewer false signals. The histogram is used to visually simplify the interaction of the signal line with the MACD line. The more the MACD line moves up from the signal line, the higher will be the bars of the histogram. The smaller the distance between the MACD line and the signal line, the smaller are the columns of the histogram.



Figure 7 MACD indicator chart for Ethereum

*Created by the author on TradingView*

Consider the intersections of the MACD line. On February 18, 2022, the MACD line crossed the signal line and was underneath it, in which case the histogram was below zero and red accordingly. This implies a drop in price. On 22 February 2022, the MACD line crossed the zero line from top to bottom, which once again proved the fall in price. But on March 4,

2022, the MACD line crossed the signal line from the bottom up, and we saw a histogram above zero, indicating a further slight increase. And on March 13, 2022, the MACD line crossed the signal line from top to bottom. To summarize, that a small drop in the price of Ethereum is expected in the near future. The asset should be bought when each column of the red histogram becomes shorter than the previous one. This will be a signal for the further growth of the crypto asset, but the growth may be small since found out earlier with the help of the MA indicator that the market is currently moving in a downward trend.

## 4.5 Fundamental Analysis of Doge Coin

### 4.5.1 On-Chain Metrics

#### Transaction count

Number of Monthly transactions from June 2019 to June 2021 almost still remain the same. 28.17 thousands on the beginning of the period and 23.92 at the end. On the graph we can see jumps of transactions number mostly caused by news buzzes and statements of famous people in media about this coin. In a long distance there is no significant growth of this coin.

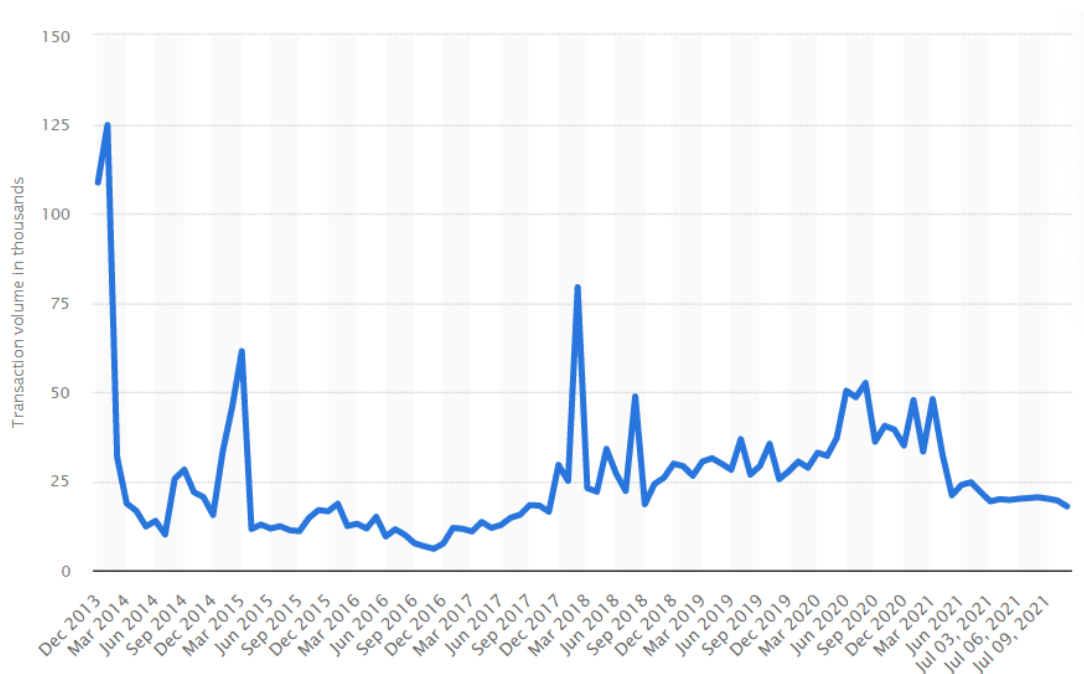


Figure 8 Number of Transactions in thousands of Doge Coin

Source: Statista

On 03.05.2022 there were made 23,280 transactions by average Transaction value of 79,552

Doge. That means the transaction value is 1851970,56 for the last 24 hours. Transaction Volume is 222 236 467 \$ in last 24 hours.

### Number of Active Addresses

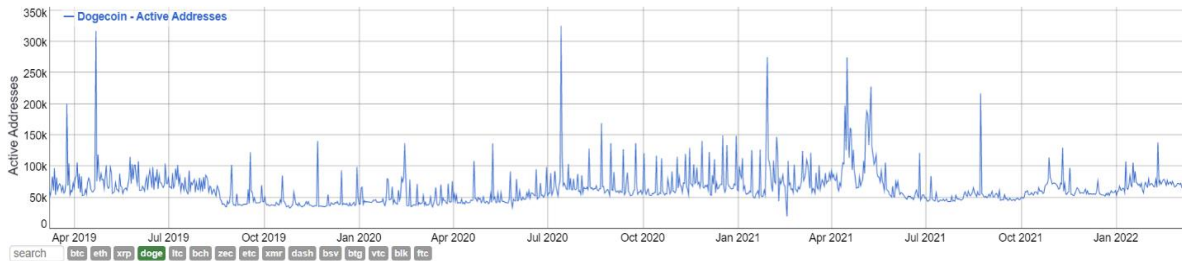


Figure 9 Number of Active Addresses of Doge Coin

Source: BitinFocharts

As a situation with number of transactions, the situation with number of active addresses is still remain. The number of Active Addresses has changed from 79,93 thousands in June 2019 to 51,296 in June 2021.

### Transaction Fees

The average transaction fee of Dogecoin per transaction is 1,32 doge.

Av. Fee value - 1,32 Doge.

Av. Fee value (last 24h) – 30.657

### Hash Rate

The current Dogecoin hash rate is 338.79 TH/s, representing the global Dogecoin network hash rate with a mining difficulty of 4.97 M at block height 4,132,751.



*Figure 10 Hash Rate of Dogecoin*

*Source: CoinWarz*

## **Staking**

No possibility of stacking.

### **4.5.2 Financial Metrics**

Market Capitalization of Doge coin is 15,931,200,000 \$. Circulating supply is 132 760 000 tokens.

Market capitalization = Circulating supply \* Price

Market capitalization = 132 760 000 \* 0.12 = 15,931,200,000 \$.

## **NVT**

### **MVRV**

The NVT coefficient of Doge coin is equal to 71685.80. That's an exorbitant number says to us that Doge coin is extremely overvalued. Something similar happening with coefficient MVRV that also indicates on overvaluation of this market.

NVT(Doge) (Network value / Daily transaction volume)

$15,931,200,000 / 222\,236,47 = 71\,685,80$

MVRV(Doge) (Market value/ Realized value)

$15\,931\,200\,000 / 23\,150\,000 = 688,1727862$

### **Stock – To – Flow Model**

Stock to Flow coefficient (Circulating supply/ amount produced per year)

$132\,760\,000\,000 / 5\,000\,000\,000 = 26,552$

Stock to flow coefficient, indicates that more than 26,5 years needed to produce the same number of tokens as in circulation on market right now.

### **4.5.3 Project metrics**

Whitepaper

Unfortunately, the official website of Dogecoin does not include any whitepaper, there is



only a short brief video ‘what is dogecoin’. There is no roadmap or supply and distribution scheme for tokens. This project doesn’t present any ‘new’ technology. As it said in the video, this is just a cryptocurrency you can pay anywhere. Also, there is almost nothing about team. At the bottom of the website, we can see that this coin was created by Jackson\_Palmer & Shibtoshi\_Nakamoto but there is no information about those people. From the internet, we can find that creator of this coin is TESLA in the head of Ilon Mask.

## 4.6 Technical Analysis of Doge coin

### MA indicator

In this case, a 100-day MA will be taken. Moving average works perfectly for long periods of time. On the Dogecoin chart, the middle line is black, and the price chart consists of green and red candles. There will be trend determination. On the graph, we see that on November 15, 2021, the price chart crossed the moving average line, which indicates that the trend changed on that day. Since November 15, 2021, the price chart is below the moving average line, there can be concluded that the trend is downward, and since November 15, 2021, the trend from the upward to the downward trend and continues now. The moving average for the last period of time did not show signals of a further trend reversal.



Figure 11 MA indicator chart for Dogecoin

Created by the author on TradingView

## RSI indicator

On the Dogecoin graph, the purple line is an RSI indicator. The signal line is limited to two levels: the upper 70% overbought zone and the lower 30% oversold zone. The time period for the indicator is 14 days.



Figure 12 RSI indicator chart for Dogecoin

Created by the author on TradingView

Looking at the graph we see that on January 10, 2022, the line of the indicator last went beyond the range and showed a clear signal to action. In this case, it was the signal to buy, as the line dropped below 30%. Early with the help of MA indicator were determined that from November 15, 2021, the price of Dogecoin is in a downward trend. If the RSI indicator reaches 60% in the downward trend, it becomes a sales signal. So, on February 7, 2022, the signal line of the indicator reached the mark of 60% and gave a signal to sell the asset. The price then fell as expected, moving closer to the oversold zone, where it is now.

## MACD indicator

Consider the MACD indicator, which is located under the main price chart. On the graph of the indicator, we see two moving averages, would be replacement of the default EMA with SMA in order to work for long periods of time. The blue line is the MACD line, the orange line is the signal line, which helps to get more true signals, by smoothing the values of the MACD line. Also, on the indicator MACD, there is a line passing through 0 which is the so-called equator.



Figure 13 MACD indicator chart for Dogecoin

Created by the author on TradingView

On the chart, there are histograms that are painted green and red. The histogram above zero and green indicates the strength of buyers (bulls), and the histogram below zero and red indicates the strength of sellers (bears). Since the beginning of 2022 on the graph of the indicator, we observe an area of uncertainty, that is, green and red histograms of about the same size. Since the histograms in the additions are small sizes, it indicates weakness of both bulls and bears, that is, most likely in recent time investors have not been interested in Dogecoin. On 13 March 2022, the MACD line crossed the signal line from top to bottom,

indicating a further slight drop in price.

## 4.7 Fundamental analysis of Chain-Link

### 4.7.1 On-Chain metrics

#### Transactions Count

According to glassnode.com, number of monthly transactions of Chain Link coin is raised from 1804 of transactions to 13 596 in a period of June 2019 to June 2021.

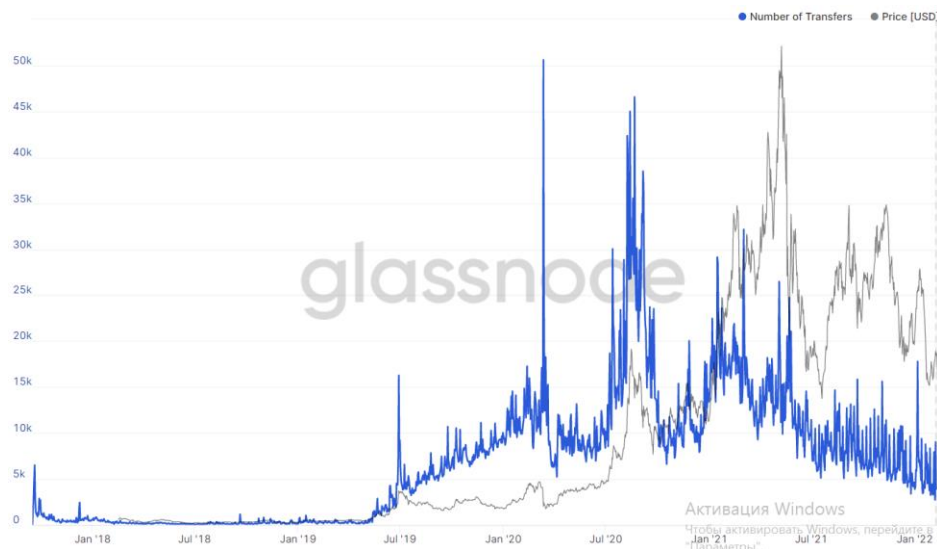


Figure 14 Number of Transactions of Chain-Link

Source: Glassnode studio

Number of transactions in the last 24 hours on 03.05.2022 was 8788. Transaction Volume for last 24 hours gave an amount of 10 771 925.4554 of USD.

#### Active addresses

Number of Active Addresses from June 2019 to June 2021 increased. From 480 to 6871 that's a very good indicator for a young and perspective coin. Number of successful sent or received transfers increased more than 14 times. This project becomes more and more interesting for investors every day.

#### Transaction Fees

Average Transaction fee is 0,94 Chain Link. The whole amount of fee on 03.05.2022 is 8260,72 Chain-link or 113 254.471\$.

## Hash Rate

As a representative of a contemporary consensus technology Proof of Stake, Chain Link cannot be mined as a coins like Bitcoin etc.

## Staking

Consensus algorithm Prof of Stake give an opportunity to get rewards through staking this currency. Yearly reward of Chain-link for today is 3.35 % from deposit.

### 4.7.2 Financial Metrics

The total number of Chain-link coins on 03.05.2022 is 467,009,550. Market Capitalization on 03.05.2022 is 6,402,700,930.50 \$

Market capitalization = Circulating supply \* Price

$467,009,550 * 13.71 = 6,402,700,930.50$  \$.

## NVT

### MVRV

On 03.05.2022 the coefficient of NVT of Chain Link is 594.39 that's an extremely high coefficient for that coin and means that Chain-link overvalued. But MVRV coefficient, on the other hand, is less than 1 what contradicts to NVT indicator.

**NVT(Link)** (Network value / Daily transaction volume)

$6,402,700,930.50 / 10\ 771\ 925,4554 = 594.39$

**MVRV(Link)** (Market value/ Realized value)

$6,402,700,930.50 / 10\ 771\ 925,4554 = 0,984222705$

### Stock to Flow model

Chain-link have a limited supply in 1 000 000 000 tokens. That means that there is no possibility to produce more. For today there are 467,009,550 tokens.

### **4.7.3 Project metrics**

#### **Team**

Chain Link team is a big community around the world, developers, academics, and experts with deep understanding of decentralized systems and smart contracts.

Technology

#### **Aim**

The main idea of chain-link is to expand the range of services of smart contracts. Chain-link will strive to ensure the productive, confidential functionality of its network. Its Oracle networks will ensure a strong minimization of trust through a combination of principled crypto-economic mechanisms such as Well-designed protective barriers and enforcement measures at the service level rely on the main chains.

#### **Roadmap**

The most important things on which Chain-link will concentrate are

- Hybrid smart contracts.
- Abstracting away complexity: Simple functionality reduces the need for developers and users to be conversant with complicated execution process and system limits.
- Confidentiality: Providing next-generation system by combining the inherent transparency of blockchains with powerful new data confidentiality measures.
- Order-fairness for transactions: Enabling transaction sequence in a way that is fair to end users and prevents bots and predatory miners from front-running and other assaults.
- Trust-minimization: Using decentralization, strong anchorage in high-security blockchain systems, cryptographic approaches, and crypto economic assurances, provide a highly trustworthy layer of assistance for smart contracts and other oracle-dependent systems.

## **4.8 Technical Analysis of Chain-Link**

## MA indicator



*Figure 15 MA indicator chart for Chain-link*

*Created by the author on TradingView*

On the Chain-link graph, the moving average is depicted as a bold black line and the price chart is depicted as red and green candles. The moving average is used by me with a period of 100 days. We see that on November 16, 2021, the price chart crossed the moving average line, which entailed a change in the trend. The price chart was below the moving average line, which tells us that a downward trend is beginning. The moving average line is also a downtrend resistance line. On the graph, we see that since January 5, 2022, the price has broken the level of resistance, but the downward trend continues.

## RSI indicator



Figure 16 RSI indicator chart for Chain-link

*Created by the author on TradingView*

On this graph, the price of Chain-link is represented as a green line, and the RSI indicator is represented as a violet line. The indicator signal line is also limited to the lower (30%) and upper (70%) levels. The optimal period for RSI is period 14. On the graph, we discovered a divergence, which can be highlighted with two short black lines. Divergence is the moment of a discrepancy between the values of the indicator and the price graph, which implies a rapid change of the trend towards the values of the indicator. In this case, we are dealing with a bullish divergence - this is when the minimums of prices are lowered, but at the same time the minimums of values of the indicator are raised. We see that in the second half of February 2022, the RSI line went beyond the lower level, and the indicator's minimums lined up toward growth, while the price minimums were directed downwards. The RSI indicated a further slight price increase. Currently, the line of the indicator does not hit the lower level of oversold.



## MACD indicator



Figure 17 MACD indicator chart for Chain-link

*Created by the author on TradingView*

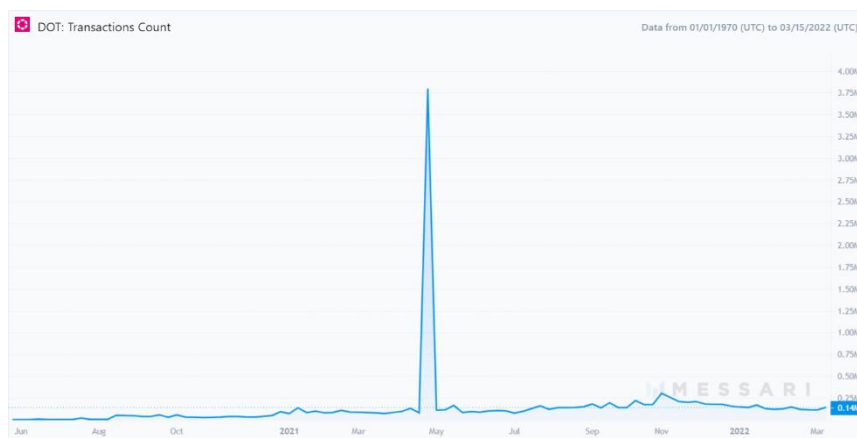
At the bottom of the Chain-link graph, we can see the MACD indicator. The MACD indicator line is depicted as a blue line, supporting signal line is depicted as an orange line, and the zero line separates positive values from negative values. The MACD line consists of a long EMA (26 days) and a short EMA (12 days), but since the work goes on longer periods there will be a replacement of EMA with SMA, as EMA is applied on short timeframes. The histogram shows how close or far apart the MACD line and the signal line are. The last big price collapse occurred on January 17, 2022, on which day the MACD line crossed the signal line from top to bottom, and this was displayed on the red histogram below zero. Then on February 3, 2022, the MACD line crossed the signal line from the bottom up, which was displayed on the green histogram above zero; the price was slightly reanimated. Based on the chart data we can see that after big collapses, the price of Chain-link was well recovered. On 13 February 2022, the MACD line again crossed the signal line from top to bottom. Based on indicator data I can assume that the price will soon drop slightly.

## 4.9 Fundamental Analysis of Polkadot

### 4.9.1 On Chain Metrics

#### Transaction Count

Polkadot is considered as a new coin on the market. Its existence counts from 25<sup>th</sup> of May where there made first 76 transactions. By the June of 2021, the number of transactions of Polkadot increased by 86618. That's an incredibly good indicator, considering that this coin exists only 2 years. On the Graph we can see a space – rocket high on the 26<sup>th</sup> of April. This is a day when Cryptocurrency market fell down and people tried to safe their investments.



*Figure 18 Number of Transactions of Polkadot*

*Source: MessariIo*

On the 3rd of March of 2022 were 116782 transactions. The transaction volume is 162 000 000\$.

#### Active Addresses

Number of Active Addresses is also has grown from only 23 on June 2019 to 23 247 on June 2021. Number of successful sent and received transfers from the beginning of period increased more than 1000 times.

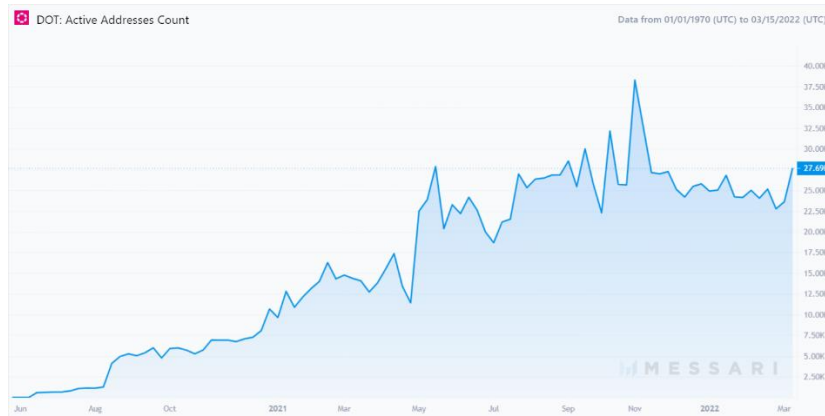


Figure 19 Number of Active addresses of Polkadot

Source: MessariIo

### Transaction Fees

Average Transaction fee is 0,11 Polkadot. The whole amount of fee on 03.05.2022 is 12846,02 Dot or 229 044.537\$.

### Hash Rate

The Polkadot using Proof of Stake consensus so it cannot be mined, only staked.

### Staking

Polkadot propose 13,94 % earning from investment yearly. That's a very good conditions if we take into account that Chain-link reward is 3.35 from the deposit.

### 4.9.2 Financial Metrics

The total number of Dot coins on 03.05.2022 is 987,579,315. Market Capitalization on 03.05.2022 is 17 608 539 186.45 \$

Market capitalization = Circulating supply \* Price

$987,579,315 * 17.83 = 17 608 539 186.45 \$$ .

### NVT

### MVRV

On 03.05.2022 the coefficient of NVT of Polkadot was 108,68 that almost acceptable number that a bit exceeds the border value of 95. This coin a little overvalued. Coefficient of MVRV, less than 3,7 what says that this coin is undervalued and indicates on long -term growth.

**NVT(Dot)** (Network value / Daily transaction volume)

17 608 539 186.45 / 162 000 000 = 108.69

**MVRV(Dot)** (Market value/ Realized value)

17 608 539 186.45 / 23 550 000 000= 0,984222705

### **4.9.3 Project Metrics**

#### **Team**

Founders of Polkadot are Robert Habermeier, Gavin Wood and Peter Czaban. Before the entering Polkadot, Gavid Wood was in a list of creators of Ethereum, after his leaving he created a project Polkadot. All of them are great developers and crypto scientists.

#### **Technology**

A better security models

Allow blockchains to share their security, which implies that the security of each blockchain is combined and applied to all. Blockchain developers may safeguard their blockchain from the start by linking to Polkadot.

#### **A green, energy-efficient protocol**

Polkadot's Nominated Proof-of-Stake (NPoS) model consumes a fraction of the energy used by traditional blockchains and has the smallest carbon footprint of all the proof-of-stake protocols studied in recent research.

#### **Transparent on-chain governance**

Updates to the network are made without forking by transparent on-chain voting, ensuring that protocol development never comes to a halt due to a lack of clarity. The relay chain has a complex governance system that aims to provide a transparent, responsible, and binding method for resolving disputes and network upgrades. DOT tokens are utilized to take part in governance choices such as proposal submission, voting, and bonding. Parachains are able to build their own governance procedures, allowing them to operate with the greatest amount of freedom while minimizing the impact on neighboring parachains.

#### **Aims**

Polkadot follows a generous goal – to make blockchain network secure. Their supply the

Polkadot technology which would keep blockchain developers safe from the first step of project creation. promote a worldwide network of computers to run a blockchain on top of which users may create and run their own blockchains.

### **Roadmap**

From the roadmap of Polkadot we can see those the main points:

1. Polkadot will be launched in Proof of Authority mode by the PoA Web3 Foundation. Most users will be able to do the following at this time:

Stake tokens and indicate their desire to validate or nominate by claiming tokens from their Ethereum contract.

2. The network will function with a decentralized group of validators during Nominated Proof of Stake. Web3 Foundation will utilize Sudo to increase the number of verifiers in the set throughout this phase.

3. Polkadot's governance system is now operational, allowing it to elect its first Council and Technical Committee, as well as begin accepting public submissions. While the Sudo key may be required for a few activities, the majority of the chain's choices may be handled through governance. Root calls will only be dispatchable via governance when Sudo is abolished.

## **4.10 Technical Analysis of Polkadot**

### **MA indicator**

As with previous crypto-assets, the MA on the graph is a black, bold line, and the price graph is a red-green candle. The long-term strategy will apply a moving average of 100 days. When determining the Polkadota trend, attention putted to the intersection of the price chart - the line moving average, which occurred on November 26, 2021. This intersection indicated a change in the trend from rising to falling. For the current period of time, Polkadot is in a global downward trend with the price falling.



Figure 20 MA indicator chart for Polkadot  
 Created by the author on TradingView

**RSI indicator**



Figure 21 RSI indicator chart for Polkadot  
 Created by the author on TradingView

Consider the Polkadot graph, where the violet line is the signal line of the RSI indicator moving between the oversold zone and the overbought zone. The top 70% is the overbought zone, and the bottom 30% is the oversold zone. The blue line, at 50%, indicates a downward or upward trend in prices. There is imagined that the signal line since the end of 2021 is trying to leave the oversold zone. The graph shows that as soon as the price falls, this crypto asset immediately begin to buy people. This shows that investors are interested in investing in Polkadot. At the moment, the line of the indicator has once again crossed the line of 50% to the overbought zone, which indicates a slight increase in the price.

## MACD indicator



Figure 22 MACD indicator chart for Polkadot

Created by the author on TradingView

The MACD line is the blue line on the indicator graph, which is the result of subtracting the long moving average EMA (26 days) from the short moving average EMA (12 days), but the exponential moving average EMA is used on short time intervals. So, there will be a replacement of EMA with SMA, which is applicable to longer timeframes. The orange line is a signal line used to get more truthful signals. Also, on the graph of the indicator, there is a

line passing through 0, above the zero-line positive values, and below it respectively negative values. The distance between the signal line and the MACD line is constantly changing due to the rise or fall of the price, these changes are clearly displayed on the histograms of green and red colors. The local downtrend is demonstrated by red histograms, and the local uptrend is demonstrated by green histograms. On February 19, 2022, the MACD line crossed the zero range from top to bottom, signaling a decline in the asset price. But on March 2, 2022, the MACD line crossed the signal line from the bottom up and was fixed above it. The green histogram showed a slight increase in price. At the moment, the MACD line has crossed the signal line from top to bottom, which precedes the price reduction.

## **5 Conclusion**

### **Ethereum**

Fundamental analysis has shown that the Ether coin is a slightly overvalued asset and is expected to decrease its price in the near future. This coin shows an active growth of daily transactions and active addresses that is an indicator of its interest in the market. The team of creators of this project are serious players and not the first year to be on the market. Ethereum will continue to grow and with the release of Ethereum 2.0 its assets will increase in price. In the technical analysis of the Ethereum cryptocurrency using the MA indicator, there were determined that the price is in a global downward trend. The RSI indicator showed that at the moment the asset is not overbought or resold. With the help of the MACD there were able to determine the further direction of the price. On these data the assumption can be made that a small decrease in the price of Ethereum is expected. The ether is a good long-term investment with an investment of \$2,000 and more.

### **Doge Coin**

Doge coin that's a good example of coin that artificially attracted attention of public through distribution in mass media, statements of influencers such Ilon Mask and different celebrities of mass media. Its financial indicators shows that the network is extremely overvalued and can be collapsed in any time. On Chain metrics shows passivity and no growth through time. This project does not perform any new technology what makes it almost useless. The MA technical analysis indicator gave us the understanding that the price of the crypto



asset is moving in a downward trend. Doge Coin is also close to the oversold zone as indicated by the relative force index. The MACD indicator signals a further slight drop in the price. There can be pointed out, that investors' interest in this asset has been low recently. This is a bad and inefficient investment that can lead to bankruptcy in any time.

### **Chain-Link**

Chain – Link is high-tech project that revs up every month. Its team – big community around the world the working on the project together. This project is highly technological that will try to bring the system of smart contracts on a new level. Their network Oracle also high-tech which can provide a decreasing in a trust-check need. On chain indicators shows the upcoming interest of that project, while financial metrics indicates on contradiction whether market overvalued or not.

During the technical analysis, indicator MA also confirmed the existence of a global downward trend. But in this case, while cryptocurrency is influenced by a downtrend, Chain-link was able to break through the resistance line. The RSI indicates that there is no strong oversold of the asset. It is likely that in the near future the price will decrease slightly based on the data obtained from the application of the MACD indicator. The attention can be drawn to the fact that the price of this crypto asset is able to recover perfectly.

This is a project with good foundation that can give profit even with small investments as less than 500\$.

### **Polkadot**

Here we can view a strong project with good prospects, aims and technology. When Polkadot runned its whitepaper, it immediately attracted attention of investors and brought it on the first lines of Crypto listing. That's a great long-term project that would be regularly developed. Metrics also show transaction and active address activity. MVRV and NVT coefficients indicates that this coin is more undervalued than overvalued.

Technical analysis tool - moving average indicator showed the movement of the price in a downward trend. Using the RSI indicator, there is a notation of the interest of investors in POLKADOT cryptocurrency. The MACD indicator signaled a slight decline in the price of this asset in the near future, but this is the usual situation for a downward trend.

Those all factors shows that Polkadot is a perfect investment with small and big budget.

## 6 References

- Anon., 2021. *An Overview of Bull and Bear Markets*. [Online]  
Available at: <https://www.investopedia.com/insights/digging-deeper-bull-and-bear-markets/>
- Anon., 2021. *MVRV Ratio*. [Online]  
Available at: <https://dataguide.cryptoquant.com/market-data-indicators/mvrv-ratio>
- Anon., 2021. *THE CRYPTO ECOSYSTEM AND FINANCIAL STABILITY CHALLENGES*, s.l.: International Monetary found.
- Binance, 2020. *Academy Binance*. [Online]  
Available at: <https://academy.binance.com/en/articles/a-guide-to-cryptocurrency-fundamental-analysis>
- Devries, P. D., 2016. *An Analysis of Cryptocurrency, Bitcoin and Future*, s.l.: s.n.
- EDWARDS, J., 2022. [Online]  
Available at: <https://www.investopedia.com/articles/forex/121815/bitcoins-price-history.asp>
- Fan Fang1, 2. C. V., 2022. *Cryptocurrency trading: a comprehensive*, s.l.: s.n.
- FERNANDO, J., 2022. *Relative Strength Index*. [Online]  
Available at: <https://www.investopedia.com/terms/r/rsi.asp>
- FRANKENFIELD, J., 2021. *Investopedia*. [Online]  
Available at:  
<https://www.investopedia.com/terms/c/cryptocurrency.asp#:~:text=A%20cryptocurrency%20is%20a%20form,of%20governments%20and%20central%20authorities>
- Hicks, P. L. a. C., 2022. *MoneyUsNews*. [Online]  
Available at: <https://money.usnews.com/investing/articles/the-history-of-bitcoin>
- Hops, J., 2013. *About cryptocurrency is simple. Bitcoin, Ethereum, Blockchain, Decentralization, Mining, ICO*. s.l.:s.n.
- Kochkodin, B., 2021. *Bloomberg*. [Online]  
Available at: <https://www.bloomberg.com/news/articles/2021-06-18/venture-capital-makes-a-record-17-billion-bet-on-crypto-world>
- Marr, B., 2017. *Forbes*. [Online]  
Available at: <https://www.forbes.com/sites/bernardmarr/2017/12/06/a-short-history-of-bitcoin-and-crypto-currency-everyone-should-read/?sh=5ecef3c33f27>
- Mi Yeon Hong, J. W. Y., 2022. *The impact of COVID-19 on cryptocurrency*, s.l.: s.n.
- Myfin.by, 2021. *MYFIN*. [Online]  
Available at: <https://myfin.by/stati/view/kripto valuta-token-moneta-v-cem-raznica-maksimalno-ponatno>

REIFF, N., 2021. *Investopedia*. [Online]

Available at: <https://www.investopedia.com/tech/were-there-cryptocurrencies-bitcoin/>

Safronov, V., 2021. *Free TON house*. [Online]

Available at: <https://freeton.house/ru/blokchejn-nachalo-istoriya-poyavleniya-samogo-pervogo-blokchejna/>

Scott, B., 2020. Cryptocurrency. *Journal on Internet Regulation*.

Stornetta, S. H. W., 1991. [https://www.anf.es/pdf/Haber\\_Stornetta.pdf](https://www.anf.es/pdf/Haber_Stornetta.pdf). p. 13.