Czech University of Life Sciences Prague

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Bachelor Thesis

The Place And Future Of Bitcoins In The E-Market

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Objectives of thesis

The main goal of this thesis is explaining the importance of “Bitcoin” recently and what part it is going to take in the future of Internet Marketing and investigate It's safety.

The partial goals are following: -ExplainBitcoinandIt'shistoryandIt'sincreasinganddecreasingvaluessinceIt'sinvented. -Discuss and explain "Blockchain" system and examine It's safety on Internet Marketing.

Methodology

The methodology of bachelor thesis is based on professional information sources, literature and academical articles.

It will be analyzed based on the information provided by resources above.

Based on theoretical knowledge, the summary and conclusion of the bachelor thesis will be formulated.

The proposed extent of the thesis

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Recommended information sources

Extance, Andy. “The future of cryptocurrencies: Bitcoin and beyond” Nature News 526.7571 (2015): 21.
Nakamoto, S. Bitcoin: A Peer-to-Peer Electronic Cash System (2008)
Walch, Angela. "The bitcoin blockchain as financial market infrastructure: A consideration of operational risk.” NYUJ Legis. & Pub. Pol'y 18 (2015): 837.

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Declaration

I declare that I have worked on my bachelor thesis titled “The Place and Future of Bitcoins in the E-Market” by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 11/ 03/ 2021 _____

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The Place and Future of Bitcoins in the E-Market

Abstract

Throughout history, different types of money have emerged in line with changing needs and conditions. The latest example of this is cryptocurrencies that have entered our lives with Bitcoin, which, thanks to blockchain technology, can operate without the need for a central authority, unlike its predecessor currencies.

There are too many sub-coins that have been derived using virtual money infrastructures. The total market volume that mediates the digital currency trade has been over 900 billion USD in 2021. Due to the lack of physical value of the virtual money in question and the difficulties of changing a settled order, the number of those who are distant from the system is very high. While many countries in the world have a positive perspective towards Bitcoin; At the same time, it warns its citizens about the risks that may arise due to sudden changes in price movements, not being indexed to any assets and not relying on any central authority. The study prepared in this context was carried out to determine the place and future of Bitcoins in the market.

Keywords: Coin, Bitcoin, Electronic Market, Crypto Money, Electronic Marketing.

Místo a Budoucnost Bitcoinů na Elektronickém Trhu

Abstrakt

V průběhu historie se objevovaly různé druhy peněz v souladu s měnícími se potřebami a podmínkami. Posledním příkladem toho jsou kryptoměny, které vstoupily do našich životů s bitcoiny, které díky technologii blockchain mohou na rozdíl od svého předchůdce fungovat bez nutnosti ústředního orgánu.

Existuje příliš mnoho dílčích mincí, které byly odvozeny pomocí infrastruktur virtuálních peněz. Celkový objem trhu, který zprostředkovává obchod s digitální měnou, dosáhl v roce 2021 více než 900 miliard USD. Kvůli nedostatku fyzické hodnoty dotyčných virtuálních peněz a obtížím se změnou vypořádaného příkazu je počet těch, kteří jsou od systému vzdálení, velmi vysoký. Zatímco mnoho zemí na světě má pozitivní pohled na bitcoiny; Zároveň varuje své občany před riziky, která mohou vzniknout v důsledku náhlých změn cenových pohybů, nebudou indexovány do žádných aktiv a nespoléhají se na žádný ústřední orgán. Studie připravená v této souvislosti byla provedena s cílem určit místo a budoucnost bitcoinů na trhu.

Klíčová slova: Mince, Bitcoiny, Elektronický Trh, Krypto Peníze, Elektronický Marketing.

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1. Introduction

Today, due to the development and cheapening of technology, the widespread use of the internet, and the reluctance of people to carry paper money, new types of money such as electronic and virtual money have entered our lives. The latest example of this is the cryptocurrencies that come up with the Bitcoin system, which allows money transfer from spouse to spouse without the need for any central authority thanks to blockchain technology. Although many cryptocurrencies have emerged since 2009, Bitcoin is still the most known.

Due to its nature, Bitcoin is not subject to the regulation and supervision of any country. The price of Bitcoin is determined according to the supply-demand conditions in more than 100 crypto currency trading platforms worldwide. It is still a matter of debate whether Bitcoin, which has highly volatile price movements and has been adopted by a limited audience, fulfills monetary functions with these features. In December 2017, Bitcoin began to be used as an underlying asset in organized exchanges. In this way, individual and institutional investors have the opportunity to trade Bitcoin for protection or speculation in a regulated market.

Considering the performance of cryptocurrencies in the last decade and the increase in the number of users, it is clear that the developments in this field will accelerate. This rise is thought to be effective both in the ecosystem of cryptocurrencies and in the development of technological innovations.

It is thought that the developments in this field with electronic payment tools and systems, which are one of the popular research topics around the world, will be equally important for the future. With the development of technology, there is only a time difference between continents. Today, fund transfers can be made from one end of the world to the other in a single move, regardless of location.

The general purpose of the study on “The place and future of Bitcoins in the e-market” prepared in this context is to put the concept of crypto money there and to predict the future of virtual currencies in the e-market. In the conceptual part of the study, the concept of crypto money, an overview of Bitcoin and the future of crypto currencies are examined. Finally, the study is completed with the conclusion section where comments and evaluations are made on the subject.

2. Literature Review

2.1. Crypto currency

The development of technology has been the pioneer of innovation in many fields. One of the areas affected and transformed by technology is virtual or in other words, cryptocurrencies that are examined within the framework of finance. In this part , the concept of crypto money is examined.

2.1.1. Crypto currency concept

Cyripto money is a collection of data written in hundreds of codes with monetary value. The reason why it attracts more attention than other currencies in the world is its organic structure. In other words, crypto coins are not controlled and managed by a government or center (Alptekin et al., 2018, p. 60). Cryptocurrency is a virtual currency system like a standard currency that is used as a means of payment in the purchase of goods and services, providing a means of payment to individuals without being tied to a reliable central system. Cryptocurrencies depend on the communication of digital data and using cryptographic (encryption) methods, they ensure that they are legal and singular (Farell, 2015, p. 4).

Crypto coins are intangible coins. It can be converted into physical currencies. While Bitcoin (btc) is the best known, there are over a thousand varieties such as Ethereum (eth), Litecoin (ltc), Ripple (xrp) and IoT. Crypto coins are decentralized, not subject to a specific institution or organization, and are not included in a structure that determines their value. It is driven by the encryption community. They are not valid worldwide and are accepted in some legal framework (Nebil, 2018, p. 20). Cryptocurrency is a system based on blockchain technology that exists only online. How much each individual has in their account and the transactions performed in the account are recorded in a database. In this sense, the system is the same as the banking system. Money is sent to another account with an account number consisting of the numbers associated with your account. There is no physical change. This is nothing more than the information recorded in a database, only numbers are transferred from one place to another. It is thought that the future will be in this direction with the transformation of crypto money types into a structure controlled by people, not from a central authority like banks (Extance, 2015, p.21).

Growing and becoming widespread day by day enables crypto coins to be recognized and used to buy goods and services. Bitcoin is the most well-known among crypto currencies. Businesses are trying to discover Bitcoin and other cryptocurrencies. however, Bitcoin's destructive superiority does not seem to be overcome easily. Many of the world's leading companies accept payments with cryptocurrency, and these companies are increasing day by day. Very serious companies such as Playstation accept payments with crypto money (Atabaş, 2018, p. 121-123).

Cryptocurrencies are based on the basis of less production and the purpose of this is to create market volume and market value. This situation is different from the monetary system used by states. States can print money in any situation and conditions they want. But cryptocurrencies such as Bitcoin will never be produced more than 21 million units (Nakamoto, 2008: 5).

2.1.2. Crypto currency types

In this section, the most widely known and traded crypto currency types in the market are mentioned.

2.1.2.1. Bitcoin

Bitcoin is a cryptocurrency that cannot be secured by any institution whose acronym is BTC(Sönmez, 2014, p. 8). The fastest way to pay nowadays is to give cash by hand. If the person receiving the payment does not see an abnormality in the money, he accepts the payment. The first thing that comes to mind when asking how we can make a payment faster to a person or institution we are not with is that you use EFT, Money Order, PayPal, Western Union or a similar payment tool. However, you always use a vehicle for these. When you enter the vehicle, commission is paid, time is wasted, and you share a lot of your private information with the vehicle. Bitcoin is the cryptocurrency that makes it possible to pay securely from person to person without an intermediary. Crypto, the word encryption, should not be confused with the login password in internet banking. It is the encrypted version of the computer record with monetary value (Güven ve Şahinöz, 2018, p. 29-31). Although Bitcoin is the first crypto money, it is a crypto currency that is increasing in popularity day by day. Bitcoin was developed by Satoshi Nakamoto on November 1, 2008. The introduction of this crypto money was written in a mini article by

Satoshi Nakamoto and titled "Bitcoin: A Peer-to-Peer Electronic Cash System", ie person-to-person electronic cash system (Nakamoto, 2008, p. 1).

2.1.2.2. Ethereum

Ethereum is among the most well-known crypto currencies after Bitcoin. Vitalik Buterin, the founder of Ethereum, published the Bitcoin magazine magazine in 2011 and offered to write code into Bitcoin in 2013. However, when he could not find a positive response, he proposed a different crypto currency that can be encoded. It was the second largest cryptocurrency with a market value of 100 billion in 2018. Ethereum's code is ETH, and the currency is Ether. Ethereum mining is done with the graphic processors unit, not the processors. Due to the high amount of technical equipment and investment for bitcoin mining, mining at home has decreased considerably recently. However, Satoshi Nakamoto set out to produce a completely decentralized production. The biggest criticism for Bitcoin is that a few large miners dominate the system. In Ethereum mining, Ether production is quite decentralized, as home computers are used, not ASICs (a kind of chip) (Güven ve Şahinöz, 2018, p. 103).

2.1.2.3. Ripple

Ripple (XRP), which was launched in 2012, is not based on Blockchain technology. They have a different structure from Bitcoin in this respect. Despite not having a centralized structure, Ripple distribution is done by Ripple laboratories. 20 percent of Ripple, which has 100 billion units, is in the founders of Ripple. 25 percent of it is located in Ripple labs, the rest is reserved for distribution to grow the system. In Ripple, all books are closed smoothly from the beginning. With Ripple, it is possible to make transactions in a short time and payments can be made at very high speed. Ripple is used by major banks and other corporate companies providing financial services. Ripple serves as a bridge between the rarely tradable currencies and to prevent virtual attacks (Armknecht et al., 2015, p. 166).

2.1.2.4. Litecoin

It was created by Charles Lee, a former Google engineer, to speed up Bitcoin. The speed of block creation is very advanced and thus transactions are carried out very quickly. Its abbreviation is LTC. The major disadvantage of this cryptocurrency is that some of the

blocks are left unattended due to Blockchain volume growth (Nebil, 2018, p.47). Litecoin has a production limit of 84 million, not 21 million like Bitcoin (Güven & Şahinöz, 2018, p.119).

2.1.3. How cryptocurrency works?

In this section, the functioning mechanism of crypto currencies is examined in detail.

2.1.3.1.Cryptocurrency mining (Cryptomining)

Cryptocurrency mining is the process of approving and adding transactions through a public ledger known as a blockchain. Mining is to prove and verify the accuracy of the transaction. Thus, through the process of complex algorithms to add a new block to the blockchain, it is the process that verifies the validity of the block. Anyone who has the proper hardware and internet access can be a miner. Miners earn rewards by solving riddles, that is, they get their share of everything they produce. For mining, it is necessary to have good hardware, good mining software and a Bitcoin wallet. The other most important cost for miners is electrical energy. A high electrical energy is needed both to operate the system and to cool the system (Nebil, 2018, p.56).

Bitcoin, which is not produced connected to a center, is similar to a point-to-point distributed structure, showing the network feature. All payments (payment orders) made in this network system reach other users instantly, so how much payment from which user to which user is reflected in the records. These collected records are stored in structures called blocks. A Hash (hash) algorithm that requires a high level of processing is implemented on each block. It is desirable to find an expression starting with a certain number of zeros. The first user to perform this transaction is awarded a decreasing amount of Bitcoin over time. In this way, Bitcoin is launched. In this way, the records of the transactions are kept under record clearly for each user. Each block contains the hash expression of the last block that precedes it. The process of creating money is called mining (O'Dwyer & Malone, 2014, p. 280-285).

Bitcoin mining; It was created by Nakamoto not to let people make money, but to get Bitcoin transactions approved and keep the system flowing. Bitcoin, which is limited to 21 million by software, will continue to exist after reaching this number. Because the crypto currency exchange must be approved by the miners in order to take place. In this case, we

can infer that mining will not actually end. Miners are given a certain share in Bitcoin exchanges for each transaction confirmation (Nakamoto, 2008). Bitcoin aims to create an algorithm on your computer every 10 minutes, using a virtual program. The computer that creates this algorithm, the miner, wins a certain Bitcoin as a reward. It is impossible for people who aim to make a profit through mining to achieve these goals at home with a single machine. As with any technology, these devices and devices will wear out. As Bitcoin difficulty increases, your devices will become unable to solve this and will have to renew. If you do not make or delay these refreshes. The system will start to lose money (İnci & Alper, 2018, p.52).

2.1.3.2. Cryptocurrency blockchain

Blockchain acts as a registry where transactions made with cryptocurrencies are recorded. Blockchain is realized through Blockchain by a network where users running an innovative software communicate with each other (Brito and Castillo, 2013, p.8).

Person A sends X amount of Bitcoins to Person B message is forwarded to each unit connected to the network through software applications that are ready. Users connected to the network can evaluate transactions, add the messages they receive to their registry copies, and share these log attachments with other users connected to the network. In this way, users connected to the Bitcoin structure have their own data chain copy. And the transaction history of Bitcoin transactions and the information to whom it belongs can be obtained (Antonopoulos, 2014, p.17).

Although the idea of blockchain was launched in 2008, there is confusion in its definition, as many industries can use it differently. Blockchain technology consists of the logic of sealing the data to be stored in blocks and forming a chain from these blocks. As a result of writing and filling the data in blocks, it becomes easier to be chained in front of the previous block and to change and preserve these data retrospectively. The fact that the blockchain has a distributed structure increases the security dimension. Namely; The data added to the blockchain are recorded simultaneously. If something happens to a few from any computer, the current version of the block chain will be copied from other computers and the system will be automatically protected. Thus, there is no question of his loss. When the data stored in the blockchain is tried to be changed by malicious people, the security provided by the distributed structure comes into play, it realizes that it has changed the

records on a computer included in the system, the original of this data is simultaneously corrupted and leaves that computer out of the system. According to the basic logic of the system, transactions are sequentially recorded on a blockchain and a chain is formed where the backward data will not be changed and will not be broken. Although Bitcoin advocates believe that this system will end the banking and finance sector, the sector that has adapted the fastest to this technology today has been the banking sector. This system, which emerged with Bitcoin, is discovering new usage areas by people every day and commercializing them (Aksoy, 2018, p.27).

2.1.3.3. Hash in cryptocurrency

A hash function is an algorithm or subprogram that maps variable-length data sets to fixed-length data sets. The values returned from hash functions are called hash values, hash codes, hash sums, checksums, or simply hashes. Hash functions are used to quickly find a data that is usually searched in a table in the database or to speed up data comparison processes, to detect identical or similar records in a large file, to find similar sequences in a DNA sequence, etc. used for transactions (Gültekin, 2017, p.102).

The hash function is a function that converts data of any length, whether short or long, into a fixed-length data. There are more than 20 Hash function algorithms. SHA series are very popular in these. SHA-0 was developed in 1993, SHA-1 in 1995 and SHA-2 in 2012. The commonly used SHA-256 Hash function. This Hash function, which produces 256-bit output, has five properties (Güven & Şahinöz, 2018, p.50).

- The same input should always produce the same output,
- The function should produce output quickly,
- It should not be possible to calculate the input using the output,
- It should generate a new and different Hash value even with a small change in the message,
- Different inputs should not produce the same result.

This hash function is an important element in connecting blocks to each other, forming a block chain and ensuring its immunity. Each block in the chain is linked by these Hash values. Changes to the blocks will also change the hash value and therefore the Hash value of all remaining blocks will be changed. In the SHA-256 hash algorithm, no matter how large the data is, the area to be covered cannot exceed 256 bits. The number of

SHA-256 summary data variations is 2 ^ 256. This number is greater than trillion and quadrillion (Alptekin et al., 2018: 43).

In SHA-256, regardless of the message input, the message digest is a string of 256 consecutive 0 or 1s. For ease of reading, they are usually written in hexadecimal groups in groups of four. In this case, message summaries are written using 64 consecutive letters (0,1,2,3,4,5,6,7,8,9, A, B, C, D, E, F) (Çarkacıoğlu, 2016, p. 21).

Hash function is a one-way function that turns the content information contained in the blocks into summary information. Hash function creates a unique output for each data only. Creates a new summary by changing a new data entry summary that is entered into the system. Each summary is linked to the previous summary. It comes from the chain expression in the definition of Block Chain. The starting block was created by the designer and this block name is called "genesis block" (Emen, 2018, p.48).

2.1.3.4. Proof of work

Proof of work method is used if it is manipulated by miners or if 2 different results come from 2 different miners. It needs to verify whether the transaction in question is correct or not. After the processor consumption with proof of work is realized, the block is not changed unless the same work is done. This does not seem possible at the moment. Since each block in the chain depends on its own priorities, making a block change means recalculating the next ones (Alptekin et al., 2018, p.49).

he hash function used for proof of work is usually SHA-256. SHA-256 hash function produces an output from 256 consecutive and random numbers consisting of 0 and 1. We can express this 256-bit array as an integer. After adding an additional message to a fixed message and summarizing it with SHA 256, the computer that wants to prove the work is asked to have the numerical equivalent of the summary obtained less than a predetermined number. Since the SHA-256 hash function is an encrypted and secure algorithm, the system cannot find additional messages without repeated attempts. It is difficult to find additional messages, but it is very easy to check if the message is found. The smaller the difficulty target, the more difficult the proof of work will be. A proof of work; it is a piece of data that is difficult to obtain in terms of time and cost. It must be controllable in very simple ways that this data hits the target. Generating a proof-of-work can be a very low probability random process so a lot of trial and error may be required to reach the goal.

There are other cryptocurrencies that do not use the proof-of-work system. These cryptocurrencies meet the requirements of the system in other ways (Bentov et al., 2016, p. 1-2).

2.1.4. Cryptocurrency markets

In order to trade on crypto money exchanges, users must first register on the relevant platform and have their credentials confirmed. The process of authentication of identity information has been implemented by many exchanges, especially in recent years, in order to eliminate the bad reputation that crypto coins have gained through illegal transactions in the first years of their release. On these platforms, users have the freedom to store the cryptocurrencies they have acquired on the platform, as well as transfer them to their online or offline virtual wallets (Walch, 2015, p.837).

As in traditional exchanges, in these platforms, users can use simple order types such as limit, market or strategy orders such as "take-profit", "stop-loss". The market prices of crypto currencies are formed according to the supply and demand balance on these platforms. These platforms function as spot markets for cryptocurrencies. According to Coinmarketcap.com site, there are more than 100 crypto money exchanges around the world as of February 11, 2021.

Table 1 Top 10 most traded cryptocurrency exchanges

	Last 24 Hours Trading Volume ($)
Binance	$29,108,071,702
Huobi Global	$10,254,156,573
Coinbase Pro	$5,105,987,509
Kraken	$2,358,959,476
BitFinex	$1,784,302,674
Bithumb	$1,785,535,733
Bitstamp	$1,070,889,320
KuCoin	$926,800,883
Binance.US	$600,758,264
Bittrex	$358,193,157

Source: https://coinmarketcap.com/rankings/exchanges/ (02.02.2021).

On December 1, 2017, the derivatives markets regulator in the USA (CFTC-Commodity Futures Trading Commission) granted CME and CBOE, one of the world's largest derivatives exchanges, to open Bitcoin-based futures contracts. First, on December 10, 2017, the CBOE, then on December 17, 2017, the CME exchange opened Bitcoin futures. For a while, Bitcoin futures contracts were traded on cryptocurrency exchanges such as BitMex and CryptoFacilities, but with this development, Bitcoin trading started to be traded under the US federal regulation in an organized exchange (Dilek, 2018, p.10).

2.1.5. Cryptocurrencies in markets

Crypto coins are bought and sold in markets called crypto money exchanges or crypto money trading platforms. On these platforms, crypto money - traditional money and crypto money - crypto currency exchanges can be performed online. The founders of the platform offering the service earn a certain amount of commission income from each transaction.

Table 2 Top 10 cryptocurrencies by market cap (Feb 2021)

Num	Crypto Currency	Market Capitalization	Current Value	Transaction Volume (24 hours)
1	Bitcoin (BTC)	$903,075,904,596	$48,484.50	$74,817,311,046
2	Ethereum (ETH)	$207,928,553,301	$1,818.23	$36,956,739,421
3	Cardano (ADA)	$27,275,325,030	$0.8783	$8,369,008,400
4	Polkadot (DOT)	$26,256,612,256	$28.85	$5,121,240,765
5	Ripple (XRP)	$26,180,578,875	$0.5739	$11,019,801,699
6	Binance Coin (BNB)	$20,449,054,889	$132.69	$2,524,518,332
7	Litecoin (LTC)	$14,382,751,409	$219.50	$13,077,903,601
8	Chainlink (LINK)	$13,984,891,240	$34.28	$4,727,215,861
9	Bitcoin Cash (BCH)	$13,945,017,371	$744.17	$15,184,930,381
10	Stellar (XLM)	$11,880,775,438	$0.5362	$3,024,537,784

Source: https://coinatmradar.com/, (15.02.2021).

As it can be understood from Table 2, bitcoin, which brought its market volume closer to 1 trillion dollars in 2021, appears as the most valuable crypto in the crypto money market. After bitcoin, coins such as etherium, cardano, polkadot, ripple appear as the most valuable coins of the crypto market, whose market value reaches approximately 1.5 trillion dollars.

2.1.6. Advantages and disadvantages of cryptocurrencies

Cryptocurrencies have advantages and disadvantages. Therefore, some countries legally use virtual currency, while some countries prohibit the use of virtual currency. In general, the positive and negative aspects of crypto coins are explained in detail below.

Advantages;

There are many advantages of using crypto money. For example, transactions are fast, they are inexpensive in terms of transaction costs, states cannot be seized because there is no dependency on central governments. There is no possibility of stopping or reversing the transaction, and your payment information cannot be collected and shared by anyone. Cryptocurrencies are easier to store thanks to the blockchain and do not cause security issues, there is no need for a bank to store it, it is a currency whose absolute owner is the user. It is possible to trade cryptocurrencies without intermediaries and trust. These transactions can be seen transparently and instantly. In addition, inflation risk is low in cryptocurrencies, while the increase in the real money supply in circulation causes inflation, this is not the case with crypto coins. Compared to cryptocurrency with traditional money, the risk of cryptocurrency collapse is low. While the collapse of real currencies is caused by excessive inflation from governments, cryptocurrencies do not depend on a central authority. While traditional money looks at physical money for security purposes, verification of transactions in electronic money and protection of privacy and data integrity are provided by cryptography (encryption). Electronic money is not physically changed manually and remote payments can be made easily (Kenger & Tokmak, 2018, p.4700).

In short, cryptocurrencies offer users advantages over traditional currencies. The advantages of cryptocurrencies are generally summarized as follows (Hendrickson et al., 2016, p. 928).

- Crypto currencies operate largely outside traditional financial institutions and regardless of national borders. For this reason, many users exceed the current regulatory framework.
- When trading with cryptocurrencies, there is no disclosure, reporting or investigation into large transactions. There is no distinction between sending funds to Arkansas or Afghanistan, regardless of origin.
- Also, users in the system can only be identified by their virtual addresses. Cryptocurrency brokers require users to link their Cryptocurrency addresses to a traditional bank account. However, it is not possible to use cryptocurrencies without creating an account with these intermediaries.
- Users can receive and transfer cryptocurrencies without even identifying themselves in the physical world. Therefore, it can be said that cryptocurrencies provide non-counterfeit exchange.
- Cryptocurrencies are processed over a distributed network, so there is no central entity in the system. The relative importance of a user is determined by the amount of computing power it provides to the system, and a single user is not required for the operation.

2.2. An overview of bitcoin

Bitcoin is all of the issues and concepts that make up the digital currency economic structure. It consists of open source applications. Programs run on large scale processors including laptops and android phones (Antonopoulos, 2014). Bitcoin is the first cryptocurrency. Btc was created on the first day of November 2008 as a result of the intense work of Satoshi Nakamoto, who worked at a Japanese software company. The introduction of this virtual currency to the world public was realized with a small article named "Bitcoin: A Peer To Peer Electronic Cash System" (person-to-person digital cash sending module), signed by Nakomoto (Nakamoto 2008, p. 1).

Bitcoins are used with the abbreviation "BTC" and its symbol consists of 2 lines descending from the upper and lower part of the letter B. Cryptocurrencies can be grouped like local deposits. Local deposits are assets that express a measure of tangible value that do not contain precious metals, but can be exchanged for goods or services. It is stated that the determination of local deposit values is obtained from the law or the institutions that

have adopted it (Velde 2013, p. 2). The difference between Bitcoin from local deposits is that it is not dependent on any central authority and is far from control.

2.2.1. Bitcoin structure

Bitcoin is a purely electronic or digital currency like all virtual currencies. Transferring currency involves the electronic transfer of file information between the seller and the Bitcoin buyer. To obtain and own Bitcoin, a user must download Bitcoin management software. This software connects your computer to a peer-to-peer network of computers in the Bitcoin system, called "nodes". Each program covers the history of each validated Bitcoin transaction known as a "block chain". The chain originates from a single original blockchain known as the "genesis block". Owning the blockchain allows the user to verify the validity of future transactions, which is a critical step in the Bitcoin system (Akins et al., 2014, p.34).

Virtual currency, also called crypto money, can be created in distributed networks by network users by analyzing some complex mathematical codes. At the same time, in the case of Bitcoin, the maximum amount that can be produced by the virtual currency generation algorithm is predetermined. Since they can be produced with a certain algorithm, they are not subject to regulation, that is, they cannot be produced in the desired amount when desired. Another point is the ability of money to perform its basic functions as a result of the value attributed by the community that agrees to use virtual currency. In fact, in terms of this feature, there is no difference between any tool used as money. Both precious metals and fiat money, which have been used as currencies until now, can fulfill the classic functions of money as a result of people's willingness to use these tools in exchange for goods and services. In this context, the basic elements of Bitcoin are summarized below (Dulupçu et al., 2017. p. 2243-2247).

- Network Structure: Peer-to-Peer, (End-to-Peer, P2P): The Bitcoin network is designed to deal with peer-to-peer (end-to-end, P2P). Server structures are used extensively in network structures. The usefulness of this structure is that it provides information about the entire structure of the network. However, the downside of this build is that all traffic on the network can accumulate at some point and a potential problem could damage the entire network. End-to-end network structures have been developed as an alternative to server / client-centric network structures.

Instead of connecting computers to a server in these network structures, each computer can connect to all computers by address without the need for an intermediary such as a server. This provides privacy and makes it almost impossible to track users on the network.

- Bitcoin can be transferred in a very short time over the end-to-end network system. There is no need for intermediary institutions such as banks or financial institutions to carry out transfer transactions through this network. Users included in the Bitcoin network have their own digitally generated identity. This is an infinite number of digital identities. In this way, the privacy of users can be ensured. Users who want to transfer Bitcoin can use a different digital ID for each transaction. In this way, it is possible to avoid relationships between IDs used to reveal the user's original identity. As a matter of fact, no contract has been defined between the sender and the receiver in transactions on the Bitcoin network. The identifier of the sender and recipient remains encrypted. Bitcoin offers a reliable form for sending money online.
- Blockchain: Bitcoin technically solves the trust problem with the Blockchain (Block Chain) method as a system that is completely produced and operated in a virtual environment. The Blockchain method is a system that contains all information about all transfers made within the Bitcoin network and enables all users on the network to access all information. The system is based on the sequential sequence of each transaction approved by users joining the network. In this way, all transactions in the Blockchain are stored in a single file and can be accessed by anyone who wants.
- Mining: Bitcoin mining is a somewhat complicated process. First of all, the processing power is as high a processor as possible and a fast internet connection is required. There are many online networks that list the latest Bitcoin transactions in real time. The next step is to log into the system with a Bitcoin client and validate these transactions by evaluating blocks of data called hashes. Since the information studied is encoded (encoded), it is necessary to check the accuracy of the solution reached by the miner. When the solution is verified by other miners in the network, the transfer is confirmed and the miner who first reaches the solution is rewarded with a certain amount of Bitcoin. The amount of Bitcoin given to the solution owner started with 50 Bitcoins and is half of the 210,000 block solution, which is

an average of 4 years. The amount awarded to miners is 12.5 BTC. Miners around the world compete to reach a solution first, and it takes an average of 10 minutes to confirm a transaction. It is designed to automatically set the math problem (crypto) to be solved to confirm the transaction. If the duration of the problem is less than 10 minutes, the problem automatically becomes more difficult and the problem becomes easier.

- Bitcoin Ecosystem: Bitcoin has also created an economic field of activity in line with the increase in popularity and therefore investment. This section is examined in detail in section 3.2 of the thesis study.

The decentralized structure of Bitcoin, based on the contribution of its users, rather than a decentralized one, implies that the dynamics of its economy can be strongly influenced by social factors consisting of interactions between market actors. The Bitcoin blockchain is a public ledger that contains the complete record of all public transactions in Bitcoin currency history. Each node of the Bitcoin network running a Bitcoin software client keeps a copy of the blockchain. Analysis of the blockchain as well as the number of downloads of the software client provides two approaches for the real number of new Bitcoin users at any given time (Garcia, et al., 2014: 2).

2.2.2. Bitcoinin history

The history of Bitcoin begins with the global financial crisis in 2008. In this international financial crisis in 2008, world countries preferred to print money and reduce interest rates in central banks in order not to remember the Great World Burhan, which started as a black Thursday on October 24, 1929 and showed its effect at the highest level in the 1930s. Many banks that came to the spouse of the bankruptcy were rescued from this situation, but the return of this recovery was reflected in the society as a decrease in the values of deposits and the increase in taxes (Brand, 2016, p.208).

The change introduced by Nakamoto has prevented duplicate consumption with a system that verifies the transfer transactions within ten minutes using distributed system powers. Satoshi Nakamoto envisioned a new solution to the problem of "Byzantine Generals", which is perceived as the problem of how data will be distributed in a suspicious and potentially fake, distributed processor module, without a central power, with the definition of "proof of work". Although there was no news from Satoshi

Nakamoto since the 4th month of 2011, the order continued to operate completely transparent and within the boundaries of mathematical rules (Antonopoulos, 2014, p. 330).

2.2.3. Differences between bitcoin and the traditional monetary system

Differences of Bitcoin from local currency in terms of financial structure and transactions (Brand, 2016);

- There is no manager, agent or controller in the Btc network. It consists of voluntary participating computers that are linked end-to-end in the Bitcoin network. All connected computers run the same program with open source code, all see all the transactions done, everyone can keep all transaction history and retrieve transaction histories from other ends whenever they want. In summary, the Bitcoin network does not have a centralized structure.
- While a reliable third party is required for the transactions of digital fiat currencies, there is no need for a third party and security in the Bitcoin system. The costs are quite high in the brokerage system and it is possible to experience security gaps.
- One of the most important features of Bitcoin is that it is not a debt, but a value carrier. The money in the bank accounts is a kind of debt bond. An account at the bank shows its debt to its customer. Bitcoin, on the other hand, does not show a debt. The control powers of banks and country-led administrations over bank accounts, Bitcoin is also out of the question. No authority in the world can prevent the use of Bitcoin, nor can it undo a Bitcoin transaction that has occurred.
- Countries can take economic measures that can affect the value of the money in the bank with the money supply and limitation. However, banks and governments do not have any influence on the Bitcoin supply. Extra money cannot be added to the system. The money supply is in the form of rewards provided to producers who can form a successful block.
- Transactions are anonymous, carried out with usernames. Transactions are not related to real individuals, companies, accounts in financial institutions. Transactions occur between Btc accounts. Btc accounts are crypto signs. Despite these conditions, it cannot be said that it is one hundred percent anonymous.
- Transfers are transparent, fast and international. From the first Btc production in 2009 to this time, all transactions can be monitored by anyone who requests. These

transfers spread to the cryptocurrency system almost instantly all over the world, and they are approved in a very short time.

- There is no memory of transfer transactions in local deposits. Btc process memory is saved in Blockchain databases, which is a global ledger. Whether someone who will use Btc has Btc or not is determined by following the previous records.
- In the Bitcoin system, any power, administration, person, information systems expert, or any of the miners, including the programmers of this system, approved and accepted by the others and added to the Block-Chain, cannot make changes on a transaction and a transaction for retrieval can not.
- In order to be able to make transactions in Bitcoin, there is no obligation to obtain permission from any institution or person beforehand, or there is no obstruction by any organization or person.
- The system is reliable. The security of the system is ensured by using cryptographic digital signing methods that are mathematically proven to be reliable. It is impossible for malicious people to fake routing data on the data due to the use of public / secret key encryption method.

2.2.4. Features of the working mechanism of bitcoins

The features of the Bitcoin working mechanism are as follows (Teker, 2019, p.30). Bitcoin çalışma mekanizmasının özellikleri aşağıdaki şekildedir (Teker, 2019, p. 30).

- In order to use Bitcoin, a free download is required to the computer.
- Owned Bitcoins are stored in the digital wallet on the computer.
- It consists of a Bitcoin digital signature chain.
- It is impossible to be cloned.
- It is not possible to use it for double expenditure.
- It is not possible to receive the transaction made in transfer transactions made with Bitcoin.

2.2.5. Bitcoin’s place and future in the markets

The first purchase with BTC was completed on May 22, 2010. A user with the alias Laszlo Hanyecz bought 2 pizzas online from Dominos; paid 10,000 BTC in return (Surda, 2014: 4). Due to the use of BTC as a clearing tool for the first time in history, May 22 is celebrated as "Laszlo's Pizza Day" in many cities around the world.

Considering the history, it is seen that gold and silver have been popular in coin minting for thousands of years. Compared to other elements, gold and silver have a low melting point, so they are easier to turn into coins, bullion and jewelry. However, gold was preferred more because of the darkening of the silver. Gold has been chosen as a safe investment tool for inflation and economic irregularities, given its characteristics such as permanence, rarity in nature, and easy fragmentation. In a turbulent market, BTC can be used to protect capital and generate profits, and is compared to forex contracts as it is not a tangible investment tool. While transactions in Forex markets are open 5/24, this situation is 24/7 in bitcoin markets. In terms of daily trading volume, the forex market is trillions of US dollars, and the smaller and new bitcoin market is at much lower levels, such as 200 million US dollars (Çarkacıoğlu, 2016, p.20). Today, according to the "coinmarketcap" data, we see that it has reached the level of 900 billion dollars.

Table 3 Comparative Bitcoin market values

Values	**December 2016**	**June 2019**	**February 2021**
Total BTC On The Market	16.018.575 BTC	17.704.137 BTC	18.628.875 BTC
Market Price Of 1 BTC	752 $	10.800,75 $	48.900,75 $
Market Value	12.069.035.148 $	192.300.000.000 $	910.385.521.379 $
Daily Trade Volume	195.432.628 $	3.180.000.000 $	69.534.458.285 $

Source: https://coinmarketcap.com/, (15.02.2021).

Bitcoin exchanges (such as Bitcoin Market, Mt Gox) became operational in 2010 for buying and selling transactions. However, initially bitcoin is only used by online volunteers and enthusiasts. Organizations such as Amazon, PayPal, Tesla, Microsoft and Dell, the shining stars of today's financial world, recognize bitcoin and accept it as a means of payment (Dilek, 2018, p.17). As a result of his journey, which started with the purchase of a pizza, as a means of payment in the business world, BTC exchanges started to take place in the market.

By the end of 2017, a total of 1,963 ATMs in 61 countries around the world provide bitcoin services and more than 11,000 businesses use bitcoins in their transactions as a payment tool. The ratio of all bitcoin ATMs, which allow transactions with some other cryptocurrencies other than Bitcoin, is around 35%. The USA hosts approximately 60% of

bitcoin ATMs. There are 1,197 ATMs in the USA, 316 in Canada, 104 in the UK and 94 in Austria. While a very high rate of investment has been made in bitcoin ATMs as 96% in Europe and North America, this rate is around 2.4% in Asia (Dilek, 2018, p. 17-18).

Table 4 The increase of cryptocurrency ATMs

Date	**Number Of Countries**	**Number Of ATMs**	**Number Of Enterprises**	**Top 3 Countries**
December 2017	61	1963	>11.000	USA, Canada, Britain
February 2021	71	15451	275349	USA, Canada, Britain

Source: https://coinatmradar.com/, (15.02.2021).

2.3. The future of cryptocurrencies

In today's virtual world, everything is slowly going digital. Although it has not been a long time since crypto money emerged, it has shown that even with only a small amount of its potential, it will make great changes in the financial world. This road is a bumpy road, but when it first appeared it was more uncertain, now despite all the negativities, everyone agrees that cryptocurrency is inevitably the future itself. Governments want to quickly take a place in cryptocurrency and blockchain technology. They regulate the sector. It is thought that many more governments will regulate cryptocurrencies in the future. The discourses of international umbrella organizations are quite self-talked about this issue. The Hong Kong exchange has called for blockchain and cryptocurrency firms to be financially regulated. The UK government is currently discussing regulating cryptocurrencies. The issue that is especially discussed is whether cryptocurrencies are an opportunity or a risk for users, business and governments. Currently, while many countries regulate crypto money, some countries are considering using this technology and issuing their own cryptocurrencies. The US Treasury is conducting research studies on its own crypto currency. It is said that in 2030, 25% of all money in the world will be crypto money. Crypto currencies have very basic features that make us think that they will have such a bright future. The most important of these is the trust due to its decentralization (Uysal, 2019, p. 29-30).

In addition, the amount of electricity spent for crypto money mining at the beginning of 2018 reached a point where it would exceed the annual electricity consumption of some developed countries. Realizing this problem, new cryptocurrency programming teams have developed systems that can work without the need for a mining system. One of the earliest examples of this is a cryptocurrency-like electronic asset, which is Ripple and is considered to have a centralized operating system. As will be discussed in detail in the following years, at the design stage of the third generation cryptocurrencies, algorithms that eliminate the mining system structurally were developed and the decentralized structure of the system was maintained. When a general assessment of the future of crypto currencies is made in the light of information about the crypto money markets, it is concluded that no crypto currency, including third generation crypto currencies, in the crypto currency markets today does not have the characteristics of a currency in economic terms alone. He explained that what is more important than what the future of the Bitcoin system will be is that the technology working in the background of this system is in a strategic position for countries. He stated that with these technologies, a wide variety of applications can be developed in different fields (Çarkacıoğlu, 2016, p. 64-65).

Bitcoin, for example, is too volatile to be a store of value, too slow and costly to be a medium of exchange. While the third generation IOTA is fast enough and inexpensive to be a barter, it is still too volatile to be a value storage unit. However, the intergenerational evolution of cryptocurrencies is moving towards the creation of upper and lower tiers of cryptocurrencies. Since the crypto money, which is expected to be an important player in the future, is not considered as a valid payment instrument in current market conditions, its impact on the economy is limited (Tüfek, 2017, p.83). However, we can say that the adoption of cryptocurrencies for investors recently has enabled them to expand their usage area. Especially, corporate companies transform their assets into cryptocurrencies and recently large companies such as Tesla, the company owned by Elon Musk, started to sell goods and services with other cryptocurrencies that can be considered as bitcoin and its derivatives, and in addition, cryptocurrencies are included in the existing credit card system in terms of transaction speed such as mastercard. We can foresee that it will not take long for crypto currencies to enter our daily life in these days when we are in the process of adoption.

3. Conclusion

With the expansion of the electronic payment ecosystem, the use of electronic money is increasing day by day. Crypto currencies examined in this study are the last examples that can be given to electronic money. Cryptocurrencies have reached very high usage rates in recent years. Digital algorithms and services are at the heart of this system. The usability performance of Bitcoin, the first and most common example of crypto coins, after 2009 continues to increase today. Bitcoin has enabled individuals to perform transactions freely, flexibly and cost-effectively with the verification and mining performed with the devices of the users connected to the system, based on innovative algorithmic transactions, regardless of central banks or any institution.

Since crypto coins are not subject to a central authority, they are not affected by factors such as political interventions, wars and inflation that directly affect the current economic system. While the whole world was affected by the crisis in 2008, it is thought that these currencies, which emerged in 2009, will affect financial life and play an important role. The importance of Cryptocurrencies in banking crises in our nearby geography such as Greece and Southern Cyprus has been understood. Today, we cannot ignore that these systems are still very new and developing, although they are affected by the news flow in countries. Since these news feeds are related to Bitcoin itself, it causes fluctuations in pricing. China is discussing the Cryptocurrency ecosystem and many users join the system from China. This shows that this country is very active in Bitcoin and other crypto currencies. Today, crypto coins are used both as an investment and payment tool. This situation can be considered as an opportunity.

This currency, which is accepted by the society, has now started to be examined by the states. Although the USA is currently being monitored remotely, many studies are carried out on this subject. It is predicted that crypto money will be one of the most important building blocks of the financial system with the development and regulations to be made in the future.

As a result, the use of electronic payment systems and electronic money is increasing day by day. Today, electronic money still has its equivalent in reserve money. In the future, with the new systems, the use of cash will decrease and the payment system will turn into a completely digital economic infrastructure. For this reason, financial markets

should be adapted to the infrastructure in question and it should be ensured that they operate with a system that every segment can easily use.

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