

THE MINISTRY OF EDUCATION OF THE REPUBLIC OF AZERBAIJAN

AZERBAIJAN STATE UNIVERSITY OF ECONOMICS

INTERNATIONAL CENTER OF GRADUATE EDUCATION

MASTER DISSERTATION

on the topic

**“IS CRYPTOCURRENCY THE PERFECT HEDGE IN THE COVID-19
CRISIS”**

Guluzada Vafa Shamil

BAKU – 2022

**THE MINISTRY OF EDUCATION OF THE REPUBLIC OF AZERBAIJAN
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**Head of the International Center for
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CRISIS”**

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Elm andı

Mən, Quluzadə Vəfa Şamil qızı and içirəm ki, “Is cryptocurrency the perfect hedge in the Covid-19 crisis” mövzusunda magistr dissertasiyasını elmi əxlaq normalarına və istinad qaydalarına tam riayət etməklə və istifadə etdiyim bütün mənbələri ədəbiyyat siyahısında əks etdirməklə yazmışam.

“KRIPTOVALYUTA COVID-19 BÖHRANINDA MÜKƏMMƏL HEDCİNQDİR”

XÜLASƏ

Tədqiqatın aktualığı: Üzərində işlənmiş mövzu kriptovalyutaların xüsusiyyətlərini və dünyada ən məşhur olan kriptovalyutalardan bəhs edir. Həmçinin kriptovalyutalara olan kənar təsirlər göstərilmişdir. Belə ki, 2020-ci ildə bütün dünya ölkələri arasında geniş yayılan Covid-19 pandemiyası digər sahələrə təsir göstərdiyi kimi kriptovalyuta bazarında ciddi təsir göstərmişdir.

Tədqiqatın məqsədi: Mövzunun əsas məqsədi Covid-19 pandemiyası dövründə kriptovalyutaların hedging kimi müsbət və mənfi rolu araşdırılmışdır.

İstifadə olunmuş tədqiqat metodları: Tədqiqat işində təsviretmə üsulundan istifadə olunmuşdur. Xüsusilə təsviretmə üsulu toplanan məlumatlar əsasında rəy formalaşdırmasına kömək edəcək müşahidə formasıdır. SWOT analizdən istifadə etməklə Blokçeyn texnologiyası araşdırılmışdır.

Tədqiqatın informasiya bazası: Bu tədqiqatın metodologiyası monoqrafik, iqtisadi-statistik və hesablama-konstruktiv üsullar kimi ictimai və özəl elmi metodologiyalara əsaslanır.

Tədqiqatın məhdudiyyətləri: Qəfil bütün dünyanı öz cənginə alan bu pandemiyanın kriptovalyuta bazarında təsirləri geniş araşdırılmadığından kifayət qədər informasiya bazası yoxdur.

Tədqiqatın elmi yeniliyi və praktiki nəticələri: Aparılmış tədqiqatın nəticələri gələcək tədqiqatçılar üçün əhəmiyyətli olacaq, çünki onlar koronavirusun kriptovalyutaya təsirlərini müqayisə edə biləcəklər. 3 fəsildən ibarət olan disertasiyanın 1-ci fəsil 4 hissədən ibarətdir və ümumi olaraq kriptovalyutalardan və blokçeyn texnologiyasından bəhs edir. 2-ci fəsildə kriptovalyutaların hedging kimi xüsusiyyətləri, 3- cü fəsildə isə kriptovalyutaların maliyyə sisteminə müsbət və mənfi təsirləri araşdırılmışdır.

Nəticələrin istifadə oluna biləcəyi sahələr: Aparılmış tədqiqatın nəticələri bir çox sahələrdə, əsasən iqtisadiyyat və onunla bağlı sahələrdə istifadə oluna bilər. Eləcə də maliyyə sistemində kriptovalyutaların əvəzsiz rolunu nəzərə alaraq maliyyə sistemində də əks oluna bilər.

Açar sözlər: Kriptovalyuta, Covid-19 böhranı, Bitcoin, Ethereum, Blockchain texnologiyası

“IS CRYPTOCURRENCY THE PERFECT HEDGE IN THE COVID-19 CRISIS”

SUMMARY

The actuality of the subject: The topic is the characteristics of cryptocurrencies and the most popular cryptocurrencies in the world. There are also side effects on cryptocurrencies. Thus, the Covid-19 pandemic, which spread widely in the world in 2020, had a significant impact on the cryptocurrency market, as well as on other areas.

Purpose and tasks of the research: The main relevance of the topic is the positive and negative role of cryptocurrencies as hedging during the Covid-19 pandemic.

Used research methods: Descriptive method was used in the research. In particular, the descriptive method is a form of observation that will help to form an opinion based on the information collected. Blockchain technology was investigated using SWOT analysis.

The information base of the research: This study's methodology is based on public and private scientific methodologies, such as monographic, economic-statistical and computational-constructive methods.

Restrictions of research: There is not enough information base because the effects of this pandemic, which suddenly engulfed the whole world, have not been widely studied in the cryptocurrency market.

The novelty and practical results of investigation: The results of the study will be important for future researchers, as they will be able to compare the effects of coronavirus on cryptocurrency. Chapter 1 of the dissertation, which consists of 3 chapters, consists of 4 parts and generally deals with cryptocurrencies and blockchain technology. Chapter 2 examines the characteristics of cryptocurrencies such as hedging, and Chapter 3 examines the positive and negative effects of cryptocurrencies on the financial system.

Scientific-practical significance of results: The results of the this research can be used in many areas, especially in economics and related fields. It can also be reflected in the financial system, given the invaluable role of cryptocurrencies in the financial system.

Keywords: *Cryptocurrency, Covid-19 crisis, Bitcoin, Ethereum, Blockchain technology*

ABBREVIATIONS

ADA	Cardano
BTC	Bitcoin
BCH	Bitcoin Cash
BSV	Bitcoin SV
BNB	Binance Coin
ETH	Ethereum
LTC	Litecoin
USDT	Tether
XRP	Ripple
XLM	Stellar

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INTRODUCTION

Relevance of the research topic: In many ways, the year 2020 posed a great challenge to worldwide societies. People had to cope with changing restrictions such as quarantines, lockdowns of various locations, and working from home. The financial markets reflected these shifts as well. Stock markets around the world saw a substantial drop after the first worldwide lockdown began in March 2020. The value of the German stock index DAX, for example, fell by nearly 35 percent within few weeks in March 2020.

Cryptocurrencies are virtual or digital currencies that are safeguarded by encryption. The large portion of cryptocurrencies run on a peer-to-peer network. A peer-to-peer network, for example, in the case of Bitcoin, refers to a decentralized network based on blockchain technology that can make currency transfers. Bitcoin, altcoins, and stablecoins are the different kinds of cryptocurrencies. Bitcoin is the first cryptocurrency and is used as both a payment method and a store of value. Altcoins, on the other hand, cover a broader range of topics. They are non-Bitcoin cryptocurrencies with the wide ranges of features. Some of them operate on the same principles as Bitcoin, while others don't. Ethereum, for example, is a cryptocurrency that can be used to create decentralized applications and smart contracts. Stablecoins are altcoins, but they are a class of their own because, as their name implies, they are more stable and less volatile cryptocurrencies. The second chapter of this thesis delves more into the various implementations of cryptocurrencies and blockchain technology.

In the financial markets, cryptocurrencies are a relatively new asset class. Their tale begins in 2008, when Satoshi Nakamoto highlighted Bitcoin. Since then, the overall number of relevant cryptocurrencies has started to expand, as has their market valuation. Despite the fact that cryptocurrencies have only been around for a few years, the amount of literature on them has increased in recent years. The goal of this thesis is to draw consistent findings from existing research on the usage of cryptocurrencies in

hedging. The answers gleaned from the literature are diverse, and the answer must also be found through the thesis research. The following research questions are addressed in this thesis: RQ1: What hedging capabilities do a few of the most commonly traded cryptocurrencies have? RQ2: During the Covid-19 crisis, which cryptocurrency fared best as a hedging tool? The literature study of existing literature relating to the topic is used as a tool to identify the solutions. In addition, the thesis compares the hedging and safe haven qualities of cryptocurrencies (Bitcoin, Ethereum, and Tether), gold, and government bonds to the risks in the DAX and SP500 indexes' time-series evolution. The analysis was focused on the author's observations from January 2019 to December 2020. In the study of the research data, time series analyses of long-term development, as well as Dynamic Conditional Correlations - Generalized AutoRegressive Conditional Heteroscedasticity model between different variables, were implemented. During the turbulence, it was the only asset that was able to keep its DCC-GARCH rates low and its price consistent. The findings of Conlon, Corbet, and Mcgee (2020) support Tether's safe haven features. Long-term, Bitcoin and Ethereum were the greatest options for hedging against the DAX and SP500, since their considerable price increases during the examination period provided investors with reasonable returns. Furthermore, the research period's low DCC-GARCH rates strengthen the hedging features of the rates. Shahzad, Bouri, Roubaud and Kristoufek (2020) and others have come to similar conclusions on Bitcoin's hedging features. For example, because although the return on the German five-year government loan was negative during and after the period, the investor would have had to pay recurring expenditures. The analysis' findings will be discussed in detail in the next chapter.

Statement of the problem and learning level: Various local and foreign writers' scientific works reflect the process of examining the characteristics of the.

According to research, there have been several scientific publications, books, and periodicals produced on the topic. All of this makes research a lot easier.

The study is based on scholarly papers written by local and international specialists on the issue, official material released in local and international media, and information found on other government websites.

Purposes and objectives of the research: The purpose of this study is to broadly examine the impacts of COVID-19 on the cryptocurrency market by analyzing the effects of the pandemic on the global and local economies. The dissertation will study cryptocurrencies, understand how they worked and their effects before and during the pandemic.

Research methods: Various research methods will be used in the preparation of the research work.

One of them is the methods of description:

The method of description is a form of observation that will create conditions for the formation of an opinion on the topic based on the facts obtained from the articles. This method focuses not on solving the problem, but on defining it and forming an opinion. The analysis was carried out mainly using schemes.

In practice, SWOT (strengths, weaknesses, opportunities, threats) is one of the most effective evaluation methods. Using SWOT analysis, the strengths and weaknesses of blockchain technology will be explored, as well as the dangers that could hinder the future potential and development of the technology.

Research database: The methodological foundation of this study is grounded on general scientific and private scientific methods, including economic-statistical, monographic, and computational-constructive.

Research limitations: There is not enough information base because the effects of this pandemic, which suddenly engulfed the whole world, have not been widely studied in the cryptocurrency market.

Scientific novelty of the research: This dissertation is expected to answer important questions regarding the effects of the enduring COVID-19 pandemic on the

global and local economies, and separate areas of economy . The results of the research will be significant to future researchers, as they will be able to compare the impacts of coronavirus on cryptocurrency in different countries.

Scientific and practical significance of the results: This dissertation has three main chapters; The first chapter is common is about cryptocurrencies and blockchain technology and consists of four parts. The history of cryptocurrencies, the most popular coins in the world, the valuation of cryptocurrencies and the analysis of blockchain technology. In Chapter 2, the assessment of cryptocurrencies as hedging instruments during the financial crisis also discusses other cryptocurrencies. In Chapter 3 analyzes the negative and positive effects of cryptocurrencies on the financial system and the stability of the financial system of cryptocurrencies. The following chapters are Results & Discussion and Conclusion & Recommendations.

CHAPTER I. CRYPTOCURRENCIES AND BLOKCHAIN TECHNOLOGY

1.1. History and technical features of cryptocurrencies

Cryptocurrencies, or virtual currencies, have been employed in payment systems in recent years. They are rapidly extending their coverage area, and these currencies are employed in financial markets all around the world. Investors will be drawn to you if you are able to grab their attention. Cryptocurrencies, creative technology, high security structures, use as an investment instrument, computer programmers, and entrepreneurship are all examples of cryptocurrency. They are confronted with the desire of their capital and investors to invest in them. However, you should be aware that cryptocurrency can be utilized by smugglers and other illicit individuals and criminals. Cryptocurrencies fall into several groups in the economic hierarchy. In the views of stakeholders, a game-changing technology is regarded as both promising and frightening. In essence, cryptocurrencies are an innovative and efficient payment method that offers a variety of possible benefits, as well as potential threats to investors, consumers, and businesses, financial institutions, and even national security. are the originators The future of currencies continues to be the driving cause behind these markets' tremendous volatility. For most market players, this makes cryptocurrencies unpredictable and perplexing. Researchers have increased their interest in this issue in attempt to answer the enigma of the complicated world that continues to be perplexing. Cryptocurrencies are digital currencies that are built on a technology known as "blockchain." Today, there are over 500 virtual currencies, including Bitcoin, Ethereum, Ripple, and Litecoin. Cryptocurrencies are a subset of alternative currencies, while digital currencies are a subset of digital currencies. Cryptocurrencies are slowly but steadily becoming a new form of payment all around the world began to be used as

a method. With the absence of middlemen, blockchain technology allows third parties to cut transaction costs. This is a payment system innovation. It provides a fantastic opportunity for bringing people together. The removal of borders has been permitted by technological advancements and developments, and as a result of this circumstance, payment methods based on electronic platforms have emerged. Cryptocurrencies are essentially the result of these advancements, and technical advancements are an excellent example of how advances can affect financial systems.

Cryptocurrencies are the physical currencies we use in the real world, the Turkish Lira, the Dollar, the Euro, Sterling Yen, and other monetary systems. Cryptocurrency is a new addition to the money market, and expressing an unequivocal judgment on it is difficult. Of course, everyone will be interested in its benefits, drawbacks, and possibilities. The preference for virtual compensation for people who give, in particular. Cryptocurrency is a phenomenon in 2010. He might be called one of the marvels of innovation in the financial industry because he is electronic. It comes into our lives unexpectedly, and it's fascinating to see how it may revitalize our lives to make them even better. The world has become increasingly serious in recent years. A financial crisis occurred. The crisis, which is still unfolding, has caused a crippling blow to the economy of the countries affected. The US has lost 1.5 trillion dollars as a result of the crisis. National currencies experience such events. At that time, digital currency (cryptocurrency) was created as one of the technologies for electronic payment. Any country's money will not be called cryptocurrency. This is in the process of forming digital, virtual currency flaws (high level of risk, cyber attack potential, participants usability, and so on.) sufficiently There are benefits. Inflation is unaffected by any state policy, regulations, or currency that is not regulated by any state and occurs in national currencies. All of this adds to the appeal of cryptocurrencies. Mining is the method of obtaining cryptocurrencies.

Since the word currency is employed, this time comes from cryptography.

At the start, the crypto prefix is utilized. In English, each cryptocurrency unit is referred to as a Coin. Only a restricted amount of coins can be issued in advance depending on a set algorithm. Each coin has encrypted information that is safe from any kind of fabrication. It signifies falsification, and perhaps the impossibility adds to its allure.

Its excellence as an electronic payment method serves as a barometer. Bitcoin was the first to emerge. The term "cryptocurrency" is still widely used today. The original version of the wallet was Bitcoin. On January 9, 2009, the film was released. Since 2012, the Bitcoin Foundation has controlled a firm in the United States named.

Its goal is to protect the security of monetary transactions and to keep track of fresh coin generation. Bitcoin was the first cryptocurrency, discovered in 2008. Hundreds of other cryptocurrencies are now in use, and they are frequently referred to as alternatives. Altcoins are a type of cryptocurrency.

Cryptocurrency is analogous to an electric current that is turned into monetary-valued lines of code. This is a number with a mathematical value. Simply explained, bitcoin is a form of electronic money. Unlike central banks, which establish the value of a currency, cryptocurrencies are not controlled by any government. Because there is no central authority in charge of this money.

Many cryptocurrencies (Bitcoin, Ethereum, Litecoin, IOTA, Ripple, and others) are created with the intention of producing fewer units over time and so creating market value. This is not the case with the currencies used by states. As a result of state economies' ability to produce more money whenever they choose under advantageous conditions, inflation rises. The Bitcoin market, for example, will never reach 21 million units. Despite the fact that there are hundreds of different types of cryptocurrencies, the most of them are based on one of two protocols: POW or PoS. Cryptocurrency miners, who have set up computers or ASIC machines to verify and process foreign exchange transactions, hold all cryptocurrencies.

Being a form of virtual currency that is created and controlled via cryptographic technologies. The accounting for Bitcoin is done in a decentralized manner, and its use is governed by a limitation system. The information regarding the transactions are usually not encrypted and can be made public. The databases of the line of operations' stability is ensured by a cryptographic element.

The legal and economic position of bitcoin at the moment. The essence of the matter is being debated. Depending on the country, Bitcoins, which are a form of payment, are regarded a unique product, with circulation restrictions. The following are some of the methods used to create bitcoins: mining. Bitcoin's popularity is growing by the day, but even the most common digital account subunits in large banks are just one step removed from being used. As a result, various impossibility of management impediments exist in the Nations and cash flows moving across the world for Europe. The Central bank announcement, in particular, is crucial to bitcoin's growing popularity. Inflation is out of control for the central bank. This concept is also supported by other financial institutions.

History of cryptocurrency:

Bitcoin was the first cryptocurrency, created in 2008 by a mysterious software developer known only as Satoshi Nakamoto. POW is one of the system used by Bitcoin.

After Bitcoin, Namecoin was launched in April 2011 with the goal of making internet censorship easier through decentralized DNS. Litecoin, the first successful cryptocurrency, was launched in October 2011 with Scrypt encryption rather than SHA-256. People can create Litecoins without special equipment, such as ASIC processors used for Bitcoin mining, thanks to this functionality.

In late 2013, Litecoin was recognized by the media and reached a market value of \$ 1 billion. Founded in 2011, Ripple is based on the same protocols as Bitcoin.

Cryptocurrency Security

The security of cryptocurrencies consists of two parts: 1. Finding dense hash intersections, the work done by miners; second, and more likely, a miner with more than 51% of the network's mining power can change the global blockchain system and create an alternative book called 51% Attack. Even at this point, what the attacker can do is limited. It may cancel its cash transactions or block other cash transactions.

Cryptocurrencies are also unlikely to be seized by the government. All Cryptocurrencies are anonymous. Some departments have created new systems to ensure complete anonymity.

Hash in cryptocurrency

Cryptocurrency mining power is measured in hash per second. A device with 1kH / s digs 1000 hash per second. 1 MH / s means one million hash per second, 1 GH / s means one billion hash per second. When the miners successfully solve the block, a new hash is created.

The hash algorithm converts this large amount of data into a fixed length hash. If you are familiar with the code and know the algorithm, you can analyze this hash and extract the information inside. But in the eyes of the average person, these hashes look like compressed numbers, and it is almost impossible to decipher them.

Cryptocurrency is a digital online cashing system that works without third party confirmation. Due to the shortage of third parties, it is possible to conduct financial transactions directly between users without going through a public financial institution. In 2008, an anonymous group of authors named Satoshi Nakamoto marked the beginning of cryptocurrencies when they published another option for monetary transactions by publishing an article about Bitcoin as a peer-topped payment solution. Bitcoin was developed to meet the demand for systems that allow online monetary transactions between parties without the confirmation of a third party (Nakamoto, 2008). In traditional monetary transactions, one party sends money or an equivalent product to another and a third party confirms this. With Bitcoin, system transactions are validated

by other users (Nakamoto, 2008). Moreover, in most cases, the value of traditional monetary assets is based on the value of other assets, but in cryptocurrencies, that value is based on the security of algorithms that can track all transactions. There are other references to cryptocurrency value formation, but these are described in Section 2.2. After Bitcoin was released, about 4500 other cryptocurrencies (investing.com, 2021a) were released on the cryptocurrency market, and the number of currencies released has increased over time. These later released cryptocurrencies are known as altcoin because they are alternative cryptocurrencies to Bitcoin. In addition, the methods of investing in cryptocurrencies have evolved over time. Initially, investors could only buy, hold or mine cryptocurrencies. For example, today you have the option to buy Bitcoin futures. A feature common to all cryptocurrencies is that they all use blockchain technology. A blockchain is a chain of individual parts. Each part contains updated information, and the latest block contains the latest information. Blockchain technology acts as a distributed database or as a public ledger where all information about the digital transactions in which a transaction was executed is exchanged between the parties. For example, in the Bitcoin blockchain, a block contains information about the amount of Bitcoin tokens sent, a time stamp, and who sent the tokens to whom. However, the behavior of Bitcoin and Altcoin is different. For example, there are differences in features such as transaction speed, distribution method, and hash algorithm. An example of the blockchain technology used is a Bitcoin transaction system that simply works as follows: In a transaction, Party A sends a certain amount of Bitcoin to Party B, and the transaction is validated by other Bitcoin users (Nakamoto, 2008). Overall, Bitcoin networks are more complex. Bitcoin network users have Bitcoin tokens purchased from the Bitcoin Marketplace or obtained from Bitcoin Mining. An important difference from fiat money is that Bitcoin network users do not own a certain number of tokens in their wallet, only information about the last transaction executed. This proves that there is a transaction that has received a certain number of tokens. As new tokens from Bitcoin Mining are released for the Bitcoin network, the number of

tokens available on the Bitcoin network will increase over time. In Bitcoin mining, users of the network validate transactions and try to solve numerical puzzles. As a reward for solving puzzles and validating transactions, these miners receive a certain amount of Bitcoin tokens as income. The number of tokens received decreases over time. The last Bitcoin token is estimated to be added to the system via Bitcoin mining by 2140. Due to the decrease in reward tokens from Bitcoin mining, transaction fees for the Bitcoin network have increased. Without an increase in transaction fees, the Bitcoin network will not work. Without mining rewards, it would not be beneficial for miners to continue to validate transactions, and without miners, transactions would not be possible.

1.2. The most popular coins

Bitcoin is not only a trendsetter that creates a wave of cryptocurrencies based on a decentralized peer-to-peer network, but it has also become the de facto standard for cryptocurrencies, inspiring an ever-growing army of followers and affiliates.

As of February 7, 2020, there are 2396 cryptocurrencies available for trading, with a total market size of \$278 billion (<https://coinmarketcap.com/>) highest market cap on the Table lists the ten most valuable cryptocurrencies.

Table 1: The ten most valuable cryptocurrencies

Cryptocurrency	Symbol	Market value (\$)	Quantity in circulation	Market share
Bitcoin	BTC	178.056.399.605	18.204.600	%64.03
Ethereum	ETH	23.984.565.049	109.600.190	%8.62
Ripple	XRP	12.230.583.461	43.698.224.662	%4.39
Bitcoin Cash	BCH	7.933.716.371	18.265.438	%2.85
Bitcoin SV	BSV	5.320.644.952	18.262.640	%1.91

Litecoin	LTC	4.704.661.450	64.029.835	% 1.69
Tether USDT	USDT	4.655.135.990	4.642.367.414	% 1.67
EOS	EOS	4.322.216.262	951.977.462	% 1.55
Binance Coin	BNB	3.388.475.630	155.536.713	% 1.21
Cardano	ADA	1.565.827.482	25.927.070.538	% 0.56

Source: <https://coinmarketcap.com/>

The extreme volatility of cryptocurrencies makes it difficult for investors to establish strategies and adopt the proper position and invest. Investing in the crypto money markets entails a significant level of risk. Operational and security-related (cyber risk) threats are the most significant of these dangers. Cryptocurrencies, on the other hand, continue to pique the interest of investors today.

It is clear that he believes the stories and suspicions that are circulating.

In the literature, Bitcoin and other cryptocurrencies are regarded as "speculative" assets. According to certain studies, it is required. First, there's the price of Bitcoin. Bitcoin has been proved to be extremely speculative, according to research. With the recent expansion of cryptocurrency markets, some say that money can now be considered a new form of investment tool. Cryptocurrencies are viewed as a new type of investment or alternative asset.

However, there are two points to consider for investors. Furthermore, the first of them, particular investing dangers, and the second, the interactions of cryptocurrencies with other assets. The benefits of cryptocurrency diversity and hedging capabilities are the most crucial. Taking digital assets out of investing options will be just as restricted as taking all assets out. Because cryptocurrencies can be converted into fiat currency, they can be incorporated in any portfolio. Another asset class has emerged, despite the lack of a clear legal definition.

10 MORE IMPORTANT CRYPTO COINS EXCEPT BITCOIN

Although Bitcoin is the most popular cryptocurrency in the world, analysts utilize a variety of alternative methods to value tokens. For example, analysts typically attach great importance to the relative ranking of coins in terms of market value. I've added it to my account, but there are other reasons why I don't add the digital icon to the list.

1. Ethereum (ETH)

Ethereum is the first Bitcoin alternative on the list and is a decentralized application that allows you to create and launch smart contracts and decentralized applications (DApps) without interruption, fraud, control, or third-party intervention. This feature makes results difficult for individuals in some countries, as individuals without government infrastructure and government IDs have access to bank accounts, loans, insurance, or a variety of financial products. The Ethereum application works with Ethereum, a platform-specific cryptographic token. Ethereum is like a navigation tool on the Ethereum platform and is primarily in demand from developers who want to develop and operate applications within Ethereum, or investors who want to buy other digital currencies through Ethereum. Launched in 2015, in market value after Bitcoin, but is far behind the dominant cryptocurrency. As of January 2021, the market value of Ether is about 19% of Bitcoin. Ethereum started pre-sale of Ethereum in 2014, and it was a big hit. This marked the beginning of the Initial Coin Supply (ICO) era. As of January 2021, Ethereum (ETH) had a market value of \$ 138.3 billion and a token value of \$ 121.8559. In 2021, Ethereum plans to switch the consensus algorithm from worksafe to proof of stack. This move allows the Ethereum network to manage itself with less power and improved operating speed. This process secures the network and handles the transactions that occur. Those who do this will be interested and rewarded.

2. Litecoin (LTC)

Litecoin was launched in 2011 and is one of the cryptocurrencies to follow in the footsteps of Bitcoin, sometimes referred to as "Bitcoin Silver for Gold". "It was

designed by Charlie Lee, an MIT graduate and former Google developer." Litecoin is based on an open source worldwide payment network that is not centralized and employs Script as a proof of work that can be decoded on consumer CPUs. Litecoin is similar to Bitcoin in many ways, but has a faster blocking rate, which makes transaction validation faster. In addition to developers, the number of traders accepting Litecoin is increasing. In January 2021, Litecoin became the sixth largest cryptocurrency in the world with a market value of \$ 101 billion and a token value of \$ 153.88.

3. Cardano (ADA)

Cardano is Ouroboros' proof-of-stack cryptocurrency developed by engineers and cryptographers using a research-based approach. The project was founded by Charles Hoskinson, one of the first five founding members of Ethereum. Ethereum split after some disagreements about where to go and later helped find Cardano. The team behind Cardano built the blockchain through extensive experimentation and research. The researchers behind the project have written over 90 articles on various topics related to blockchain technology. This study is the basis of Cardano. Thanks to this rigorous process, Cardano differs from its competitors in pricing among other major cryptocurrencies. Cardano also earned the nickname "Ethereum Killer" because it was said that blockchain could do more. But Cardano is still in its infancy. Ethereum has defeated the consensus-based model, but it still has a long way to go when it comes to decentralized financial applications. Cardano aims to become a global financial operating system by developing decentralized financial products like Ethereum that provide solutions for chain interaction, fraudulent voting, and legitimate contract tracking. increase. As of January 2021, Cardano has a market value of \$ 9.8 billion and ADA transactions of \$ 0.31.

4. Polkadot (DOT)

Polkadot is a uniquely certified cryptocurrency developed to ensure interoperability between other blockchains. The protocol was developed to connect

exchanges with licensed and unauthorized blockchains so that systems can work together under one roof. The main component of the Polka Dot is a relay chain that allows variable networks to work together. It also allows "parachains" or parallel blockchains that have their own local tokens for a particular application. The difference between this system and Ethereum is that instead of simply building a decentralized application with Polkadot, developers can create their own blockchain using the security already available with Polkadot Chain. Ethereum allows developers to create new blockchains, but the larger the blockchain, the more secure it is, so you need to create your own security measures that can attack new small projects. At Polka Dots, this concept is commonly referred to as security. Polkadot was designed by Gavin Wood, another of the Ethereum project's core creators. Gavin Wood has opposing viewpoints on the project's future. Polka Dots has a market value of \$11.2 billion and DOT transactions of \$12.54 as of January 2021.

5. Bitcoin Cash (BCH)

Bitcoin Cash (BCH) occupies a prominent place in altcoin history being one of the first and most successful hard forks of the original Bitcoin. In the world of cryptocurrencies, divergence occurs as a result of debate and debate between developers and miners. Since digital currencies are decentralized, major changes to the base code of received tokens or coins must be made by mutual agreement. The mechanism of this operation depends on each cryptocurrency. If different groups disagree, the digital currency may be split, the original chain will remain the original code, and the new chain will begin to function as a new version of the coin before the code was changed. BCH became operational through one of these divisions in August 2017. The controversy that led to the creation of BCH related to size issues. The Bitcoin network has a block size limit: 1 megabyte (MB). BCH doubles the block size from 1 to 8 megabytes. The idea is that larger blocks can hold more operations, which speeds up operations. We will also make other changes, such as removing the preventive

witness protocol affecting the blockchain realm. As of January 2021, BCH has a market value of \$ 8.9 billion and \$ 513.45 per token.

6. Stellar (XLM)

Mass transactions between banks and investment companies usually take days and cost a lot between multiple brokers, but they can now be done almost immediately and cheaper without an intermediary. rice field. Because even though Stellar has evolved into an enterprise blockchain for commercial ventures, it remains a public blockchain that anybody can utilize. The system enables cross-border transactions between any currency. The local currency of Stellar is Lumens (XLM). Jed McCaleb, a founding member of Ripple Labs and the innovator of the Ripple protocol, implemented Stellar." He eventually resigned from his role at Ripple and continued to establish the Star Development Foundation. Stellar Lumens has a market capitalization of \$ 6.1 billion and is estimated to be \$ 0.27 as of January 2021.

7. Chainlinks

Chainlinks, like Ethereum, are decentralized Oracle networks that bridge the gap between smart contracts and their external data. The blockchain cannot securely connect to external applications. Chainlink's decentralized tools allow smart contracts to communicate with external data so that Ethereum can execute contracts based on data that it cannot connect to. The Chainlink blog has more information on the various uses of the system. One of the many uses described is to manage pollution or illegal syphilis water sources in certain cities. Sensors can be installed to monitor operational consumption, water levels, and local water. Chainlink Oracle can track this information and send it directly to smart contracts. You can create smart contracts to fine, send flood alerts to cities, and calculate data from Oracle, a city-intensive company. The Chainlink was developed by Sergei Nazarov and Steve Ellis. As of January 2021, Chainlink has a market value of \$ 8.6 billion and LINK is \$ 21.53.

8. Binance Coin (BNB)

Binance Coin, Binance is a convenient cryptocurrency that acts as a payment method for transaction-related payments on exchanges. Those who use tokens as a payment method for exchanges can get discounted transactions. Binance Coin's blockchain is also the platform on which Binance's decentralized exchanges operate. Founded by Changpeng Zhao, Binance Exchange is one of the most widely used exchanges in the world in terms of trading volume. The Binance Coin was originally an ERC20 token running on the Ethereum blockchain. At last he started a home network. The network uses the Proof of Stake consensus model. As of January 2021, Binance has a market capitalization of \$ 6.8 billion and BNB has a market capitalization of \$ 44.26.

9. Tether (USDT)

The Tether is one of the earliest and most popular cryptocurrencies, a pseudo-stable coin aimed at allocating market value to currencies or other external reference points to reduce volatility. Is a group of. Tethers and other stablecoins are price fluctuations to attract more cautious users, as most digital currencies, even major currencies like Bitcoin, often experience periods of dramatic fluctuations. Try to offset. The price of tether is directly related to the price of US dollars. This system allows users to transfer US dollars from other cryptocurrencies faster than they can actually convert to regular currencies. Launched in 2014, the Tether claims to be "a blockchain platform that is supposed to promote the digital use of fiat currencies." In effect, this cryptocurrency allows individuals to minimize the variability and complexity associated with digital currencies by performing transactions in traditional currencies, typically using blockchain networks and related technologies. I can do it. As of January 2021, Tether was the third largest cryptocurrency by market value, with a total market value of \$ 24.4 billion and a token limit of \$ 1.00.

10. Monero (XMR)

Monero is a secure cryptocurrency with no tracking. This open source coin was first introduced in April 2014 and quickly garnered popularity among crypto

enthusiasts. The development of this cryptocurrency is fully funded and socially driven. Launched with a focus on decentralization and scalability, Monero uses a special technique called "ring signature" to provide complete privacy. This technique recognizes a group of cryptographic signatures that contains at least one real participant, but the real participants cannot be separated because they all appear to be valid. Thanks to these extraordinary security mechanisms, Monero has developed one of the infamous criminal activities around the world. While this is a prime candidate for anonymous crime, Monero's privacy also helps opponents of oppressive regimes around the world. Monero seems to have a market value of \$ 2.8 billion and tokens worth \$ 158.37 during January 2021.

1.3. Valuation of cryptocurrencies

Since 2017, the cryptocurrency market has grown at a breakneck pace. The topic of whether market pricing changes are justified has been raised.

The primary valuation frameworks created for use with cryptocurrencies will be covered in this article. "The models established and utilized to measure the worth of crypto assets are a valuable method to think about and analyze the current condition of those assets, but they are not without flaws." but they should not be used to justify investment because the crypto market is subject to high volatility, infrastructure changes in the underlying blockchain technology, and, last but not least, political and regulatory risk factors.

Fundamental analysis, which uses financial statements to examine publicly listed companies, is used to make equity investments. We can't use information like that in the case of cryptocurrency because there isn't any. As a result, we must either modify our valuation perspective to a cost perspective or employ relative valuation methodologies, which will be discussed in the next chapters. The value of crypto assets

is derived through community engagement rather than the generation of financial flows (miners secure the network and users execute transactions). Furthermore, cryptocurrencies are deficient in real-world applications. Bitcoin is, without a doubt, utilized for online payments in some stores, and Ethereum is the major technical asset in the case of Initial Coin Offerings (ICO), whereas Ripple has had a significant impact in Japan, with banks developing a payment platform based on its technology, but the long-term implications must still be assessed.

The method begins with a brief introduction to the definition of cryptocurrencies, followed by a quantitative assessment of the total market, which is very dynamic, with the most rapid growth in 2017 with the creation of a new cryptoecosystem that began in 2009 with Bitcoin.

Bitcoin Mining

The majority of people acquire Bitcoins by purchasing them from a cryptocurrency exchange. People can also obtain Bitcoins by mining them.

Central banks govern money growth in the conventional fiat currency system by simply printing it. Non-physical monetary values are not affected by this operation.

The fundamental to a well-functioning blockchain network is that everyone on the network must agree on the contents of the ledger. The Proof-of-Work (PoW) consensus mechanism was the first to be designed for the Bitcoin network. Bitcoin transactions are collected in a block (a list of transaction data) that must be validated within a specific duration. Miners are compensated in Bitcoin for supplying processing power that allows the block to be added to the existing blockchain. Miners play a critical part in ensuring the database's security. The information in the block is converted to a series of letters and numbers throughout the mining process (Hash). As a security feature, each block contains the hash of the previous block. If someone tried to modify the block to manipulate a transaction, the hash would change as well. The following block's reference would therefore be false, requiring the hacker to mine every other

block after the altered one, which would take an enormous amount of computational power, as an invader requires a multiple of the existing power.

Miners are paid 12,5 BTC every block for the security protections their services provide.

Quantitative Analysis of Crypto Asset Market

Since early 2015, the entire market capitalization of cryptocurrencies has surged by more than 54 times, reaching almost \$300 billion in June 2018, with 20 cryptocurrencies having a market capitalization of more than \$1 billion. Since cryptocurrencies gained widespread public attention and a big price increase in 2017, a slew of new currencies have arisen. New consensus mechanisms (such as proof-of-stake) and smart contract systems (such as the Ethereum blockchain) enable non-monetary use cases to be realized (e.g. ICOs).

As more cryptocurrencies were launched, the historical distribution of market shares changed dramatically. Bitcoin, which lost the most, was replaced by Ether (ETH), the native currency of the Ethereum network. Despite this, Bitcoin is still the most valuable cryptocurrencies in terms of market capitalizations.

Table 2: Market Share of Bitcoin and Ethereum

Bitcoin (BTC)	Ethereum (ETH)	OTHERS	Date
93.67%	0%	6.33%	14 July
83.20%	0%	16.80%	15 July
83.46%	7.50%	9.04%	16 July
41.92%	26.23%	31.85%	17 July
38.15%	17.71%	44.14%	18 July

Source: Author's survey results

As of June 2018, the top five cryptocurrencies, Bitcoin, Ethereum, Ripple, Bitcoin Cash, and EOS, accounted for 76.66 percent of total market capitalization (77,41 percent in June 2017). In comparison to 2017, the absolute share did not change considerably, but the shares among the currencies had a very tumultuous year. Since 2017, EOS investors have received about 8 times the return that Bitcoin investors have received. Notably, Bitcoin has the lowest volatility in our study group, whereas EOS has the highest value for the past year.

Table 3: Financial Metrics for the largest cryptocurrencies

Currency	8th June 2017 to 7th June 2018			
	<i>Change in price</i>	<i>Avg daily return</i>	<i>15-day Vol</i>	<i>30-Day Vol</i>
BTC	173,67%	0,28%	35,46%	49,28%
ETH	131,28%	0,23%	81,47%	84,35%
XRP	134,10%	0,24%	75,53%	86,31%
BCH	176,90%	0,32%	105,91%	115,16%
EOS	1344,55%	0,78%	132,20%	134,81%

Source: Author's survey results

Valuation of Crypto Assets

In the case of cryptocurrencies, intrinsic value is difficult to quantify. As a result, standard valuation methods for assets such as equities (cashflow/ earnings generating assets) must be modified. However, we may create numerous models based on the characteristics of cryptocurrencies and utilize a consensus average value as the valuation outcome, which we call the fair value. High volatility makes it difficult to use models like the moving average approach, which has a number of flaws when it comes to predicting future values in turbulent situations.

Net Cost Model

The Net Cost Model (NCM) of cryptocurrency valuation is built on the presumption that a person can either

- 1) mine bitcoin in return for a given number of units or
- 2) buy bitcoin using a defined number of units or

3) buy bitcoin on a cryptocurrency exchange. The intention is to calculate the difference in value between the mining operation and an exchange purchase. To compute the volume of cash-outflow over the full period, we'll need to figure out the components of an exemplary mining process. The hardware costs as well as the electricity costs to run the hardware are also included in the mining costs. We utilize the Bitmain Antminer S9i (1.310W; 14.000 GH/s) as exemplary hardware in this model, and we assess electricity costs at €0,29 kWh (Germany average). At the current mining difficulty of 0.155 BTC/Year, acquiring one Bitcoin should take roughly 6,42 years. Mining difficulty is steadily increasing (90 Day Difficulty Change = 50%), predicting that mining costs will rise in the next years.

For the first year, the total cost is €4.966,28. We presume that the mining hardware will not be sold after the time period in which it is in use, and that depreciation will have no effect on its performance. Following these principles, costs are only strongly linked with electricity usage and price fluctuations in the energy market after the first year (Hedging instruments to stabilize energy prices will not be considered in this paper). Regardless of the number of miners, one block is mined every 10 minutes. The cryptographic puzzle becomes more difficult as the number of miners grows, and it becomes easier as the number drops. For the purposes of this calculation, we assumed that the number of miners remains constant.

The net cash outflow must be discounted at an appropriate rate. To assess the beta value of Bitcoin, we developed a simple regression model based on the DAX and BTC closing values. We calculated a total CAPM cost of capital of 56,76 percent using

the regression model (Beta of 4,34), the current 10Y bond rate (0,445 percent), and the 4Y average DAX return.

When we use our discount rate to discount the numbers, we get a present value of €8.474,06 for the future cash outflow from the standpoint of a Bitcoin miner. In order to match the cost structure of a miner, the value of a Bitcoin should rise by €2.711,72 (+47,6%). In today's market, it would be more advantageous to just buy Bitcoin on an exchange like Coinbase rather than mine them, which is relatively expensive.

By 26.05.2020 mining rewards (currently 12,5 BTC each block) will be halved. This means that a single miner's reward production should be reduced by 50%. This would have an impact on our calculations because we'd have to double the time it takes to mine one BTC. To the valuation figure, at least 6 additional years of power expenses must be included, resulting in a new value of 8.710,48 €.

Network Value to Transaction Model

In the case of Bitcoin, discounted cashflow methodologies are not applicable. To account for the nature of cryptocurrencies, further absolute value principles must be applied.

As a result, using a relative value metric is a useful way to at least locate cryptocurrencies with a low price level. In an inflated system, an overvalued currency can be an undervalued asset at the moment. Which statistic will we use to replace profits in the P/E Ratio is the question. The demand and utility of a cryptocurrency are represented by transaction activity (utility of bitcoin is the possibility of moving digital money).

From the perspective of an investor, we want to see a higher-than-average volume of transactions for the currency. As a result, we utilize the so-called "network value-to-transaction ratio" (NVT) to determine if crypto assets are undervalued or overvalued. The network value is calculated by multiplying the price of an asset by its circulating supply and dividing it by the last 24 hour's USD transaction volume. The

NVT value for Ripple (XRP) has the highest value and volatility, whereas Bitcoin has the most stable development, as shown in the graph below.

1.4. SWOT analysis of Blockchain Technology

Blockchain, as you may be aware, is a distributed ledger technology.

Working with technology is a complicated procedure. Cash processes that are carried out through the bank in the wealth management industry. Every transaction is recorded here, and it is evident that he is no longer present. Banks support international trade and convert currencies amongst each other. Money and transactions are both digital in Bitcoin. Each transaction is encrypted and communicated using cryptography. I'm referring to the fact that when users send bitcoin to one other, both the transmitter and the recipient view a long encrypted code made up of letters and numbers. The system recognizes the code as currency and accepts it. Every passcode in the program is one-of-a-kind and cannot be duplicated. It is hard to cut counterfeit money, and money 2 would not spend time.

The lack of is the most significant element for the banking institution behind bitcoin. There is no bank, but there is a printing center. Only the blockchain knows how much bitcoin is in circulation. The number of bitcoins available is restricted. This will help stop inflation from occurring because there can only be deflation, which means money can only increase in value over time.

Digitalization is unavoidable in all of the aforementioned processes.

The highest-ranking topic is blockchain. The question over whether or not to apply, and when to apply, is already being debated in circles.

Below are the features of Blockchain as well as the current and potential impacts of the external environment. The analysis also shows that the favorable internal factors

represent the existing features of Blockchain technology. This view shows the current state of development of Blockchain technology. Stimulants consist of some external activities that have a positive effect on the perception of technology.

We've become acclimated to sharing information via the Internet's decentralized platform. When it comes to moving value (money), however, we are frequently forced to employ the services of businesses since we have re-centralized old finance (banks). Internet payment systems (such as PayPal) almost always need connection with a credit card or bank account; otherwise, their use is difficult. Another purpose is the formation of trustworthy relationships as well as the personality's genuineness. Because the identification function cannot be changed, no one can modify the block sequence without matching keys. Changes that do not pass muster with these keys will be rejected. Although keys can theoretically be stolen, protecting multiple computer codes generally does not require a significant financial investment. This means that banks' main functions are blocks, which are executed more flexibly and precisely in order.

You can get rid of these "middle ground" offers thanks to blockchain technology. This technology is well-known in the financial services industry for registering agreements, verifying identities, and assuming three obligations, such as finalizing contracts. Because this is a very important technology. The financial services industry is the largest market capitalisation.

At least a portion of this system's transition to blockchain technology, which will affect a huge number of financial services, will result in the collapse of relationships, but such services will also boost efficiency.

The use of digital blockchain technology in finance is a significant step forward. This "silent revolution" isn't going to happen overnight. This will most likely be a gradual process. Organizations involved in banking This is so that they can use the blockchain because of their own purposes and investigate the technological potential.

The policy in the supply chain of agricultural products has more general and broad ideas that can be implemented in Blockchain. Thus, digitalization and automation

have a positive impact on the adoption of Blockchain. Weaknesses are the existing shortcomings of blockchain technology. The deterrent group consists of speculative investor behavior and the bad reputation of crypto cybercriminals. Today, it is very important to recognize the government regulation by COVID 19 and its impact on the world economy. Future internal opportunities include the potential positive development of blockchain-based technologies and business models. The customer experience of new blockchain applications can lay the communication and interactive foundation for creating more efficient applications for new business models. External future opportunities are based on economic and social digitization. Potential internal threats arise from the potential for lack of security (in the case of urgent quantum computing) and general uncertainty about future types of research. External threats include negative economic trends, government regulation, and the ability to bring new intermediates to the supply chain.

Strength

1. Transparency.
2. Traceability.
3. Do not need the intermediary.
4. Cheap entry to systems.
5. Anonymity.
6. Security.
7. Robustness.
8. Trust
9. Open Source

Weakness

1. Storage space.
2. High variable costs.
3. Fork problem.

4. Many application and standards.
5. Low processing speed.
6. Scalability

Internal opportunities

1. Technology maturity
2. Support of emerging new business models
3. Improve business process efficiency
4. Trust in more trustless networks
5. Customer experience

External opportunities

1. Changing in global monetary systems (adoption)
2. Government regulation
3. Automation
4. Customer experience
5. Increase the digitalization part of human live

Internal threats

1. The lack of security (quantum computing)
2. Uncertainly of the future research (inside)

External threats

1. Uncertainly of future research (outside)
2. Government regulation
3. Cybercriminal
4. New intermediates
5. Strengthening the regulation of economics.

A foundation for scientific studies The current study's methodological approach is built on a systematic investigation of Blockchain technology, which is appraised

through a fundamental context analysis. Based on analytical-synthetic techniques, conclusions are formed from a review of relevant professional sources. The agribusiness analysis was based on a review of existing data from the FADN CZ database and the Eurostat database. The findings from these assessments were employed in an expanded SWOT-analysis (SWOT stands for strengths, weaknesses, opportunities, and threats and is a structured planning tool). An intensification of standard SWOT analysis, proposed, concerns a time dimension.

As a result, the traditional four-field SWOT matrix has been transformed into an eight-field matrix. The new method takes into account new criteria such as the occurrence in time (current or potential), the source of origin (from inside the system or from the outside), and the form of influence (favourable or unfavourable). The following are the new characteristics:

- "Strengths – most crucially, the features of the system that exist at the time of analysis: active or inactive, but it is possible to be activated."
- Weaknesses – most significantly, system properties that are brakes or hurdles to its development at the time of analysis.
- Internal opportunities — high-potential, tried-and-true opportunities arising from the company's internal structure.
- Internal dangers – most notably, the existing (but currently inactive) qualities of the analysed system, which operate as brakes on its development and pose a significant risk of losing the asset extension
- Stimulants – active external forces that contribute to the system's development.
- Disincentives — active external elements that operate as roadblocks or brakes to the development of a system.
 - External opportunities - the most significant current and future beneficial external elements.
 - External dangers - the majority of unfavorable external variables, the occurrence of which is highly likely in the projection horizon".

CHAPTER II. CRYPTOCURRENCIES AS THE HEDDING TOOLS DURING FINANCIAL CRISIS

2.1. Covid-19 crisis

The Covid-19 pandemic is a global pandemic of coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in 2019. This new virus was first identified during an outbreak in 2020/1/30 in a public health emergency of international importance by the World Health Organization (WHO), and in a Chinese city declared a pandemic in 2020/3/11. As of 2022/2/9, the pandemic has resulted in more than 4 billion 100 million cases and 576 million deaths, making it one of the deadliest in history.

The COVID-19 vaccination has been approved and predominantly found in a number of countries since 2020-12. Social distance, masking, enhanced ventilation and air filtration, and isolation of people who have been exposed or exhibit symptoms are among the other recommended preventive methods. Monoclonal antibodies, new antiviral medicines, and symptom management are among the options for treatment. Travel restrictions, closures, company limitations and closures, occupational hazard management, quarantine, testing systems, and monitoring of sick connections are among the actions and policies.

On a global scale, the epidemic is wreaking havoc on social and economic systems, including the worst global financial meltdown. Supply chain breakdowns and panic buying produce widespread supply shortages, including food shortages. The level of pollution has been decreased like never before as a result of the planetary blockade.

The virus and disease were dubbed "coronavirus," "Wuhan coronavirus," "the coronavirus epidemic," and "Wuhan coronavirus outbreak" during the original outbreak

in Wuhan, with the disease dubbed "Wuhan pneumonia." The World Health Organization (WHO) issued a recommendation in January 2020.

Greek letters are used by the WHO to identify genotypes of concern and mutations of interest. The tendency of calling them after the locations where the versions were discovered (for examples, Delta launched as the "Indian version") is no longer popular. A more rigorous naming mechanism is used for other variants and takes into account the variant's PANGO lineage (e.g., Omicron's lineage is B.1.1.529). SARS-CoV-2 is a novel virus linked to bat coronaviruses, pangolin coronaviruses, and SARS-CoV.

The first epidemic was reported in November 2019 in Wuhan, Hubei, China. Many of the first cases were related to people who had visited the Huanan Seafood Wholesale Market nearby, but human-to-human transmission may have started earlier. The virus is most likely zoonotic, originating in bats, according to scientific opinion or a mammal that is closely connected. Regardless, the question has sparked a lot of debate concerning other beginnings.

On December 1, 2019, the first recognized person became unwell. That guy had no ties to the subsequent wet market clustering. However, it's possible that an earlier accident happened on November 17th. The market was linked to two-thirds of the initial ruling constellation. According to a molecular clock analysis, the index case was most likely to be infected between mid-October and mid-November 2019.

Official "case" numbers refer to the number of people who have been tested for COVID-19 and whose results have been confirmed positive according to official protocols, regardless of whether or not they have had symptoms. Early on, many countries had government regulations prohibiting testing of persons with obesity, diabetic problems, mental disorders, and the overall number of ailments are the highest risk factors for serious illness minor symptoms. According to multiple studies, the overall number of infections is much higher than the number of cases reported. Covid-19 has had a significant impact on a variety of domains, including the international

trade, economic and financial sectors, and so on. Because developed economies are highly interconnected as a result of globalization, the true repercussions of Covid-19 could be much worse. Workers are absent due to disease or an increased risk of infection as a result of Covid-19, disrupting normal production in countries. Working hours have fallen dramatically during the Covid19 pandemic, according with International Labor Organization. As a result, the entire industrial chain was impacted significantly. In other terms, the Covid-19 causes a global economic downturn, which causes central banks to pursue expansionary monetary policy. It is possible to have comprehensive coverage on COVID-19's global economic and financial effects.

On April 9, 2020, initial studies revealed that 15% of a population sample in Gangelt, Germany, tested positive for monoclonal antibody. Gangelt is the epicenter of a significant illness cluster. Positive antibody tests were identified in pregnant women in New York City and blood donors in the Netherlands during COVID-19 screening, indicating that there were more infectious diseases than declared. Seroprevalence estimates are modest since some studies reveal that those with mild symptoms have no detectable antibodies.

In early 2020, an examination of cases in China by age revealed that only a small percentage of instances occurred in those under the age of 20. It was unclear as to whether it was due to the fact that citizens were less likely to be contaminated or to experience symptoms and also be checked. In China, a retrospective observational research discovered that children and adults were equally susceptible to infection.

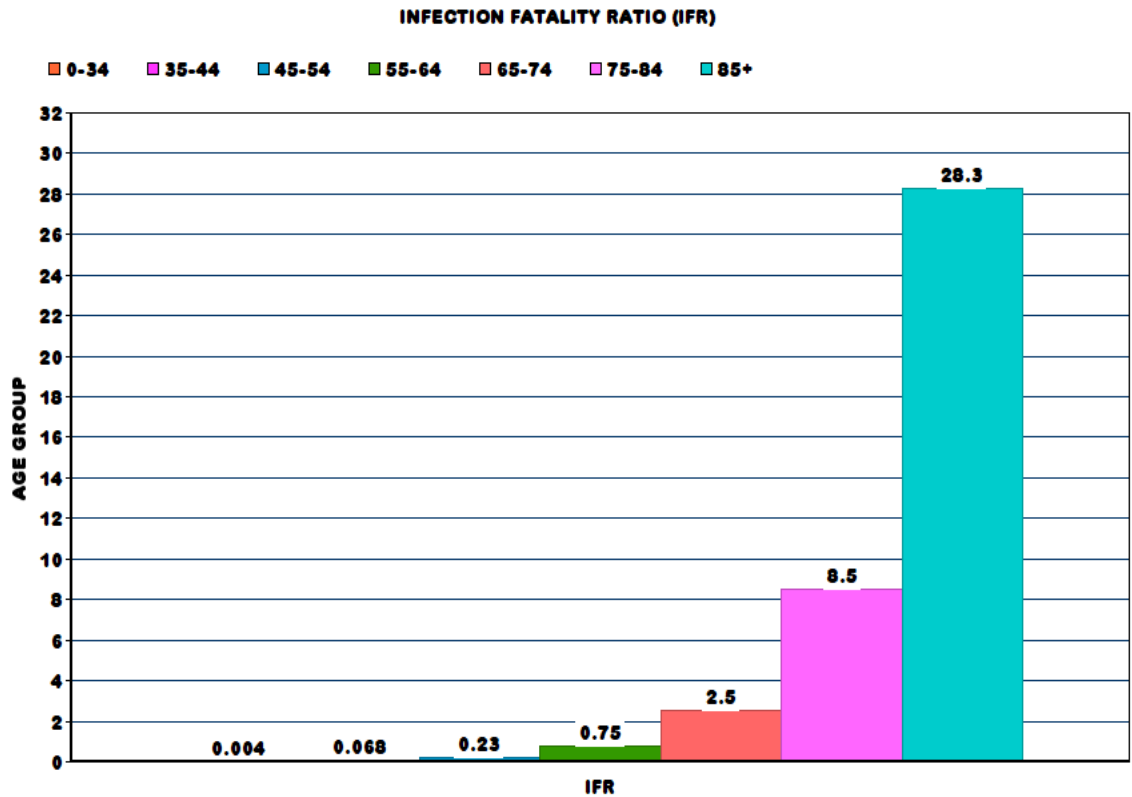
The initial sequence number (R_0) for COVID-19 was first estimated to be between 1.4 and 2.5 in January, however a subsequent investigation revealed that it may be about 5.7. The number of cases continued to rise in December 2021, owing to a variety of reasons, including new COVID-19 variations. As of the 28th of December, 282,790,822 people had been confirmed as infected around the world.

COVID-19 had been blamed for more than 5.76 million deaths as of February 9, 2022. On January 9, 2020, the first announced death occurred in Wuhan. Testing

quantity, healthcare system quality, possible treatments, government response, duration since the first outbreak, and demographic factors, such as, sex, age and overall health, all influence these figures.

Mortality is quantified using a variety of methods. People that died after failing a drug test are usually included in official death statistics. Without a testing, such counts eliminate deaths. Deaths of people that died from underlying diseases after a testing positive, on the other side, could be included. Deaths from suspected cases, even those without a test, are counted in certain countries, such as Belgium.

Excess mortality numbers (the proportion of fatalities in a period as compared to a long-term average) data result in an increase in deaths which is not attributed by COVID-19 deaths only, leading to claims that official death counts underreport the true death toll. The Economist estimated the actual figure of COVID-19 global deaths to be between 9.5 and 18.6 million, while the Institute for Health Metrics and Evaluation estimated it to be over 10.3 million. People have died due to healthcare capacity restrictions and priorities, and perhaps an unwillingness to seek care, are examples of such deaths. The duration between the onset of symptoms and mortality varies from 6 to 41 days, with the average being around 14 days. As people get older, their mortality rates rise. The elderly as well as those with underlying diseases are at the highest risk of being killed or death.



Source: Author's survey results

The infection fatality ratio (IFR) is calculated by dividing the total number of deaths caused by the disease by the total previously infected persons (including undiagnosed infections) and asymptomatic and). It is given in percent on average points rather than integers. This statistic is also known as the 'infection fatality risk' in other investigations. To put it into perspective, the IFR for middle-aged people is the two orders of magnitude comparison more frequently than the annualized total risk of a catastrophic automobile accident, and significantly more deadly than respiratory infections.

According to the systematic review and meta-analysis issued in December 2020, population-weighted IFR ranged from 0.5 percent to 1percent in some countries (the Netherlands, France, Portugal and New Zealand) Other countries (England, Australia,

Spain and Lithuania) range from 1percent to 2 percent, with Italy accounting for roughly 2.5 percent. The majority of the disparities, according to this study, were attributable to differences in the age structure of the population and the time of life pattern of diseases.

SARS-CoV-2 variants

WHO has identified some variants as variants of concern (VoC) or mutations of interests (VoI) (VoI). They both had the D614G mutation, which is more contagious: Delta overpowered and eventually wiped out earlier VoC in the majority of areas. Omicron's immune evasion capabilities may let it to proliferate through breakthrough infections, allowing it to cohabit alongside Delta, which infects the unvaccinated more frequently.

Table 5: Variants of Covid 19

Name of Variants	Lineage	Detected	Countries
<u>Alpha</u>	<u>B.1.1.7</u>	190	UK
<u>Beta</u>	<u>B.1.351</u>	140	South Africa
<u>Delta</u>	<u>B.1.617.2</u>	170	India
<u>Gamma</u>	<u>P.1</u>	90	Brazil
<u>Lambda</u>	<u>C.37</u>	30	Peru
<u>Mu</u>	<u>B.1.621</u>	57	Colombia
<u>Omicron</u>	<u>B.1.1.529</u>	77	Botswana

Source: Author's survey results

The pandemic and the response to it had a negative impact on the worldwide economy. Concerns over the epidemic devastated US stock indexes on February 27, causing them to plummet to their lowest levels since 2008. Travel restrictions, the closure of public areas, including tourist destinations, and governmental advice against traveling all contributed to the decline of tourism. Airlines have delayed flights, and the British minor airline Flybe has gone bankrupt. The tour operator industry was severely impacted, and railway stations and ferry ports were forced to close. International mail has been prohibited or cancelled.

Store hours were cut or stores were closed in the retail sector. Retailers in Latin America and Europe saw a 40% drop in foot traffic. Retailers in North America and the Middle East witnessed a 50–60% reduction in sales. In March, shopping malls saw a 33–43% reduction in foot traffic compared to February. Mall owners all across the world responded by improving sanitation, deploying thermal sensors to check shopper temperatures, and canceling activities.

Hundreds of millions of workers were lost as a result of the recession, which involves about 40 million Americans. According to a Yelp analysis, almost 60% of US businesses that closed will remain offline indefinite period.

2.2. Cryptocurrencies as the hedding tools

Measuring market risk for those who invest in the markets using cryptocurrencies, which are known to be highly volatile, has become increasingly important, especially with the news of the Covid-19 pandemic in the markets. The market risk of four different cryptocurrencies, Bitcoin, Ether, Litecoin, and Ripple, is evaluated and compared before and after the Covid-19 pandemic using Value at Risk (VaR) and Conditional VaR (Conditional VaR, CVaR). While VaR, which was previously used mostly in the stock market, employs the tail of a return distribution

including losses at a given level of confidence as a cut-off point, CVaR, which has the features of being a consistent risk measure, concentrates on the tail of the distribution by averaging the results. The study used parametric and non-parametric methodologies to determine VaR and CVaR, which were higher after the pandemic began than before. One of the most interesting findings is that, despite the fact that its value has increased after the pandemic, Bitcoin has the lowest VaR and CVaR of the four currencies both before and after the pandemic, making it a safer investment option. The non-parametric CVaR approach gives a safer risk measurement, according to the retrospective tests performed on the estimated VaR and CVaR. The findings give investors with quantifiable information on the susceptibility of bitcoin investment alternatives to losses.

Covid-19 has been affecting the entire world since January 2020, and the World Health Organization proclaimed a global pandemic on March 11, 2020, when the number of cases approached 500,000 and the disease spread to over 170 countries. The World Health Organization (WHO) initially reported a case in China on December 31, 2019. Because of the pandemic's increased incidence, the risk in financial markets became unpredictable, and investors lost money. Cryptocurrencies, which are popular among investors in both money exchanges and international transactions, have also been profoundly affected by the outbreak.

Financial and government institutions around the world routinely discuss the cryptocurrency sector, which has risen significantly in recent years. Because of the scale of its market value, Bitcoin is the most well-known of the thousands of cryptocurrencies. Bitcoin is the crypto currency with the biggest market value as of 2020, followed by Ether and Ripple (CoinMarketCap, 2020). Despite their benefits and drawbacks, cryptocurrency has seen a significant increase in the volume and frequency of transactions since 2008. Cryptocurrencies have time and cost advantages, such as quick transactions and minimal transfer fees, but they also have drawbacks, such as scaling, cyber security, and volatility. For investors, the price fluctuations of

cryptocurrencies, which defy the normalcy assumption, have positioned them as a viable alternative financial asset. Because of the unpredictability in price changes, cryptocurrencies are believed to be more volatile and thus riskier than traditional currencies .

It is critical for investors to understand the capabilities of cryptocurrencies in terms of risk management and portfolio analysis on the market. Economists frequently compare Bitcoin to gold since it shares many of the same characteristics. Bitcoin and gold both have a cheap cost of production and so have a high value. Although neither entity has a nationality nor is it governed by a government, the supply, management, and control procedures differ since they are driven by a number of independent operators and businesses. In light of information such as trading data from the Bitcoin exchange, transaction data from the Bitcoin Blockchain, visitor statistics for the Bitcoin Wikipedia article, and the dates of major Bitcoin events, (Glaser, Zimmarmann, Haferkorn, Weber, and Siering, 2014). Who are using the exchange for the first time to pay for goods or services. Instead of spending Bitcoins, they said they stored them in exchange wallets for speculation.

The fact that Bitcoin prices are affected by cryptocurrency news, and user requests have an impact on the number of Bitcoin exchanged on the exchange, but have no effect on the volume within the Bitcoin system, supports this conclusion in their analysis. According to the test findings they received with Bitcoin, Ether, and Ripple Sup Augmented Dickey Fuller technique, cryptocurrencies are open to speculative movements with price bubbles that occur in specific periods, and investors should be wary of these price bubbles. Despite the long-term cointegration relationship between Bitcoin and other traditional financial instruments, Kuzu and elik (2020) suggest that Bitcoin can be used as a portfolio diversification tool. The dangers it poses in terms of micro Cryptocurrency analysis is crucial for determining what role they play in the market. It focuses on estimating the risk of being exposed to the returns of cryptocurrencies if utilized as an investment instrument during the early stages of the

Covid-19 pandemic. Risk measurements such as R-square, Sharpe ratio, and beta, which have been used in finance for a long time, are used. Another risk indicator is Value at Risk-VaR1 (Likitracharoen, Ranong, Chuengsuksomboon, Sritanee, & Pansriwong, 2018), which is based on standard deviation and was introduced by JP Morgan in 1994 in technical documentation. VaR is a calculation that estimates how much loss a financial asset will cause with a certain probability over a specific time period. VaR approaches the tail of losses as the cutoff point in a return distribution with a particular confidence level, whereas Conditional VaR (CVaR), which provides the characteristics of VaR, approaches the tail of losses as the cutoff point in a return distribution with a specific confidence level. Takes the average value and focuses on the tail of the distribution to be a consistent risk measure. The application of VaR and CVaR, which were previously largely employed in the stock market, for the measurement of risk deriving from cryptocurrency price movements is presented in this paper. In the remainder of the paper, the first section covers a study of cryptocurrencies and the danger posed by price swings, as well as references to past studies. The parametric and non-parametric VaR techniques that will be utilized to quantify risk in crypto money returns are discussed in the study's second section. In the third section, VaR and CVaR are determined using these two methodologies by comparing the values of Bitcoin, Ether, Litecoin, and Ripple against TL.

The consistency of VaR estimates is tested by adding backtests to risk measures made using daily data for the period 15.01.2019 to 06.09.2020. This work did not require ethics committee approval or legal/special permission, and research and publication ethics were followed.

The risk of crypto money returns has been explored in two periods based on the findings, with a focus on the commencement of the Covid-19 outbreak and its aftermath. The World Health Organization reported the first case of Covid-19 on December 31, 2019. As a result, some research in the literature have used December 2019 as the cutoff point in comparison analyses before and after the pandemic's

commencement (Corbet et al., 2020; Ji, Zhang and Zhao, 2020). As a result, the findings of both periods are compared in this study, as the last 250 days of 2019 before the pandemic and the first 250 days of 2020 after the epidemic, using the most accessible data.

Assoc. Dr. Serhat Yüksel stated that due to the negative effects of the coronavirus on the economy, investors began to seek a "safe haven" for themselves and made the following assessments:

"Investors have preferred the dollar and gold as a safe haven since the first days of the pandemic. In addition, cryptocurrencies are among the investment tools preferred by investors in this process. As can be understood from here, it is seen that confidence in cryptocurrencies has increased during the pandemic process. When we look at the period before the pandemic, It is seen that the value of 1 Bitcoin was \$ 6 thousand 946 on January 2, 2020. In March, when the effect of the pandemic increased, it fell to \$ 5 thousand 24. On the other hand, it is seen that this value radically increased to \$ 23 thousand 826 as of December 22, 2020. When we look at the data, it is seen that there are very serious transactions in cryptocurrencies, especially during the pandemic period. This situation causes the value of cryptocurrencies to increase."

Pointing out that country governments and crypto money companies have an important role to play, Yüksel said that country governments should create the necessary legal ground for cryptocurrencies in detail, and that the existence of detailed laws and regulations on this issue will increase investors' trust in cryptocurrencies.

Stating that crypto money companies should also take the necessary security measures, Yüksel said, "For this purpose, necessary measures should be taken for the security of user accounts and software systems. These issues also contribute to investors' inclination towards crypto currencies. "This will increase his anxiety towards these tools. This will cause sharp fluctuations in the prices of cryptocurrencies." he said. On the other hand, as of December 22, 2020, this value has risen dramatically to \$ 23 thousand 826. When we look at the figures, we can tell that there are a lot of major

cryptocurrency transactions, especially during the epidemic. The cost of cryptocurrencies rises as a result of these issues."

Country governments, Yüksel added, should provide the appropriate legal footing for currencies in detail, and the availability of specific rules and regulations on this issue will strengthen investors' confidence in cryptocurrencies.

Yüksel stated that crypto currency enterprises should also take the appropriate security precautions "To achieve this, the essential security measures should be taken. These concerns also influence investors' decision to invest in crypto currencies. "This will make him more fearful of these tools. Cryptocurrency prices will be volatile as a result of this asset.

In March 2020, connection reached its greatest point, indicating a considerable increase in volatility. There are numerous instances of this issue. It's thought to be psychological. Also in January and February of 2020. The increase in global financial market fragility that occurred during the may have increased.

The financial/geopolitical fragility of cryptocurrency interconnection has increased significantly over time, affecting investors, policymakers, and academics' actions. In accordance with the findings of our research and the literature. As a result, the COVID-19 global epidemic's cryptocurrency connectivity has been discovered to be significantly boosted. This circumstance offers investors a short-term profit opportunity and has the ability to deliver. The one with the biggest market transaction volume, on the other hand.

The literature on cryptocurrencies as net purchasers differs from various studies, according to the conclusions of the direction spread table. Furthermore, COVID-19's long-term connectivity.

Except for the period of one year, greater values for short and medium-term connectivity were discovered. It is also regarded as one of the study's original findings. long-term and medium-term The risk of extreme volatility in the this market being reflected in other markets via various transmission routes. Authorities closely monitor

cryptocurrency market price developments, which should be observed. In this case, establishing a regulatory framework may be advantageous.

Cryptocurrency and Risk

When investors invest in risky financial assets or take on financial risk against the expectation of a return, this is referred to as risk appetite. In any financial market, indices were designed to analyze changes in risk appetite information from the markets combined with the specific circumstances of the markets.

The fragility of risk appetite indices in the absence of change offers crucial information about risk appetite. during certain times Asset prices will fluctuate if the index is above its regular range. In addition, market sentiment

The risk appetite index, which is used as a measure of financial risk, is monitored. Risk appetite has been dropping since 2019, according to the indices, while Bitcoin's value has been climbing. Uncertainty and crisis risk limit risk appetite in financial markets, as they have in recent days, and have a negative impact on the economy. Political and economic trends, laws, and supply and demand imbalances are all factors to consider. It has an impact on Bitcoin's value.

The grounds for the rise in Bitcoin's value include an increase in digitalization, the last two closely watching technical changes every year and adjusting very rapidly as a young investor who gives huge investment institutions across the world with Bitcoin to invest in. Covid-19, the digitalization of financial markets, reached a new height with the outbreak. Cryptocurrencies, like Bitcoin, have made a significant contribution to this development. Which is fast growing in popularity and is in high demand. As a result of the Covid-19 pandemic, there has been a growth in internet commerce and cryptocurrency.

The fact that it is decentralized has drawn a large number of enterprises to this industry. America and England are very important in the epidemic phase. Some Turkish financial firms have indicated that they are channeling millions of dollars into cryptocurrencies. Bitcoin-based During this period, certain experts and institutions who

had previously expressed reservations about crypto money exchanges have begun to express more supportive views. The global economy is planning for post-pandemic cryptocurrency as a way to mitigate risks.

Cryptocurrency has arisen as a payment instrument that can cope with costs associated with developing technology, such as lost time and reliance on physical circumstances. It allows people to pay directly from person to person and in a virtual environment without providing personal information, using cryptographic evidence rather than semi-trust, and without going through a middleman. In this mode of payment, no national legal (fiat, fiat) currency is used. According to various sources, the number of cryptocurrencies available on the market fluctuates. Although it is impossible to estimate the precise number of cryptocurrencies in existence, CoinMarketCap, the largest crypto money database, lists 3600 coins as of October 2020, with the six largest cryptocurrencies with the highest market capitalization. Tether, Bitcoin, Ether, Litecoin, Bitcoin Cash, and Ripple have the greatest market capitalisation.

Tether: Tether is a cryptocurrency that attempts to maintain its value at \$1 USD regardless of market swings, providing insurance against excessive volatility. It is considered as stable money between virtual and nominal currencies because of its fixed value. Tether is the most popular stable coin and has the biggest trading volume. It is also the fourth crypto currency with the highest market capitalization.

Bitcoin: Bitcoin is the most valuable cryptocurrency in terms of market capitalization. Its name is derived from the terms 'bit,' which refers to the smallest data size unit, and 'coin,' which refers to a coin. BTC was established in 2008 as an electronic payment system by an individual or group using the pseudonym Satoshi Nakamoto, based on studies dating back to the 1970s.

Ethereum: Ethereum is the second most valuable cryptocurrency by market capitalization. The Ethereum-owned cryptocurrency is the first smart contract platform. Ethereum is an intermediary network that monitors a variety of transactions including

data storage, mortgage transfers, and financial instruments in addition to crypto money transfers, with Ether as the platform's cryptocurrency.

Litecoin: It is one of the oldest cryptocurrencies, developed in 2011 as a faster and lower cost alternative to Bitcoin.

Ripple: It is a payment infrastructure that is a cheap and fast solution to the international money transfer system, which takes a long time and has high transaction fees. XRP is currently the third cryptocurrency with the highest market capitalization in this structure.

Bitcoin Cash: It is one of the two forks formed by the splitting of the Bitcoin project, which started to slow down and increase cost with the growth. Bitcoin Cash technology, which has a larger block size than Bitcoin, offers faster transactions and lower costs. Bitcoin, which has the highest market value, appears as the most researched cryptocurrency in literature reviews. The only reason for the rise in Bitcoin's price is to raise awareness by having experts from across the world discuss it, for it to be accepted by multinational firms in trade transactions, and for it to be legalized in some nations with legal restrictions. As a result of investor interest, price hikes occurred, and BTC joined the futures market.

It is possible for investors to take a position in inefficient financial markets by analyzing and estimating the rewards. Cryptocurrency swings, on the other hand, expose those who possess them for the purpose of making transactions or employing them in the stock market to market risk. The analyses demonstrate an upward trend in crypto currency pricing as well as a significant level of return volatility as a risk factor.

Despite the significant risk in the cryptocurrency industry, overall market transaction volume of cryptocurrency has grown to \$948.2 billion from \$10.6 billion in 2020, an increase of more than 8900 percent between 2013 and 2020. Between January 2016 and January 2020, the closing price of Bitcoin climbed from \$378 to 34,279 dollars. This rise equates to a 208.5 percent yearly return on investment, which is extremely difficult to achieve with a financial instrument. The trading activity of

investment managers in the bitcoin market is expanding as a result of this high return. Cryptocurrencies. Investors and speculators are flocking to the cryptocurrency market because of the high return potential, and the market volume is growing by the day. As the cryptocurrency market's trading volume grows, researcher observes the price dynamic nature of digital currencies and other financial instruments in order to better understand how they interact with the markets. Cryptocurrency research shows that the market has a close link to the financial markets. The cryptocurrency stock market and its markets have been studied, as well as the cryptocurrency market and derivatives markets. Studies have also been conducted to determine the cryptocurrency market's high interconnectivity with the foreign currency exchange and bond markets.

The cryptocurrency market is extremely connected to the financial markets.

An unanticipated shock in the bitcoin market can swiftly spread to other markets, causing a chain reaction. However, during times of financial turmoil, the correlation and co-movement of financial assets, including cryptocurrencies, is increasing.

The influence of the COVID-19 epidemic on cryptocurrency market connection is examined in this study. Its goal was to look into the impact of the

After that, the correlation between the eight cryptocurrencies with the biggest market trading volume was studied.

In two ways, our research adds to the existing body of knowledge. First, during the COVID19 worldwide pandemic, the cryptocurrencies with the biggest trading volume in the market, historical volatility interconnectivity, and directional spreads across variables evaluated by the approach. Second, cryptocurrency volatility in the past. The FC method is used to investigate connectivity at various frequencies (short, medium, and long term).

As a result, the study concentrated on the prices of cryptocurrencies with the biggest market transaction volume, as well as the interconnection of their volatility during periods of financial/geopolitical recession/confusion, and presented significant findings.

Many studies on the modeling of the volatility of various cryptocurrencies, particularly Bitcoin, have yielded useful results. (Akkuş and elik (2020)) observed long memory in the Bitcoin return volatility and found long memory in the BTC np law in their study, which used asymmetric volatility models. Positive news shocks boost volatility more than negative news shocks, according to the findings. As a result, the information made public has an impact on the volatility of BTC prices. Technical analysis methods can theoretically anticipate prices in a cryptocurrency market when the asymmetric information environment is dominating and price movements are influenced by speculative factors.

They discovered that the top ten cryptocurrencies by market capitalization by evaluating the causality of the price swings of Bitcoin, Ether, and Ripple cryptocurrencies, as well as high transaction volume interacted in the short term. Kanat and Get believe that the stock exchanges in the United Kingdom (FTSE), the United States (S&P 500), and Canada (STX) can provide insight into the short-term fluctuation of the Bitcoin price, allowing investors to diversify their risks by investing in Bitcoin. Furthermore, (Kılıç and İtücü (2018)) discovered that the BIST-100 index and BTC prices have no cointegration effect in the medium and long run. Similarly, Azmov and Alkan (2019) investigated the exchange rate of China's and Russia's national currencies versus the US dollar. As a result of their econometric analysis, these countries' national reserves and market indices, as well as the performance of Bitcoin against the dollar They came to the conclusion that they are long-term cointegrated. It's important to remember that the findings of all of these research are legally enforceable for the time period they cover.

What are the risks of cryptocurrency trading?

Cryptocurrencies, such as bitcoin (BTC), are deemed dangerous for a variety of reasons. These are some of them:

1. **Lack of regulation.** Because cryptocurrencies are decentralized, banks and governments are still trying to figure out how to best safeguard traders and investors

who purchase and sell them. Bitcoin's decentralized structure has enthralled its followers, but if it rises in popularity, it may cause legal and tax issues.

2. **Susceptibility to hacking.** Every year, a large amount of bitcoins are stolen from digital wallets. It is believed that \$1.7 billion in cryptocurrency was stolen in 2018, and there is rarely a means to recover these losses.

3. **Reliance on technology.** Bitcoin and other cryptos are entirely digital assets, which implies that without access to technology resources, they are virtually worthless. You obtain ownership of something that can be exchanged with gold, real land, or even shares, whereas cryptocurrencies have no such support.

4. **Market volatility.** Cryptocurrencies are famously volatile in both intraday and long-term trade. For example, bitcoin's price soared to a high of \$19,763.50 in December 2017, before plummeting to a low of \$3126.29 in December the following year. There are, however, techniques to limit the risk you incur, at least to a recognized level, for those willing to study. Here's when risk management tools like stop-losses and tactics like hedging come in handy.

2.2.1. Bitcoin as a hedge

One of the most popular investing thesis surrounding Bitcoin is that it is an excellent inflation hedge. Once all 21 million Bitcoins have been mined, the supply will be limited. In principle, Bitcoin's restricted supply should make it a suitable hedge against the US dollar's growing supply.

When we look at the statistics on Bitcoin's price patterns and genuine inflation, this notion is called into doubt. Is Bitcoin actually an efficient inflation hedge, or are its movements due to something else? The Bitcoin derivatives market has raised awareness and interest in the cryptocurrency industry among hedgers, institutional investors and speculators. Since that day, Bitcoin futures, like some of the other futures contracts that serve both hedging and speculating purposes, have attracted a growing

number of investors looking to speculate on Bitcoin's potential price without actually holding the commodity.

Bitcoin futures contracts allow investors to take short bets in the Bitcoin market. This would also make it easier to shift risk from hedging to speculation and vice versa.

As with other well-known derivatives, it attracts informed traders. However, as with many other markets, the marketplace may be controlled by inexperienced traders, making Bitcoin price discovery difficult uncertain. There's also evidence that the launch of Bitcoin futures contributed to a rise in Bitcoin volatility. Bitcoin lacks the features of conventional currency, is unregulated, and is prone to activities that exacerbate its volatility. Given these findings, as well as the growing interest in the Bitcoin futures market's potential for hedging or speculation, it's critical to thoroughly explore the speculation/hedging motivations driving Bitcoin futures trading. The goal of this research is to determine if speculation or hedge fund managers lead the Bitcoin futures markets.

Bitcoin is one of the most complex technological and financial goods, and it is considered an exceptional marvel of the 4th Industrial Revolution. It's been a focal point for investors looking for a safe haven asset for a long time. We employ the wavelet-based quantile-on-quantile approach and the quantile-based Multiple regression method in this work to study whether Bitcoin is a safe-haven asset in the face of political and economic uncertainty in the United States between 2010:M06 and 2020:M10. Using the Partisan Conflict Index (PCI) and the Economic Policy Uncertainty Index (EPU) as proxy for uncertainty, we discover that, while Bitcoin looks to be a safe haven asset when uncertainty is high, it is not. This association is subject to alter in the short to long term. In this regard, our sample gives us a rare opportunity to test the safe haven hypothesis for Bitcoin throughout a period that includes three US Presidential elections and, most recently, a COVID-19 outbreak that has been designated a global pandemic. As a measure of robustness, we reinforced our analysis with the bootstrap rolling window causality approach. In light of the recent COVID-19 outbreak and the current

economic environment, our research gives useful information for investors who want to build Bitcoin-based investment portfolios, as well as ideas for regulators on how to effectively manage cryptocurrency speculation.

Why is Bitcoin seen as a safe haven against inflation?

Bitcoin's philosophy of inflation protection is straightforward. The total number of Bitcoins is capped at 21 million, but the number of US dollars increases over time. If the quantity of the US dollar rises, the price of Bitcoin in dollars may rise as well, assuming all other factors remain constant.

Here's a very basic illustration of how much Bitcoin will be worth if the stockpile of dollars doubles. In all cases, I presume that the "market capitalization" of the US dollar and Bitcoin is equals.

If the supply of US dollars increases, the Bitcoin's value should double in proportion to the US dollar. This is not necessarily how the market works.

So far, Bitcoin hasn't shown to be a good hedge.

Back before the pandemic, Bitcoin didn't appear to be a good hedge. Bitcoin's popularity soared in late 2017 before plummeting in 2018 and early 2019, and this had nothing to do with inflation. The M2 money supply increased by 25.3 percent during this time, while gold would of been a stronger direct hedge, rising by 51.9 percent.

Bitcoin hasn't behaved as a hedge in recent years as true inflation has set in. As you can see from the graph below, inflation and inflation expectations have been rising all year, while Bitcoin has dropped since late February. The iShares TIPS Bond ETF, a corporate bond of inflation-protected treasuries, would have been a better choice for investors wishing to hedge inflation.

Bitcoin's value has fluctuated significantly over the last decade. It hasn't, however, been linked to inflation in any significant sense. Bitcoin hasn't been consistently connected with growth or inflation equities, and was negatively correlated for much of the last year (a correlation value of 1.0 indicates they move in opposite directions, while a coefficient of -1.0 says they move in opposite directions).

Gold (Bitcoin) is adversely (positively) connected both industry and style portfolios, according to the correlation statistics. According to the facts, the link between the entire economy market and gold (Bitcoin) is not symmetric.

As a result, it provides a safe haven and hedging opportunity. We work with Baur and McDermott's (2010) method for estimating the relationship when it comes to choosing between gold (Bitcoin) and style (industry market) portfolios. The latter has a lot of negative returns. Consequently, We're interested in finding a safe refuge and hedging our bets. For style and industry portfolios, gold (Bitcoin) has a lot of promise. The findings principally suggest that gold is a weak hedge and safe-haven for all investing procedures, particularly large-cap investments. When large-cap investment style ties with equities with stronger growth characteristics such as more investment, higher operating income, and long-term return reversals, gold's safe-haven and hedging potential is strongest. When compared to a small-cap investment portfolio with similar features, major investment portfolios with more investment and operating earnings enjoy better protection against gold. When a stock characteristic like lesser investment, poorer growth, short- and long-term return reversal is combined with a small-cap investment strategy, gold gives the lowest safe-haven and hedging potential.

How to hedge bitcoin

However, with the exception of some large-cap investments, Bitcoin does not appear to be a safe-haven or hedging asset for almost all the style portfolios. Hedging bitcoins, or any cryptocurrencies, entails opening trades carefully because a gains and losses in one side is offset by changes in the value of the other.

In general, if you're worried about the risk to your position, it's probably safer to reduce the size of your position or close it entirely. Hedging, on the other hand, is seen as a good method for traders who wish to keep their bitcoin holdings while creating a

neutral exposure. There are several strategies for achieving cryptocurrencies hedge, but three of the most prevalent are:

1. Short-selling
2. Hedging with CFDs
3. Hedging with futures

Short-selling bitcoin: Short-selling is the act of selling an asset with the expectation that its value will decline and you will be able to repurchase it at a lower price, earning from the difference. Whether it's a bitcoin ownership or a speculative trade, shorting bitcoin is a frequent hedge against an extended exposure. If you already hold bitcoin but anticipate it will fall in value in the near future, you may want to hedge your bets by taking a short position. If the market falls, the earnings on your short squeeze will help to cover a few of the loss on your initial position. Borrowing bitcoin from a dealer or third party, trading it on the open market, and then releasing the coins to their owner is the typical technique of short-selling bitcoin. Short-selling is possible on a few cryptocurrency exchanges, but finding a third party to lend you the asset might be challenging. Even if you locate a willing lender, they have the right to recall their assets at any time, which could force you to purchase the coins at a significantly higher market price. Let's imagine you borrowed \$10,000 worth of bitcoin to short-sell. However, rather than decreasing in price, the price rose to \$12,000. The bitcoin would have to be purchased. You'd have to repurchase the bitcoin at the current market price, resulting in a \$2000 loss.

CFD trading is one of the most common strategies to hedge bitcoin. To open a trade in a derivative product, you would not need to possess the underlying cryptocurrency. This means you can trade on bitcoin's price without having to bother about setting up an exchanging account or a digital wallet.

Another advantage of futures is that they allow you to profit from both falling and rising markets — in other words, they allow you to short-sell bitcoin without

borrowing it. This is a critical characteristic for hedgers, who must be capable of protecting themselves from falling asset values. You can use derivatives to adopt a variety of techniques, but direct hedging are among the most popular. This entails simultaneously taking two configurations on the same cryptocurrencies, but in different directions.

Assume you hold two BTC and, while you believe in the technology's long-term promise, you are concerned about short-term volatility affecting your stake. You opt to hedge against bitcoins rather than sell them. To short bitcoin, you execute a CFD trade. You could shut your direct hedge once any negative price action has passed, and the profit from the CFD trade would equal the loss from your cryptocurrency holding. And if the value of bitcoin does not fall, the profit from your holding will compensate for any losses in your bitcoin CFD.

Bitcoin is also a poor hedging for portfolios with a high long-term reverse and a large-cap approach. Our findings of gold's hedging potential and safe-haven for large-cap styles add to the evidence presented by He et al (2018). The fact that well-known market indices like the S&P500 are predominantly used as a benchmark for huge investments leads us to this conclusion. Our observations for small-cap equities, on the other hand, provide a new dimension to the existing research and call into doubt the strong evidence for overall market indexes' safe-haven and hedging capabilities . All industry portfolios (telecom and energy), with the exception of utilities, are a strong (weak) hedge. In addition, with the exception of energy and utilities, gold has a weak (strong) safe-haven capability for all industrial technology (Shops). Use the Dow Jones industrial indexes to report on gold's non-safe-haven nature for the utilities business. It's worth noting that gold's safe-haven and hedge potential is stronger in cyclical industry portfolios like retail, consumer items, and manufacturing, and weaker in noncyclical industry portfolios like nondurables.

Bitcoin, on the other hand, is a good safe-haven and hedge for the health-care industry. Furthermore, Bitcoin's safe-haven viability for highly perishable and utilities

business portfolios is limited. Surprisingly, Bitcoin only has safe-haven and hedge potential for noncyclical industrial portfolios, whereas gold does not. In the context of utilities industry portfolios, for example, Bitcoin has a negative correlation under normal circumstances, whereas gold does not. Our findings about the capabilities of bitcoin and gold to safeguard noncyclical and cyclical industry portfolios in different ways give new evidence that can help portfolio managers improve their hedging alternatives significantly.

These findings may be beneficial to industry portfolio investors by selecting the appropriate hedging and safe-haven instrument their portfolios of industries.

Overall, gold has both protected and hedge potential for all types of portfolios, but it is more obvious for large-cap stocks with more growth potential characteristics. This evidence of hedging and safe-haven potential is consistent and adds to the body of knowledge. There is a lot of evidence for a lot of different investment styles. Similarly, our findings on the potential for safe-haven and hedging gold for industrial technology adds to the evidence already available.

According to our data, gold has a weak safe-haven potential for all styles of portfolios and most industry portfolios. In large-cap style portfolios and cyclical industries, these outcomes are more prominent. Bitcoin, on the other hand, is a weak safe-haven for multiple big style and cyclical industry portfolios, with the exception of the health sector, where it is a strong safe-haven. With the exception of utilities, energy, and telecom, gold is a low hedge for most of the style as well as many industry portfolios in terms of hedging potential. Gold's hedging potential is more obvious for humongous styles and dynamic industry portfolios, once again.

Bitcoin, on the other hand, has limited hedging possibilities for large-cap portfolios. Bitcoin's hedging potential, on the other hand, is more obvious in noncyclical businesses. This discovery could be attributed to Bitcoin's generally steady and noncyclical characteristics, which distinguish it from gold. For example, central bank policies that affect even noncyclical businesses and financial markets, such as

gold, do not appear to have an impact on Bitcoin's liquidity and volatility. As a result, it's probable that Bitcoin's hedge potential for noncyclical sector companies is greater than for cyclical industry stocks.

We also look at how gold (Bitcoin) might help with hedging and conditional diversity in style and business portfolios. In comparison to gold, our findings demonstrate that an investor needs a smaller quantity to hedging downside risk with Bitcoin. Gold, on the other hand, has a higher hedging efficacy than Bitcoin, making it a stronger hedge. Furthermore, the benefits of having gold in a portfolio amid market upheaval are higher in similarly weighted portfolios, according to diversification data. A small presence of Bitcoin in a style (industry) portfolio, on the other hand, provides the greatest diversification benefit.

Overall, our analyses show that gold outperforms Bitcoin in terms of hedging and safety in the US equity market. However, we do uncover several portfolios based on style and industry where Bitcoin performs better. For equities investors, our findings have a number of ramifications. First, from the perspective of a style portfolio investor, our data imply that gold and Bitcoin provide greater security to uncertainty portfolio investors than to risk-takers. Second, for cyclical and noncyclical industrial portfolio investors, gold and Bitcoin offer better hedging and safe-haven potential, respectively. Furthermore, our contingent diversification benefit analysis reveals that, in order to maximize portfolio performance, investors must carefully select the weight of gold (Bitcoin) in the portfolio. Our results are of interest to the aforementioned economic agents, as they now have empirical proof that gold is still glistening, and that, despite its remarkable growth over the last decade, Bitcoin still needs time to catch up to gold. Lastly, future research could build on these findings by looking at the equities markets in various developed and developing countries, as well as comparing other commodities and cryptocurrencies.

2.2.2. Other cryptocurrencies as a hedge

Investors have gotten increasingly focused on finding hedges against inflation since the elimination of the myth that it is "transitory" in the US economy. "The rate of inflation has been creating anxiety within investors previously as the Fed has been into a printing frenzy," according to the Motley Fool. There have been requests to halt the printing rate, but it has continued thus far, leading inflation rates to rise."

Bitcoin is being hailed as a solid hedge by an expanding chorus of voices, including:

Paul Tudor Jones. The wealthy investor believes cryptocurrency is a stronger inflation hedge than gold, describing Bitcoin as "a terrific tool to protect capital over time" and "a store of money like gold."

JP Morgan. "Institutional investors seemed to be turning to Bitcoin, perceiving it as a superior inflation hedge than gold," the investment group advised its customers in an October report. According to the report, US politicians have stated that they will not prohibit the use or mining of cryptocurrency, as China has done.

There are disagreeing (at the very least, opposing) viewpoints from people like:

Morningstar. "The argument that hedging against inflation depends on inadequate data," the investment ratings agency said in a review of the evolving rounds of inflation in the United States. While it's plausible to believe that bitcoin will aid in the survival of a portfolio against inflation's ravages, this is far from certain."

"Bitcoin has not been compelling as an inflation hedge, as," and that "the accusation for trying to hold Bitcoin is not declining volatility, diversification or inflation protection, but instead just sheer price gains."

Ethereum was investigated as a hedge against inflation by a group of professors from various Australian universities. "Ethereum has a reduced net issuance ratio of the tokens than Bitcoin as a result of a recent update in its operations protocol, which was done by eliminating the fees connected with each transaction." In many circumstances,

the quantity of Ethereum burned exceeds the network's ability to create new tokens, potentially becoming Ethereum the world's first deflationary currency."

According to the authors, this gives Ethereum a better inflation hedge and long-term value store than Bitcoin. The authors cite two reasons for this:

- The issuance rate of Ethereum. Without relying on a hard supply cap, the growth of ETH supply has slowed since about the start of August 2021 (as protocol version EIP-1559 was released). With a consistent pace of token generation, token destruction has continuously increased, eventually catching up to the quantity of tokens released by September 2021. Furthermore, for the first 2 weeks just after modification, the percentage of contractionary blocks is low, but soon rises to about 50% of all blocks by the conclusion of the sample period.

- The rise of decentralized finance. DeFi is an different financing infrastructures constructed on the Ethereum blockchain, now has over \$113.4 billion in smart contract funds. With the growing popularity of non-fungible tokens (NFTs), the most of which have been using the Ethereum network, the network will likely continue to be congested, increasing the pace at which ETH is burned.

However, there are many who doubt Ethereum's ability to act as an inflation hedge. According to the Motley Fool:

"It's crucial to remember that the purpose of the Ethereum 2.0 update should not be to create Ethereum extra scarce, but to reduce gas fees and network access. The networks lost control over the production of Ethereum as each transaction burns the base fee, thus while Ethereum may appear to be deflationary at times, it's also possible that the cryptocurrency's supply will expand."

Noelle Acheson, chief of market analytics at Genesis Global Trading, is quoted in the article:

"There is a lot of misunderstanding out there on how deflationary Ethereum is. It is on occasion, but that is not the point." Overall, Ethereum's advantages over Bitcoin

as a hedge against inflation may have less to do with the cryptocurrency's supply and more about its other uses. Mike Novogratz, CEO of Galaxy Digital, remarked on CNBC: "As bitcoin's appeal as a hedging against a depreciating currency wanes, ethereum is outperforming as supporters observe potential with in solutions afforded by the underlying technology." Ethereum is seen as a technological bet." I believe the verdict according to whether Ethereum and Bitcoin are inflation hedges is yet out. However, one thing to keep in mind about just the London Fork and the whole Ethereum 2.0 improvement is that the goal isn't to make Ethereum more rare, but rather to reduce gas fees and network access. The networks lose control over the quantity of Ethereum as each transaction burns the base fee, thus while Ethereum may appear to be deflationary at times, it's also possible that the cryptocurrency's supply will expand.

"There's a lot of misconceptions out there about how deflationary Ethereum is," Noelle Acheson, president of market research at Genesis Global Trade, told Bloomberg recently. "Yes, it happens once and then, but it's rare."

To summarize, while I cannot declare with sure that Ethereum hedge inflation, this recent update has significantly reduced Ether supply and is expected to continue to do so in the future, which is good news for Ethereum investors.

- Litecoin: Litecoin has been being squeezed out of the top-10 coins categorized by market valuation over the last year or two. Newer coins, as expected, quickly gained momentum on the charts.

The alt has kept a quiet profile in recent months, luring the market with the prospect of a breakout. Finally, Litecoin's price has increased by about 40% in the last three days. The bullish impetus predicted by the mainstream market was the key reason behind this increase. Other influences, however, cannot be excluded out. It wasn't surprising that Litecoin followed in the footsteps of mega-cap cryptocurrencies like Bitcoin and Ethereum, which saw double-digit rises and new all-time highs. The link

between Litecoin and Bitcoin's new ATHs, in particular, had a key influence in the current price increase. Surprisingly, as the price increased, the direct relationship to Bitcoin increased as well. Furthermore, the foundations of the 14th-ranked coin appear to be solid.

However, despite price rises, its cumulative fluctuation remained low and showed a downward trend. LTC became more stable in the face of large price swings as a result of this. In reality, Litecoin has shown respectable three-month and one-month ROIs of 50% and 62 percent, respectively, when compared to USD.

Not to mention, Litecoin's sluggish price movement and smaller returns have been heavily panned in the market. However, because LTC is frequently considered as a possible commerce-oriented token, its legacy is strong.

In October, inflation in the United States reached a 30-year high. In this setting, it appeared that older, safe haven coins like Litecoin remained a suitable inflation hedge. Historically, Litecoin has surged in response to bad sentiment against fiat currencies, as investors seek alternative asset classes to combat inflation fears.

Litecoin, on the other hand, isn't just a hedge against inflation this time. In fact, HODLers are expected to make more money as the price rises. LTC has a good chance of breaking \$500. By checking at the aSOPR of Litecoin, the same could be verified. ATH values after May 9 were noted in this metric. Moreover, this suggested that the coins were planning to sell at a profit on average.

- **Tether:** Tether can be purchased on the majority of major crypto exchange, but must you buy given its past and future prospects? Despite its history of troubles, Tether remains a fairly stable currency that is better for having largely avoided them – at least so far.

Tether is the largest type of cryptocurrency and is commonly used for trading, borrowing, and generating interest, despite the fact that competitors have emerged over

time. Tether is among the riskier cryptocurrencies, owing to its lack of transparency, but it remains vital in the cryptocurrency industry. Tether and some other stable coins have made it simple and quick to convert any cryptocurrency to Tether, whereas turning a virtual currencies to cash could take several days and incur transaction costs. This provides liquidity to exchange platforms, provides investors with no-cost exit methods, and increases the flexibility and stability of their portfolios. Tether may also be transmitted anywhere in the world more faster and with cheaper fees than typical bank and financial institution payments. While most individuals would avoid using Ethereum or Bitcoin for everyday purchases and transactions because to their extreme volatility, Tether makes perfect sense. For these and other reasons, it is still wise to evaluate Tether as a potential investment. While Tether is not a long-term investment which will increase your money on its own due to its peg to the US \$, there really are lending companies, exchanges, and cards which will give you significant interest rates for storing USDT on their platform.

Table 6: The Tether interest rates for some platforms

PLATFORM	USTD APY % (Percentage)
BlockFi	9.50
Celsius	8.50
Nexo	12
Youhodler	12.3
Binance	10

Source: Author's survey results

CHAPTER III. CRYPTOCURRENCY AND STABILITY OF CURRENT FINANCIAL SYSTEM

3.1. The financial economics of cryptocurrencies

In the bitcoin world, there are an increasing number of divergent viewpoints. One side believes that cryptocurrencies are a constant threat to the financial system, while the other believes that cryptocurrencies have a bright future. The popular belief is that Bitcoin is just a gigantic bubble or a commodity, not a money. Similarly, some economists believe that in the future, digital money may be the only world currency. Financial stability include investor risk management, allocation of resources (taxation), proper operation of financial intermediation – banks, hedge funds, exchanges, and so on – as well as innovation (e-banking, blockchain), money transfer security, and a solid regulatory framework. All of these terms have an impact on the country's financial system. We're trying to figure out if it's viable to run a financial system no intermediaries using cryptocurrencies, or if they're just a giant bubble.

While they are theories perhaps we will hear from those who are highly interested in the issue, Blockchain and Bitcoin, which are perhaps the most prominent topics today, are seen as synonymous phrases used interchangeably in the time between 2008 and 2012. The concepts are still fresh, and there is no vocabulary in the local literature to describe them.

One of the variables leading to the conceptual ambiguity is variability.

We frequently employ to describe these difficult technological concepts, but we do not need to understand the underlying infrastructure to do so.

It is possible to provide examples of technological concepts. Cryptocurrency, blockchain, and Electronic information is once again used to effectively understand the fundamentals of Bitcoin. Another example is the "internet," a technological product.

The Internet is a global electrical and device network.

A computer communication network that permits individuals to communicate at speeds close to the speed of light using an electrical device. Electronic services (Online Exchanges and Internet banking) make up too little a part of this communication to be counted as only a small element of the service. Money markets (Payment Brokerage Systems) organizations provide only a handful of the services provided by electronic companies such as Visa, Master Card, and PayPal. Similarly, in order to create a new record, a blockchain requires the approval of the overall majority of all existing users, and once this data is inserted, it is difficult to change technology for registries. Cryptocurrencies are one of the many of applications for this technology. Blockchain technology has given rise to cryptocurrencies.

Currency and payment systems were formed independently of any central systems. This technology infrastructure has been used to create hundreds of coins.

Bitcoin was the predecessor of the currency unit. One of the most well-known recent examples of the global financial system is an American home loan, which sparked a global economic crisis after it defaulted. The year 2008, whenever the application crisis began, was the year when Bitcoin was first introduced. The year the paper was published was attributed to a person, persons, or entity using the pseudonym Satoshi Nakamoto. Between two points, electronic money is used. The essay proposes a decentralized tracking system for the transmission of theoretical money. "Bitcoin" is the name of the unit. S.Haber's planned technological infrastructure has previously been supported by a number of studies conducted by others in the 1990s with the development of market by applying rejected cryptographic digital signing methods to a financial market. In Nakamoto's article, he says: In the literature, this system, which is suited to cryptocurrencies, is referred to as blockchain sees. Today, there are over 500 cryptocurrencies traded on cryptocurrency exchanges. All cryptocurrencies, with a few exceptions, exist alongside currencies. It makes use of blockchain infrastructure in many forms.

The current allocation of resources effectively among the members of the monetary system capacity is one of the most important elements in the formation of cryptocurrencies (Maurer, Nelms, & Swartz, 2013). of the research, Bitcoin's book was published in 2008, during a time when the globe was dealing with financial crisis.

As a result, it is seen as a viable alternative to the existing financial system. Beyond Cryptocurrencies, on the other hand, accomplish what the current financial system cannot; how will he succeed?

Stock and cryptocurrency market

The stock market is really the "location" where businesses sell their bonds and shares in exchange for money and interest from investors. Investors, on the other hand, put together a portfolio of stocks in order to profit. The Securities Exchange Commission is the regulatory organization that oversees a whole stock market. Similarly, stocks in cryptocurrencies do not exist in material form and instead run on a network. The value of stocks is determined by the company's financial situation, as well as the country's economic and political difficulties, and the value of cryptocurrencies is determined in the same way. Owning a share, on the other hand, makes investors feel safer than owning Bitcoin. Because you will conduct research and attempt to contact businesses with good management, reputation, and financial standing.

It gives investors a sense of security when it comes to their money. On the other hand, the presence about certain regulatory bodies, regulations, and requirements for listed businesses, as well as the absence of major market shocks (with the exception of the 2011 shock), make the stock market appealing. It's also worth noting that the price of shares isn't as volatile as the price of Bitcoin. The bitcoin market has more volatility than the stock market.

Payments and other financial services will become cheaper, faster, and more accessible as a result of technological advancements, and they will be able to flow freely across borders. Crypto asset technology has the potential to make cross-border payments faster

and cheaper. Decentralized finance has the potential to develop into a framework for more inventive, inclusive, and visible financial services.

Despite the potential benefits, the rapid rise and adoption of digital currencies constitute a threat to financial stability. This chapter examines the ramifications of the crypto ecosystem's growth and assesses the risks to financial stability that come with it. Greater use of digital currencies has some advantages for emerging market economies countries, but it also has macro-financial dangers, particularly in terms of asset and currency replacement, which is referred to as cryptoization in this chapter. The chapter finishes with a set of eight policy recommendations that can be implemented immediately Online Annex 2.1 includes a brief summary of the classification of crypto assets and also a tutorial just on crypto ecosystem for readers who are unfamiliar with the language and developments. Many crucial concerns relating to regulatory frameworks for digital money and crypto assets have been examined at length by the IMF. IMF (2020a) and IMF (2021), as well as a study of financial integrity challenges, cover certain themes not treated in depth in this chapter. Despite severe price fluctuation, the market valuation of cryptocurrencies has increased significantly. In 2021, the market capitalization nearly tripled from an all high of \$2.5 trillion by early May. This was matched by a 40% drop in May, as institutional investors' concerns about crypto assets' environmental impact deepened, and worldwide regulatory monitoring of the crypto ecosystem intensified. The severe drops in May were likely worsened by heavy leverage, which resulted in exchanges automatically liquidating margin and futures holdings. Since then, the market price of crypto assets has risen to even more than \$2 trillion, representing a year-to-date increase of 170 percent at the time of this writing.

For example, Bitcoin's risk-adjusted returns over the last year are comparable to those of greater technology stocks or the S&P 500. Investors, on the other hand, are subject to bigger losses. When compared to other asset classes that have had big downturns, such as domestic currency bonds and stocks in some emergent market and

developing economies with weak fundamentals, the relative attractiveness of these cryptocurrencies returns can be higher. Although this is true to some extent, under recent market turmoil, the link between these digital currencies and some key asset classes strengthened dramatically. If institutional holders who are impacted by common variables continue to participate, the diversification effect may diminish with time. Increased investor interest in stablecoins, newer technologies such as Ethereum, other "smart contract" blockchains, and decentralized finance are all contributing to an increase in market capitalization.

Stablecoins: In 2021, their market value has more than doubled to more than \$121 billion. Tether is the most popular stablecoin, although its market share has dwindled as big centralized cryptocurrency exchanges have launched their own versions. Because stablecoins are extremely useable for settlements of derivatives and spot trades on exchanges, their trading volumes outstrip those of all other cryptocurrency transactions. The top stablecoins' price stability is improving, as evidenced by decreasing price discrepancies from the desired 1:1 equilibrium with the major currencies in 2021. Users have been protected from the instability of other crypto assets by their relative price stability, which means they do not need to shift their resources outside of the crypto ecosystem.

Ethereum and other “smart contract” blockchains: Bitcoin is still the most popular cryptocurrency, but its market share has dropped from more than 70% in 2017 to less than 45% in 2021.

Newer blockchains that use payment systems have sparked interest in the market, with the goal of addressing the difficulties of previous blockchains by incorporating features that ensure durability, integration, and sustainability. The most well-known is Ether, which in 2021 eclipsed Bitcoin in terms of trading volume.

The Financial Stability Board (FSB) found in October 2018 that crypto assets did not constitute a major danger to world's economic stability, but it identified various

transmission mechanisms that may change that conclusion. Risks resulting from market capitalization, investor confidence impacts, risks arising from indirect and direct exposures of financial companies, and risks arising from the usage of crypto assets for payment and settlements are among these channels.

Some of these routes have developed significantly since then, and new routes of exposure have emerged.

Market capitalisation has increased by a factor of ten, putting it on par with other established asset classes (such as US high-yield bonds). However, in comparison to governmental stocks and bonds markets in large sophisticated economies, it is still modest. Despite huge changes in crypto asset valuations, episodes of loss of trust in crypto assets have produced modest spillover effects to broader markets so far.

So far, the effects of failures of crypto asset issuers on confidence have been minimal.

Nevertheless, their importance is growing as trading volumes on some countries' exchanges have risen considerably and are now similar to those on their domestic stock exchanges in some circumstances.

The banking system's exposure to crypto assets is increasing, though from a minimal basis. Some nonbank institutions, most prominently hedge funds, look to be increasing their exposures at a quicker rate, which could lead to larger banking system indirect exposures.

With some exclusions (see "Cryptoization"), the use of cryptocurrencies for settlements and payments is still limited. Given that some global payment providers have only lately begun to interface with the crypto environment, particularly stablecoins, this channel has the potential to grow quickly.

The inventions that already have give way to the crypto ecosystem are substantial and have the potential to provide tangible advantages to countries, but the dangers must be managed. Financial stability risks appear to be managed at the global level for the time being, but the macro-criticality of crypto assets, particularly stablecoins, can be

much higher in some emerging market and developing nations where adoption has been quick.

The following sections are devoted to the following topics:

1. operational risks, market self respect, data availability, and pass activities in the crypto ecosystem;
2. stablecoin-specific issues related to their design, use, and domestic and global regulation and supervision;
3. macro-financial transient stability including cryptoization, which are more prevalent in emerging economy and developing economies.

Bitcoin issuance mechanism

Being a form of virtual currency that is created and controlled via cryptographic technologies. The accounting for Bitcoin is done in a decentralized manner, and its use is governed by a limitation system. The information regarding the transaction is usually not encrypted and can be made public. The database of the chain of operations' stability is ensured by a cryptographic element.

The legal and economic status of bitcoin at the moment.

The essence of the matter is being debated. Depending on the country, Bitcoins, which are a form of payment, are regarded a unique product, with circulation restrictions (for example, with bitcoins in credit institutions bans on foreign exchange transactions).

The following are some of the methods used to create bitcoins: mining, forging or ICO.

Bitcoin's popularity is growing by the day, and even the most common digital account units in large banks are just one step away from being used. As a result, various impossibility of management impediments exist in the CIS countries and cash flows moving across the world for Europe. The Bank of England's Central Statement on Bitcoin's Growing Popularity, in particular. Inflation is out of control for the central

bank. This concept is also supported by other financial institutions. Having a virtual currency in Russia and the Commonwealth of Independent States. Bitcoin's status has yet to be determined. As a result, its usage is neither explicitly approved nor forbidden. The inability to regulate the economic situation during the release and the ineffectiveness of economic forecasts, as well as the decentralization of this currency and its lack of an institution that can govern the flow, are all linked to the bitcoin being formally un circulation. The mechanism is activated using complicated mathematical calculations.

Bitcoin contains a reverse emission function, which provides anonymity, no commission, easy usability, high price fluctuation, and other benefits. The release of units into circulation is traditionally the issue of fresh money.

By regulating the Bitcoin system's monetary basis.

There is a centralized system in place to deal with. Its primary function is to prevent against the human factor's interference in emissions by implementing procedures. The following functions are performed by the entire production process, which is regulated by a cryptographic algorithm:

- Defining the term refers to the amount of money spent and the number of times it occurs.

- Coins that do not follow the central office's guidelines in order to avoid attempts to increase the number. The Bitcoin exchange rate is determined by supply and demand, as well as a man-made money supply to alter the quotation.

What exactly is Bitcoin issuance, and what are the ramifications?

- Cryptocurrencies When a user discovers a new block, it is released. These blocks are 1 MB in size and consist of 10-15 transactions created in minutes (1 to 6 hours). The essence of coins issued in one block is a decline in geometric progress: by four times 50 percent at each consecutive time interval. The algorithm is separated into graphs with precision.

The Bitcoin system is based on people's faith in it. This money is used in circulation if there is a demand for it and people believe in it.

Furthermore, the bitcoin system's security is based on, and the collecting of money is secure here. The number of active Bitcoin currency users is determined by the number of users. If it is held, the value increases based on the number of transactions made. About It should be mentioned that the bitcoin sector experienced a price bubble a few years ago. Speculation can cost as much as \$1,200 in cryptocurrency. When the purchase is completed, the price bubble bursts and the exchange rate plummets. Bitcoin is currently on the rise. This is due to a high level of demand among customers.

Bitcoin is distinguished from other payment methods and can be invested in.

The following are some of the benefits of speculation:

1. Fixed emission - it is impossible to control it from the outside;
2. Price fluctuation - that is, the currency is both economic and political, and it is determined by supply and demand.

Bitcoins are not without risk. The reliability of bitcoin exchange services is the source of danger here. This year, the price of Bitcoin, gold, stock market indices, and investment instruments such as real estate have all soared by more than 500 percent. A monetary system has been established, according to the World Economic Forum's (WEF, WEF) "Blockchain Potential Difference" report, which refers to the global economic crisis in 2008 and was e-mailed by a person named Satoshi Nakamoto. "Digital money" and "cryptocurrency" are other terms for the same thing. The primary distinction between virtual money and regular money is that virtual money is not controlled by governments.

The primary difference between traditional money and virtual money is that virtual money is not managed by governments. It is also known as "digital money" or "cryptocurrency." According to the article, there are approximately 900 virtual currencies in use around the world. Bitcoin is the most valuable of them all, with a market capitalization of about \$ 106 billion. Bitcoin has increased by more than 500%

this year, outpacing financial products such as gold, stock markets, and real estate. With a market capitalization of \$ 29.2 billion, Bitcoin is followed by Ripple, which has a market capitalization of \$ 7.8 billion. Virtual money was previously employed by countries such as China, Russia, and Vietnam. The devaluation of virtual money was caused by these steps, which included the creation of some rules and the imposition of various limits. The biggest stock exchanges operator, the US company CME Group, last traded with Bitcoin in the fourth quarter of this year, and it expects to resume futures trades, but it claimed it needed to wait for regulators' approval. Following the news, Bitcoin increased by 5%.

Some people may believe that Bitcoin is really the only usable coin available just because it controls over half of the market. However, there are a number of valid counter-arguments to the claim. To begin with, Bitcoin is among the world's earliest cryptocurrencies, giving it a competitive advantage. Furthermore, most currencies are addressing use cases and issues that Bitcoin is not attempting to solve. The cryptocurrency market is a decentralized, free market in which no single entity wields autonomous power. Bitcoin's value might plummet inside a matter of a few seconds. Outside of over a thousand cryptocurrencies on the market, the list below illustrates the various functionalities of 10 of them.

Table 7: Market Capitalization and Functions of a few Cryptocurrencies

Cryptocurrency	Market Cap (June 2020)	Purpose
Bitcoin	\$177,027,763,509	It is primarily used to trade other cryptocurrencies. Major trading platforms accept it. Bitcoin is accepted by a large number of businesses. Used in initial coin offerings (ICOs) for applications that aren't created just on Ethereum platform.
Ethereum	\$27,099,348,355	ICOs for decentralised application developed just on Ethereum platform are the most common use cases. Ethereum trading is only available on a few exchanges.

Ripple	\$8,347,445,172	Ripple collaborates with banks to change the way they transmit money around the world, which is a critical step in today's fast-paced economy.
Litecoin	\$2,857,047,342	This coin, like bitcoin, is widely accepted as a means of payment by numerous businesses throughout the world.
Ethereum Classic	\$737,447,770	Ethereum Classic is indeed a decentralized system that executes smart contracts, which are programs that run exactly as they are written with no downtime, fraud, censorship or third-party interference. Ethereum Classic is the classic form of the Ethereum blockchain, which preserves untampered history and is devoid of external influence and subjective transaction tampering.
Dash	\$688,690,141	Dash (DASH) is a decentralized, privacy-focused digital currency that allows for quick transactions. It enables us to keep your financial information private while making transactions that are faster than cash.
IOTA	\$639,734,252	As the Internet of Things grows, the requirement for interoperability and resource sharing becomes increasingly important. IOTA allows businesses to experiment with new business-to-business models by turning every technology resource into a possible service that can be transferred in real time on an open market with no fees. It's the newest money on the street, with no transaction fees to speak of.
Bitshares	\$70,955,165	The Openledger Trading platform also uses Bitshares as a currency. Unlike Poloniex or other large exchanges, this is the sole decentralized trading platform. It is based on graphite technology and is a simple platform to utilize. Chinese investors are expected to use them for initial coin offerings (ICOs) in the near future.
Siacoin	\$143,577,274	Sia is a brand-new cloud storage platform. Rather to having a single firm control and maintain all datacenters, Sia opens the way and lets anyone to generate rented out their hdd. Redundancy and cryptography are used to ensure data integrity.

Monero	\$1,162,639,232	Monero is an untraceable, safe, and private cryptocurrency. It's open-source software that anyone can use. You become your own bank with Monero. Your finances are under your own control and responsibility, and transactions and your accounts are kept confidential from prying eyes. Monero is built on the CryptoNote system, although it differs from it in terms of blockchain obfuscation algorithmically.
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Source: Author's survey results

A few points are highlighted in the table above. Some cryptocurrencies, such as BitCoin and LiteCoin, perform comparable activities and can be considered interchangeable, whilst others, such as Ethereum, Ethereum Classic, Dash, and others, perform similar duties but have different communication protocols and USPs, and hence can be used for different purposes. SiaCoin, IOTA, and other cryptocurrencies, on the other hand, serve entirely different purposes than most cryptocurrencies. It is therefore correct to conclude that, despite the likelihood of a crowded sellers' market, most cryptocurrencies get their own distinctive function, and hence a majority of them cannot be considered perfect substitutes for one another. This will not bring to a crowded market, in my opinion, until cryptocurrencies become commonplace.

3.2. The positive and negative impacts of cryptocurrency on the stability of financial system

Cryptocurrencies have both benefits and drawbacks. As a result of this some governments use virtual currency lawfully, while others use virtual currency illegally. Use of such money is prohibited. The positive and negative aspects of cryptocurrencies in general.

Advantage

Using cryptocurrencies has numerous advantages. Transactions, for example, are quick and inexpensive in terms of operating costs, and nations cannot take them because they are not reliant on central governments. There is no way to cancel or reverse the transaction, and no one can access or disclose your payment information. Because of the blockchain, cryptocurrencies are easier to transport and do not pose a security risk; there is no need for a bank to store them; it is a currency in which the user is the sole owner. Without the use of intermediaries or trust, it is feasible to transact using cryptocurrencies. These transactions are transparent and visible in real time. Furthermore, the risk of inflation remains low in cryptocurrencies; inflation is characterized by an increase in the circulation real money supply, that is not the situation in cryptocurrencies. When compared to traditional money, the chance of bitcoin collapsing is less. While governments' hyperinflation causes real currencies to fail, cryptocurrencies are not controlled by a central authority. While traditional money is responsible for the security of physical money, cryptography is responsible for the verification of electronic money transactions as well as the protection of secrecy and data integrity (encryption). Electronic money does not need to be physically transferred, and remote payments are simple to make.

In an essence, cryptocurrencies provide advantages to users over traditional currencies. The following are some of the benefits of cryptocurrencies:

- ✓ Cryptocurrencies are essentially independent of traditional financial institutions and operate beyond national borders. As a result, many users are going above and beyond the current legislative framework.

- ✓ When trading cryptocurrencies, there is no requirement for big transactions to be disclosed, reported, or investigated. There is no difference between sending money to Arkansas or Afghanistan, regardless of where it comes from.

- ✓ Furthermore, users can only be recognized by their virtual memory in the system. Users must connect their cryptocurrencies addresses to a traditional bank

account, according to cryptocurrency brokers. It is, however, impossible to utilize bitcoins without first registering with one of these brokers.

✓ Individuals can send or receive cryptocurrency without ever revealing their physical identities. As a result, cryptocurrencies can be said to provide non-fake exchange.

✓ Cryptocurrencies are managed over a distributed system, with no single point of failure. The amount of processing power a user provides to the system determines their relative importance, and no one user is mandatory for operation.

In conclusion, Bitcoin is used in a fully centralized environment with no single point of trusted, and the double spending is not conceivable. Individuals can contribute to the Bitcoin ecosystem since it has been skillfully constructed. The Bitcoin supply of money is expected to grow steadily and reliably. It is possible to split and exchange bitcoins. It's transparent and well-designed. In the coming years, the Bitcoin structure will allow for the development of various financial contracts and mechanisms. Bitcoin transactions are irreversible, resulting in a variety of security advantages. Transaction fees are extremely low, which is a significant benefit, particularly when sending money internationally.

Disadvantages

One of the most significant disadvantages is the system's lack of adoption; while many private enterprises recognize crypto currency, many institutes do not trust it and hence do not use it in transactions. Because cryptocurrencies are used at a much lower rate than real money, the amount of cryptocurrencies and the number of minor events might fluctuate relatively little. As a result, it's hard for cryptocurrencies users to spot their own patterns. Because no government completely acknowledges cryptocurrencies, finding a legal mediator for the issues that occur is impossible. Furthermore, due to rapid upgrades on the electronic channels where cryptocurrencies are processed, people do not constantly watch the system and platforms. The greatest risk of strong passwords is that states will likely outlaw money in this system because it is open to currency

exchanges. The realization of this circumstance may result in the money being lost or even rendered useless. Financial institutions, such as banks, are also becoming government tax pioneers. The government is putting more pressure on financial firms to give any information on customer accounts that excludes bank account taxes and taxes collected by tax agencies around the world.

Crypto currency earnings are not taxed, and the confidentiality of taxpayers prevents them from obtaining information about them. For states, this is a disadvantage. Governments, on the other hand, are unable to learn about foreign tax evasion because cryptocurrencies are not associated with financial institutions. In this context, as cryptocurrencies gain in popularity, tax evaders may find cryptocurrencies to be more successful than traditional tax avoidance methods such as using offshore accounts designated tax havens. Because crypto money is anonymous and untraceable, states are unable to levy any punishments on it.

However, one of the disadvantages of cryptocurrency is that some governments wish to take steps to limit or prohibit their use. The following are some of the disadvantages of cryptocurrencies:

- ✓ Cryptocurrencies make it impossible for a government to carry out its responsibilities, such as setting raising revenue or monetary policy.

- ✓ If the parties involved in the contract participate in unlawful activities, traditional financial accounts might be frozen. On traditional networks, payments are reversible. In the real world, conventional account holders are simple to spot. Accounts cannot be frozen in crypto money systems, transactions cannot be annulled, and bank customers are difficult to identify. As a result, cryptocurrency can be utilized to conduct unlawful business.

- ✓ Similarly, there are over 50 well-known gambling websites that accept cryptocurrency payments and payments. People can send a bet to a specific address that relates to a number between 1 and 64,000 on the most popular of these sites.

✓ Some believe that, in addition to drug and gambling, cryptocurrencies could be a useful instrument for terrorist financing.

CONCLUSION AND RECOMMENDATIONS

Cryptocurrencies are digital assets that are decentralized and have taken the globe by storm. However, they are incompletely defined as financial instruments, and an overall low awareness has impeded their widespread adoption. The finer points of how cryptocurrencies work, as well as the opportunities and downsides they bring for everyone, were examined. The following are the major factors that may be deduced from the study:

Transformation of the socio-economic environment

Cryptocurrencies can protect assets against depreciation in the event of a conflict or the collapse of a government. Governments have no influence over cryptocurrencies since they are decentralized assets, and the blockchain assures that they remain secure regardless of the political situation. According to a recent World Economic Forum report, approximately 10% of global GDP will be kept on blockchain or blockchain-connected technologies by 2025.

Alternatives to fiat currencies

Only when cryptocurrencies are linked with fiat currency can they be described as volatile. When contrasted to other cryptocurrencies, though, much of this volatility disappears.

Increasing investor interest

In 2020, the market capitalization of cryptocurrencies will have surpassed \$250 billion. While it took them seven years to reach \$25 billion, their ascent to \$250 billion has already been lightning fast.

Security

Cryptocurrencies are said to be far more secure than traditional fiat currencies, as they are immune to counterfeiting and duplication thanks to the blockchain. Offline wallets are still more safe than traditional savings systems.

Lack of awareness and uncertainty

Because cryptocurrencies are such a new technology, there seems to be a lack of knowledge and understanding about them. Despite the fact that cryptocurrencies are significantly more secure than traditional currencies, there is a recurring worry of the system crashing and individuals losing their investments.

The world of finance has reached a stage where taking one step farther is a whole different experience. Many IT programmers, economists, finance specialists, speculators, and enterprises may be drawn to this new growing industry. They were increasingly interested in crypto forms of money as a result of their enthusiasm, and the value increased as a result. The crypto money market is currently worth billions of dollars, despite the fact that it lacks the physical properties of gold, silver, and any other precious metal. Because there is no centralized issuing authority or regulating organization to track transactions, Digital currencies are completely reliant on network users. Traditional financial system difficulties such as double spending, counterfeit money, and cyberattacks are limited by digital forms of money due to the cryptographic method used. Despite the fact that it is safer than traditional financial systems, hundreds of people have lost BTCs valued millions of dollars. Trade with this modern digital money puts people at danger, according to a survey by Ars Technica (a source of technology news and scientific approaches). As a result, in order to avoid becoming a victim of electronic money, it is vital to assess dangers and get understanding of the crypto currency sector before diving into this pool.

In this research report, it is also emphasized that the cryptocurrency system prevents double spending. Due to the fact that traditional accounting systems work on the idea that payments are recorded on the balance sheet, the quantity of debt rises even when there is no money on account. However, with cryptocurrencies, you can only send the sum of money that is in a person's account. The distinctions and relationships between banks and the new virtual currency system are also brought up. While bankers are rewarded with interest on their loans and fees from transactions, miners are rewarded with Bitcoin and small fees. Big firms, banks, and governments must take

concrete steps to implement Blockchain technology. The world's countries should keep up with modern-day technology. Blockchain is used not only for cryptocurrency, but also for electronic agreements (smart contracts), which eliminates flaws and failures between parties, as well as the sale of music, movies, and games, which prevents piracy - labor theft. To encourage individuals to utilize blockchain, singers, artists, or businesses can use peer-to-peer technology to sell their goods or services.

It's nearly impossible to shut down Bitcoin. Because prohibiting cryptocurrencies is akin to prohibiting internet use, which is absurd even in its imagining. As a result, the only thing that governments can do is build a legal framework. Despite the existence of numerous studies and guidelines, as well as AML (Anti Money Laundering) and KML (Know Your Customer) rules on Bitcoin exchanges, there is just no consistent law on currencies as of yet. It is vital to enact legislation in order to safeguard citizens from fraud and to stabilize the impacts of cryptocurrency on the financial sector. It is necessary to educate individuals about cryptocurrency trading in order to avoid losses and failures, as well as to reduce vulnerability to hazards. Creating teams and relevant programs for relevant parties for educational and advisory purposes by private companies or governments is a step that must be taken slowly.

While cryptocurrencies can limit the risk of well-diversified cash portfolios, not all currencies can do so during the run-up before and during the COVID-19 financial crisis, according to these findings. The literature, on the other hand, focuses primarily on Bitcoin, with some indications that bitcoins can efficiently diversify cash holdings in the event of extreme events, while gold likely to have more steady diversification capabilities than Bitcoin. In contrast, we discover that Gold did not effectively manage risk during the COVID-19 financial crisis, and that there were higher functioning altcoins than Bitcoin. The design of a cryptocurrency may have a role in the diversity in diversion efficacy.

REFERENCES

In Azerbaijani:

1. Məmmədov Zahid. ``Bitcoinin emissiya mexanizmi``, UNEC EKSPERT, ``Kriptoalyuta``, 2017, səh.10
2. Əliyev Ümüdvar. `` Kriptoalyutalar yığım vasitəsi ola bilərmi?``, UNEC EKSPERT, ``Kriptoalyuta``, 2017, səh.20

In English:

1. Alexander C., Dakos M. A critical investigation of cryptocurrency data and analysis. *Quant. Finance*. 2020
2. Alexander, C., Choi, J., Park, H., & Sohn, S. (2020). BitMEX Bitcoin derivatives: Price discovery, informational efficiency, and hedging effectiveness. *Journal of Futures Markets*, 40(1), 23-43.
3. Ashraf, B.N. 2020. Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance* 54 (2020)
4. Beneki, C., Koullis, A., Kyriazis, N. & Papadamou, S. 2019. Investigating volatility transmission and hedging properties between Bitcoin and Ethereum. *Research in International Business and Finance* 48 (2019) 219- 227
5. Baur, D.G & Hoang, L.T. 2021. A crypto safe haven against Bitcoin. *Finance Research Letters* 38 (2021)
6. Bakas D, Triantafyllou A. Commodity price volatility and the economic uncertainty of pandemics. *Econ Lett.* (2020)
7. Belu, M. (2019). Application of Blockchain in international trade: An overview. *The Romanian Economic Journal* XXII(7): 2–16.
8. Baur, D. G., & Dimpfl, T. (2019). Price discovery in bitcoin spot or futures? *Journal of Futures Markets*, 39(7), 803-817.

9. Bouri, E., Molnár, P., Azzi, G., Roubaud, D. and Hagfors, L.I. (2017), “On the hedge and safe haven properties of Bitcoin: is it really more than a diversifier?”
10. Böhme, R., Christin, N., Edelman, B., & Moore, T. (2015). Bitcoin: Economics, technology, and governance. *Journal of Economic Perspectives*, 29(2), 213-238.
11. Corbet S., Larkin C., Lucey B. The contagion effects of the COVID-19 pandemic: evidence from gold and cryptocurrencies. *Finance Res Lett.* (2020)
12. Conlon T., McGee R. Betting on bitcoin: does gambling volume on the blockchain explain bitcoin price changes? *Econ. Lett.* 2019
13. Evidence from Bitcoin and Altcoin Markets. *Journal of International Financial Markets, Institutions and Money*, 52, 173-195.
14. Goodell JW, Goutte S. Co-movement of COVID-19 and Bitcoin: evidence from wavelet coherence analysis. *Finance Res Lett.* (2021)
15. Huang Y, Duan K, Mishra T. Is Bitcoin really more than a diversifier? A pre-and post-COVID-19 analysis. *Finance Res Lett.* (2021)
16. He, Z., O’Connor, F., & Thijssen, J. (2018). Is gold a sometime safe haven or an always hedge for equity investors? A Markov-Switching CAPM approach for US and UK stock indices. *International Review of Financial Analysis*, 60, 30–37.
17. Ji Q, Zhang D, Zhao Y. Searching for safe-haven assets during the COVID-19 pandemic. *Int Rev Finan Anal.* (2020)
18. Liu YC, Kuo RL, Shih SR. COVID-19: the first documented coronavirus pandemic in history. *Biomed J.* (2020)
19. Mensi, W., Al-Yahyaee, K.H., Al-Jarrah, I.M.W., Vo, X.V. & Kang, S.H. 2020. Dynamic volatility transmission and portfolio management across major cryptocurrencies: Evidence from hourly data. *The North American Journal of Economics and Finance* 54 (2020)
20. Mariana CD, Ekaputra IA, Husodo ZA. Are Bitcoin and Ethereum safehavens for stocks during the COVID-19 pandemic?. *Finance Res Lett.* (2021)

21. Nadler, P. & Guo, Y. 2020. The fair value of a token: How do markets price cryptocurrencies? *Research in International Business and Finance* 52 (2020)
22. Qian X, Qiu S, Zhang G. The impact of COVID-19 on housing price: evidence from China. *Finance Res Lett.* (2021).
23. Shahzad, S.J.H., Bouri, E., Roubaud, D. & Kristoufek, L. 2020. Safe haven, hedge and diversification for G7 stock markets: Gold versus bitcoin. *Economic Modelling* 87 (2020) 212–22
24. Sebastiao, H., & Godinho, P. (2019). Bitcoin futures: An effective tool for hedging cryptocurrencies. *Finance Research Letters*, 33
25. Satoshi Nakamoto, Bitcoin White Paper, ``Bitcoin: A Peer-to-Peer Electronic Cash System``, 2008
26. Vliet, B.V. 2018. An alternative model of Metcalfe's Law for valuing Bitcoin. *Economic Letters* 165 (2018) 70-72
27. Wang, G., Tang, Y., Xie, C. & Chen, S. 2019. Is bitcoin a safe haven or a hedging asset? Evidence from China. *Journal of Management Science and Engineering* 4 (2019) 173-188 International trade of Azerbaijan. Statistical summary. B.: 2020.
28. Zhu P, Zhang X, Wu Y, Zheng H, Zhang Y. Investor attention and cryptocurrency: evidence from the Bitcoin market. *PLoS ONE.* (2021)
29. Zhao LT, Meng Y, Zhang YJ, Li YT. The optimal hedge strategy of crude oil spot and futures markets: evidence from a novel method. *Int J Finance Econ.* (2019) 24:186–203.

In Turkish:

1. Aslan, A. (2018). *Kripto Para Olgusu Ve Blockchain Teknolojisi: Ekonomik Aktörlerin Tepkisi, Maliyet Analizi, VAR Modeli Ve Granger Nedensellik Testi.* Master's thesis, Hacettepe Üniversitesi. Sosyal Bilimler Enstitüsü. Ankara. 1-109.
2. Atik, M., Köse, Y., Yılmaz, B., & Sağlam, F. (2015). Kripto para: Bitcoin ve döviz kurları üzerine etkileri. *Bartın Üniversitesi İİBF Dergisi*, 6(11), 247-261.

3. Çetiner, M. (2018). Bitcoin (Kripto Para) Ve Blok Zincirin Yeni Dünyaya Getirdikleri. *Istanbul Journal of Social Science*. Issue 20: 1-16.

Internet Resources

1. Digital money
<https://corporatefinanceinstitute.com/resources/knowledge/other/digital-money/>
2. The most important cryptocurrencies, <https://www.investopedia.com/tech/most-important-cryptocurrencies-other-than-bitcoin/>
3. National Digital Currencies: The Future of Money?
<https://www.belfercenter.org/publication/national-digital-currencies-future-money>
4. <https://coinmarketcap.com/>

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