INCREASING INTEREST IN CRYPTOCURRENCIES IN ADVANCED AND DEVELOPING COUNTRIES: CASE OF TURKEY

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ABSTRACT

INCREASING INTEREST IN CRYPTOCURRENCIES IN ADVANCED AND DEVELOPING COUNTRIES: CASE OF TURKEY

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This thesis analyzes cryptocurrency adoption in Turkey by using structural equation modeling (SEM). Cryptocurrencies are one of the most novel topics in economics and it is aimed to understand the underlying reasons why people tend to use cryptocurrencies in Turkey. While analyzing cryptocurrency adoption in Turkey, it is attempted to provide comprehensive information about the evolution of cryptocurrencies worldwide and make a comparison between advanced and developing countries. People in advanced countries do not show interest in cryptocurrencies as much as in developing countries in favor of the existence of a strong economy. On the other hand, High levels of unemployment, inflation, and currency depreciation cause a higher interest in cryptocurrencies in developing countries. People approach cryptocurrencies as an alternative tool to protect their savings and gain far too much profit than conventional investments in developing countries. Six hypotheses are created to investigate the reasons for cryptocurrency use in Turkey, and three of the hypotheses were found statistically significant. High level of inflation, high level of volatility in the foreign exchange rate, and absence of tax

implementation are the most common reasons underlying participants' use of cryptocurrency in Turkey. Volatility in the price of cryptocurrencies and the risk of financial loss are the main reasons for people to stop using cryptocurrencies. It is concluded that if certain conditions are satisfied like an increase in the regulation level of cryptocurrencies, non-users could start to use them.

Keywords: Cryptocurrency, cryptocurrency adoption in Turkey, structural equation modeling (SEM) analysis.

ÖZ

GELİŞMİŞ VE GELİŞMEKTE OLAN ÜLKELERDE KRİPTO PARA BİRİMLERİNE ARTAN İLGİ: TÜRKİYE ÖRNEĞİ

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Bu tez, yapısal eşitlik modellemesi (SEM) kullanarak Türkiye'de kripto paraların benimsenmesini analiz etmektedir. Kripto paralar iktisat alanındaki en yeni konulardan biridir ve bu tezde Türkiye'de insanların kripto para kullanma eğiliminin altında yatan nedenlerin anlaşılması amaçlanmaktadır. Türkiye'de kripto paranın benimsenmesi analiz edilirken, kripto para birimlerinin dünya çapındaki gelişimi hakkında kapsamlı bilgi verilmeye ve gelişmiş ve gelişmekte olan ülkeler arasında bir karşılaştırma yapılmaya çalışılmıştır. Gelişmiş ülkelerdeki güçlü ekonomik yapı bireylerin kripto paraya olan ilgisini azaltıcı yönde etkilemektedir. Yüksek düzeyde işsizlik, yüksek enflasyon ve para biriminin değer kaybetmesi, gelişmekte olan ülkelerde kripto para birimlerine daha fazla ilgi gösterilmesine neden olmaktadır. Gelişmekte olan ülkelerde, insanlar tasarruflarını korumak ve geleneksel yatırımlardan çok daha fazla kar elde etmek için kripto para birimlerine alternatif bir araç olarak yaklaşmaktadır. Türkiye'de kripto para kullanımının nedenlerini araştırmak için altı hipotez oluşturulmuş ve hipotezlerden üçü istatistiksel olarak anlamlı bulunmuştur. Türkiye'de kripto para kullanımını en çok etkileyen unsurların, yüksek enflasyon,

kripto para kullanımının herhangi bir vergiye tabi olmaması ve döviz kurundaki oynaklık olduğu sonucuna ulaşılmıştır. Kripto paraların fiyatlarındaki oynaklık ve kripto para kullanımından kaynaklanan para kaybı, insanların kripto paraları kullanmayı bırakmasının ana nedenleridir. Kripto paraların regülasyon seviyesindeki artış gibi belirli koşulların sağlanması durumunda, kripto para kullanmayanların kripto paraları kullanmaya başlayabilecekleri sonucuna varılmıştır.

Anahtar Kelimeler: Kripto para, Türkiye'de kripto para adaptasyonu, yapısal eşitlik modellemesi (SEM).

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CHAPTER 1

INTRODCUTION

1.1. Motivation for Research

Cryptocurrencies have drawn the attention of individuals and institutions since the invention of bitcoin, which is the first decentralized cryptocurrency (Nakamoto,2008). Cryptocurrencies have created a big industry which affected the economic system all around the world. The technology behind cryptocurrencies constitutes opportunities that can change the financial system at both domestic and international levels. On the other hand, with its structure of being a decentralized system, cryptocurrencies constitute problems such as money laundering. Furthermore, being a decentralized system makes it inconvenient in terms of credibility. Even though cryptocurrencies have some inherent obstacles, they spread worldwide, especially during the last four-five years. Especially during the covid-19 period, the cryptocurrency ecosystem aroused interest from people enormously.[1] Increasing interest in cryptocurrencies affected the economic system in various aspects. One of the latest incidents that affect the economic system is the collapse of a cryptocurrency exchange named FTX. After the collapse of FTX, customers have withdrawn 6 billion U.S. dollars within three days which is a type of bank run. After the collapse, many people could not withdraw their money, and it is reported that about 12 billion U.S. dollars are needed for debt payment[2]. Especially beginning from May 2021, the cryptocurrency market has been shaken and the collapse of cryptocurrency exchanges such as FTX contributed to the idea that cryptocurrencies are vulnerable and highly speculative financial assets. The

[1] Number of cryptocurrency users, cryptocurrencies, and exchanges increased during the covid-19 pandemic period. Specific numbers and comparison of interest on cryptocurrencies provided in the next chapters.

[2] https://www.theguardian.com/technology/2022/nov/10/what-happened-to-ftx-and-could-crisis-spill-over-to-rest-of-crypto

result of the analysis in this thesis supports that idea. It is resulted that people starting to use cryptocurrencies due to the high level of inflation and reduce in purchasing power in Turkey. Only a small portion of cryptocurrency investors in Turkey profited a significant amount of money from cryptocurrency investment. On the other hand, a considerable amount of people who think that they will gain a high level of profit by investing in cryptocurrencies lost a significant amount of money.

Firstly, the total market capitalization of cryptocurrencies reached over 2,4 trillion U.S Dollars in May 2021, which is more than Apple's market capitalization, the largest company by market capitalization in the world with a value of 2,1 trillion U.S dollars. The total market capitalization of cryptocurrencies was 120 billion U.S. dollars in February 2019 and reached 20 times during the next two years.[3] The growing interest in cryptocurrencies arises from both individual users and trading firms. There are many reasons for the growing interest in cryptocurrencies, such as the acceptance of cryptocurrencies as a payment method by big firms, providing low costs with their structure, and the opportunity to gain wealth with high price volatility. For example, Elon Musk announced on Twitter that bitcoin could be used as a payment method for buying Tesla, and bitcoin price rose about 5% in March 2021 and made another tweet about the suspension of bitcoin as a payment method, and the price of bitcoin fell more than 10% in May 2021.[4] Such volatility in the price of bitcoin and other cryptocurrencies due to the effect of acceptance by big firms makes it an attraction point to gain wealth.

Secondly, regulatory institutions such as central banks also pay attention to cryptocurrencies and their effects on the countries' economies. The decentralized structure of cryptocurrencies aims to preclude third-party trusted institutions such as central banks.

[3] Data of the market capitalization of Apple sourced from https://companiesmarketcap.com/, and data of the total market capitalization of cryptocurrencies sourced from https://www.coingecko.com/en/global_charts .

[4] Price of bitcoin available at https://www.coindesk.com/price/bitcoin , and tweets of Elon Musk are available at https://twitter.com/elonmusk .

Cryptocurrencies can be used as a tool for a medium of exchange, which corresponds to countries' fiat money. Also, cryptocurrencies provide a service for making international transactions at a low cost. Being an alternative to fiat currencies constitutes a local-level risk to the central banks, and cryptocurrencies' easiness to making transactions faster with lower cost constitutes a potential for being alternative reserve money.

After the spread of cryptocurrencies worldwide, some central banks took action on cryptocurrencies. Some governments announced warnings about the risk of cryptocurrency due to volatility, some enacted laws related to the illegal activities associated with cryptocurrencies, and some governments restricted the usage of cryptocurrencies or banned them. Countries such as Australia and Canada enacted laws about cryptocurrencies that regulate money laundering and financing terrorism. Countries like Bolivia, Nepal, and Vietnam ban activities that are related to cryptocurrencies. Some countries made regulations about cryptocurrencies according to their consideration as security, investment product, derivative, etc. There are other aspects of regulations about cryptocurrencies, such as taxation and creating the central bank's own cryptocurrency. Taxing cryptocurrencies is complicated due to the categorization of the gain. People could gain wealth from trading cryptocurrencies or mining. Based on the type of the gain, it could be a subject such as income gain or capital gain. For example, gain from cryptocurrencies taxed as a financial asset by Bulgaria and foreign currency by Switzerland and Spain make gains as the subject of income tax (Regulations of Cryptocurrency, 2018). Central banks consider creating their own digital currencies to protect people from the risk associated with price volatility. One of the purposes of the central bank digital currencies (CBDC) is to be a remedy to high volatility risk by being a stable digital currency. Another consideration of the CBDCs is to conserve their ability to control monetary policy. If People's adoption of cryptocurrencies reaches a significant level, it could impact the monetary policy of the central banks and can be a crucial problem for the sovereignty of the domestic currency. CBDC could reduce the risk of dollarization via the overuse of cryptocurrencies by people and contribute to financial stability (Central Bank Digital Currencies, 2020).

One of our motivations is to understand the position of cryptocurrencies for being a financial innovation and investigate the effects of cryptocurrencies on investors' behavior and regulatory institutions such as central banks. Since cryptocurrencies are relatively new and have a complicated structure, it is important to analyze the concepts of cryptocurrencies and distinguish the areas of usage, show the importance of the economic system, and investigate their effects on the behavior of investors and economies.

1.2. Thesis Structure and Research Objectives

In the second chapter of the study, we elucidate the general information about cryptocurrencies and provide some data about cryptocurrencies to elaborate on them. After providing general information, regularities and possible actions of regulators are discussed and theorized around cryptocurrencies and state sovereignty. This chapter aims to understand how cryptocurrencies evolved and what are the potential benefits and risks that arise from cryptocurrencies. One of the findings is that interest in cryptocurrencies increased in 2017 and 2021. The first increase root in their illicit usage of them and the latter is highly rooted in the global pandemic and economic disruptions worldwide arising from the pandemic. Another finding is that as the crypto ecosystem evolved, many technologies and tools have been invented to compensate for the conventional tools in traditional finance. Even though there are many different types of usage of cryptocurrencies, trading bitcoin is the most common way the usage of cryptocurrencies. One of the findings of the chapter is together with potential benefits considerable amount of money is being subject to illicit activities such as money laundering, and cryptocurrencies constitute a substantial risk to state sovereignty. Around the world, many countries have made regulations related to cryptocurrencies to protect consumers, and monetary policy, and to prevent illicit activities. On the other hand, there is a low number of countries that ban the usage of cryptocurrencies. Only El Salvador adopted bitcoin as a legal tender, and Venezuela created its own cryptocurrency. Due to the lack of standardization in regulations among countries, there are not any international regulations related to cryptocurrencies. The main contribution of this chapter is providing comprehensive information about cryptocurrencies and analyzing their potential effects on the

financial system. It has been shown that cryptocurrencies are highly volatile and constitute a substantial risk to investors. Furthermore, cryptocurrencies' inherit structure makes them easy to be subject to illicit activities. Besides their potential beneficial impacts, their detrimental effects are non-negligible. From money laundering to financing terrorism, cryptocurrencies are used for various types of illicit activities and constitute an important risk factor for economies in terms of economic and social. Furthermore, in the situation of being an alternative to fiat money, cryptocurrencies constitute a substantial risk to the independence of monetary policy and the sovereignty of states.

In the third chapter, the findings in the first chapter elaborated and made a comparison between developed and developing countries. Firstly, the global outlook of cryptocurrencies discussed differences between country groups are investigated. Due to the lack of standardization of data about cryptocurrencies, data about cryptocurrencies for comparing different country groups is based on volunteering. There are significant differences between country groups in terms of cryptocurrency numbers, customer types, and adoption levels. One of the findings is that the number of cryptocurrency users more in developed countries. One of the reasons for that, developing countries catch up later than developed countries in the cryptocurrency trend. As mentioned in the first chapter, there are two jumps in the increase in cryptocurrencies in 2017 and 2021. People in developed countries started to pay attention to cryptocurrencies during the first increase in cryptocurrency awareness. On the other hand, people in most developing countries started to put interest in cryptocurrencies at the second peak of global interest. One of the important findings is that the proportion of business and institutional investors high in developed countries. There are two significances of these findings. Firstly, it supports the late catch up the position of developing countries, and secondly, due to the tendency of institutional investors to use DECx and stablecoins, they are more common in developed countries. As mentioned in the first chapter of the thesis, the focus is on the potentially detrimental effects of cryptocurrencies on the economy rather than the potential beneficial effects. The main contribution of this chapter is that the strong institutional organizations in advanced countries cause the needlessness to show interest in cryptocurrencies for retail investors. Institutional differences among country

groups change the level of potential effects of cryptocurrencies on the countries' economies. The lack of strong institutional organizations in developing countries constitutes a situation of a higher level of risks that arise from cryptocurrencies. Also, the lack of economic stability in developing countries steers people to search for alternatives to protect their savings against the instability in the economies. The higher portion of retail investors in developing countries constitutes a substantial risk for cryptoization. People in advanced countries do not show interest in cryptocurrencies as much as in developing countries under favor of the existence of strong economy. On the other hand, High level of unemployment, inflation, and currency depreciation cause a higher interest in cryptocurrencies in developing countries. People approach cryptocurrencies as an alternative tool to protect their savings and gain far too much profit than conventional investments in developing countries. Compared to developed countries, cryptoization risk is more conceivable in developing countries, and cryptoization risk there at the independence of the monetary authority. One of the findings of this chapter is that there are three main determinants of the potential impact of cryptocurrencies on the countries' economies. The first one is the institutional differences among country groups, the second one is the regulations made by legal authorities about cryptocurrencies, and the third one is the adoption level of cryptocurrencies in countries.

In the fourth chapter of the research, we analyze the evolution of cryptocurrencies in Turkey. We provide the history of cryptocurrencies, regulations about them, investors' characteristics, and their impact on Turkey's economy. One of the findings is interest in cryptocurrencies in Turkey peaks in 2021, which corresponds to the second jump in interest worldwide, as mentioned in the second chapter. When it is compared to similar developing countries, Turkey's position of being a "latecomer" country is more significant. It has been found that meme coins are the focal point of cryptocurrency investors in Turkey. Also, people tend to invest in Tether as an alternative to foreign currency investment. As mentioned in the second chapter, financial differences between developed and developing countries and regulations related to them affect the tendency of using cryptocurrency. In Turkey, currency depreciation became more significant after 2018 and peaked in 2021. Also, transactions or profits related to cryptocurrencies are not subjected to any tax procedure in Turkey, whereas buying

foreign exchanges is subjected to tax. Consistent with the findings in the second chapter, the financial situation in Turkey and the lack of regulations related to cryptocurrencies increase the tendency to use cryptocurrencies. To elaborate on the research about cryptocurrencies in Turkey, we make a survey-based analysis to investigate the investor types, the demographic profile of the investors, and the drivers behind the cryptocurrency investment. When studies related to the adoption of cryptocurrencies are examined, it is seen that quantitative, qualitative, and mixed methods are used to analyze the adoption of cryptocurrencies. During the early period of cryptocurrency usage, studies were mostly made via interviewing users, and qualitative methods were used to make analyses. As the cryptocurrency ecosystem evolved, the number of cryptocurrency users increased, and researchers started to conduct survey-based studies and use quantitative methods more. Even though there are numerous studies that investigate the adoption of cryptocurrencies worldwide, studies about the adoption of cryptocurrencies are limited in Turkey. Studies have investigated the selection of cryptocurrencies, motivation for making payments via using cryptocurrencies, and adoption factors. Studies that research adoption factors considered more of the features of cryptocurrencies and the conception of cryptocurrencies. Survey-based analyses were made to comprehensively analyze the adoption of cryptocurrencies as one of the determinants of potential risks and benefits to the countries' economies. Six hypotheses are tested structural modal using data from cryptocurrency users in Turkey. Data from people who stopped to use cryptocurrencies and who have never used them before are analyzed using descriptive statistics to investigate the factors that affect the behavior of these groups of people. Our main contribution is investigating the adoption factors such as Turkey's financial and economic situation and regulations related to cryptocurrencies. Also, this study contributes to economics by analyzing the factors that cause people to stop using cryptocurrencies and never use them in Turkey. Our study is one of the earliest types of research about cryptocurrency adoption in Turkey, which comprehensively investigates the adoption factors.

CHAPTER 2

ORIGIN OF CRYPTOCURRENCIES

In essence, cryptocurrencies are a variety of technological developments based on the cryptography technique. The cryptography technique avails to protect information via transforming the data into a format that cannot be decrypted without a secret key. Cryptocurrencies are assured their safety using cryptography techniques with both private and public keys (Houben and Snyers, 2018).

Blockchain technologies constitute the technology behind cryptocurrencies. Blockchain is a decentralized ledger that consists of blocks (registries) of data, including data for transactions between parties. Parties with no trust in each other could come to an agreement on the ledger information via blockchain technology. Blocks that include valuable information are linked to each other with the help of cryptography and constitute an unchangeable ledger. There are policies for who could affect the blockchain systems. Control policy decides who could contribute to the progression of the blockchain and how blocks are accrued to the system of blockchain. Access policy decides who can reach and/or read the data. Consensus policy decides which blockchain is true and valid when there is a debate on resolving the chains (Sherman et al., 2019)

In 1979 David Chaum, who is a cryptographer, has written a dissertation about blockchain technology and, in 1983, designed the anonymous cryptographic digital money called e-cash. In 1989 Chaum created DigiCash, which is an initial form of cryptographic digital payments. With its technology, DigiCash provides users privacy when they want to withdraw money from banks. When users want to withdraw money from a bank using DigiCash, it specifies an encrypted key before it is sent to a receiver. With the help of cryptography, information for digital money transfers cannot be read

by unmeant people. This technology provides users privacy with their digital currency with the help of cryptography. Users' digital currency cannot be traceable by banks, governments, or other organizations (Pitta,1999).

Several technologies developed after Chaum's invention to the road to the creation of enormous numbers of cryptocurrencies nowadays. In 1998 Wei Dai created the b-money, which is an anonymous digital cash system with the motivation of a non-taxed and non-regulated system by force. After that, Nick Szabo invented bit gold, which is an electronic currency that seemed like the ancestor of the most popular cryptocurrency, bitcoin, with its technology. Szabo's consideration was the difficulty regarding the solution of problems and/or puzzles. He considered the time and energy for solving puzzles to have value, and the solution could be awarded with a digital coin. In his bit gold system, participants use the computer to solve cryptographic equations and send them to the community. With solutions, participants were awarded, and with each solution, the system created a chain of equations. When the chain grows, it is needed to accept solutions from most of the participants to verify new coins. All these digital coins contain the double-spending problem because of their structure. When a transaction has been done with digital currencies, the same digital currency can be reproduced by copying. Most digital currency inventors solve the double spending problem by renunciation part of their control to a central authority, which enables to the authorities to track of each participant's balance. On the other hand, Szabo had the idea of cryptocurrency, which is independent of a central authority. With his cryptocurrency bit gold, he proved that it is possible to solve the double-spending problem in a decentralized way (Peck, 2012).

2.1. The Breakthrough Point for Cryptocurrencies

Over the years there have been developed many technologies and attempted to create decentralized digital money. The breaking point of this attempt is bitcoin which is the first decentralized cryptocurrency. On the 31st of October 2008, the article "Bitcoin: A Peer-to-Peer Electronic Cash System" was published by Satoshi Nakamoto. This is the white paper on the epochal cryptocurrency. In this paper, Nakamoto wrote the technology and intuition behind the invention of Bitcoin.

Peer-to-peer technology allows users to send electronic cash directly to each other without the approval of a financial institution. Bitcoin's main benefit is the solution to the double-spending problem with its peer-to-peer network, which precludes the approval of third-party institutions. Bitcoin is invented to come through commerce with the trust-based model. In the trust-based model of commerce, it is needed to make an electronic payment with the approval of financial institutions as trusted third parties. Even though the trust-based model works for most transactions, it has weaknesses on certain points. The mediation cost of these institutions increases the transaction costs, limits the size of transactions, and prevents making small transactions. There is a higher cost when users need to make irreversible payments for irreversible services. These costs constitute a requirement for a third-party institution to make payments. When a physical currency is used to make payment, some of these costs can be prevented. On the other hand, without a trusted third-party institution, it is impossible to make payment through the communication channel. To be able to keep out these third-party institutions from the commerce system it is required a digital payment system that benefits from cryptography instead of commercial relationship based on trust. In favor of the cryptographic digital payment system, users could make transactions with each other without the requirement of approval from third-party institutions. Transactions in this system are unmakeable to reverse computationally, which means that sellers are protected from fraud in this system. Also, escrow mechanisms can be implemented in the system to constitute protection for buyers. Bitcoin uses peer-to-peer technology, which creates a solution for the double-spending problem (Nakamoto, 2008).

Through the evolution of cryptocurrencies, one of the main concerns was precluding the trust-based system, which requires approval for transactions from third-party institutions. Bitcoin is the first digital currency that provides a solution for the requirement of these institutions. When considered from this point of aspect, Bitcoin paved the way for decentralized systems to be means of payment. In the white paper on Bitcoin, mechanisms solve the necessity for third-party institutions.

Nakamoto defined bitcoin with digital signatures. Transaction mechanisms depend on two keys which are the public key and the private key. Each user transfers the Bitcoin

by signing it, and all transactions constitute a chain together cumulatively. The double-spending problem is prevented by announcing all transactions publicly, which means that there is no requirement for a trusted institution to approve the validity. Since all transactions are publicly announced, all participants can see the history of all transactions and can agree on it. Since all transactions announce publicly, privacy in the system constitutes a concern for users. In the trust-based model of commerce, third-party institutes limit users' reach to information. To be able to preclude third-party institutions, the system keeps public keys nameless. Everybody can see the information for all transactions with the amounts and without the name of the user. There are nodes in the system, and they ensure that the chain in the system is the correct one and work to extend the chain. Nodes use computers to verify the chain and create blocks to add to the chain. One type of node is the mining node which uses the computer to create new coins and add to the circulation. Gold miners use their computers to create new gold, and there is an incentive to do it in the system. The system considers the CPU time and the required electricity expenditure for mining new gold as resources and gives incentives to gold miners. The incentive works as an encouragement for gold miners and as a mechanism for honesty (Ibid).

2.2. Crypto Ecosystem and Token Types

As cryptocurrencies evolve, the need for crypto-related businesses is increased. Various types of tokens and crypto-related new businesses emerged to fulfill the absence of a mechanism that compensates for the conventional mechanisms in financial systems.

Cryptocurrencies or cryptocurrency coins generally aim to fulfill the functions of fiat money. Most cryptocurrency tokens have features like being divisible and fungible. The first cryptocurrency is bitcoin and cryptocurrencies other than bitcoin are called altcoins. Most of the altcoins use the protocols of bitcoin but there are some altcoins that use their own blockchain protocols. There are many other types of tokens or coins that have other purposes than functioning as money. One of the most popular tokens is Ethereum. Ethereum is a cryptocurrency token that relies on its own Ethereum blockchain. It can be created new tokens in the network of ETH and that ability provide substantial feature like creating stablecoins. Stablecoins are the type of cryptocurrency

tokens that aim to stabilize their value by pegging it to another asset. Tether is one of the most popular stablecoins that peg its value to the U.S. dollar via using the Ethereum blockchain. Another type of cryptocurrency token is a utility token. In 2017 there was an initial coin offering[5] (ICO) boost and utility tokens were the center of attention in the matter of ICO boost. The reason behind the occurrence of utility tokens is the stern regulations related to making investments via using cryptocurrencies. In general utility tokens are used as a tool for raising funds for a project. On the other hand, people can use utility tokens as a speculative investment tool. While some ICOs use utility tokens to raise funds to aim to circumvent regulations, some other ICOs wanted to raise funds suiting with regulations. Security or equity tokens came into to crypto ecosystem to fulfill the funding mechanism that suits regulations. Security tokens serve as the equivalent of traditional stocks. When people buy security tokens they have a portion of the cryptocurrency and security tokens provide a shred of evidence for ownership. Security tokens record the ownership of a proportion of cryptocurrencies on the blockchain. Even some platforms give the right for voting to people who have their security coins as in the shares in the traditional financial system. One more cryptocurrency token is called the social token. Social tokens back their value to a community such as sports clubs and brands. People use social tokens to support the community they like so they are also called "fan tokens". Social tokens gained popularity, especially in 2020, and increased tokenization among people. A governance token is one of the cryptocurrency tokens that have a similarity with stocks. Holders of governance tokens have the right to the decision-making process of the protocol of the project. Investors can influence the future of the project by affecting protocols such as distribution methods by having decision rights. One of the important token types is the debt token. Debt tokens created the equivalents of credit mechanisms such as mortgages and corporate bonds. Even though it is tried to create alternative credit mechanisms that are using debt tokens, they include a high level of default risk. One of the interesting tokens is non-fungible tokens (NFTs). NFTs' main feature is being a non-fungible token as it is in the name. NFTs gain popularity with the blockchain game that allows people to create unique kittens. NFTs provide the

[5] An initial coin offering (ICO) is the cryptocurrency industry's equivalent to an initial public offering (IPO). A company seeking to raise money to create a new coin, app, or service can launch an ICO as a way to raise funds (Investopedia).

uniqueness of a digital product by using the Ethereum blockchain. After gaining popularity NFTs were used for proof of the originality of different types of products. NFTs can be used for visa issuance and identity checks furthermore for painting or music. One important feature of NFTs is having a fraction of digital work such as a painting. That feature allows people to trade millions of dollars worth of artwork easier (Chetverikov, 2020). Privacy coins become distinct among cryptocurrencies by providing further anonymity to investors. Their inherit feature allows people to conceal their transactions from other people and makes it harder to track the transactions. Because of the further anonymity, criminals tend to use privacy coins for illicit activities such as money laundering. Even though these types of coins bring much more anonymity to people ordinary cryptocurrency investors do not put much attention to privacy and use more common and less complicated cryptocurrencies such as bitcoin. Together with criminals, large companies use privacy coins to obscure their transactions from other people (Kim, 2022). Exchange tokens are one of the most important token types due to their purpose of creation. Exchange tokens are tokens that are created by cryptocurrency exchanges. The main motivation behind creatin exchange tokens is increasing blockchain adoption. To increase the adoption, creators design exchange tokens to be more liquid and encouraging for trading. Exchanges can reward their users with a proportion of exchange tokens that are associated with the level of the trading volume. Though this mechanism the gap between the bid and ask price of the token can decrease which corresponds increase in liquidity. Most of the exchanges offer lower fees with the usage of their own tokens. Lower fees can increase loyalty to the exchanges and encourage people to adopt the crypto ecosystem. Also, some exchange tokens are designed as governance tokens and stablecoins. Having a right to exchanges' future through exchange tokens designed as governance tokens could contribute to the adoption of them by people. Exchanges can design their own tokens as backed by more stable currencies such as U.S dollars which corresponds to a type of stablecoin. Since people are more familiar with crypto exchanges, stablecoins that are created by exchanges could be adopted by people easily. Being a bridge between the crypto ecosystem and traditional finance is a substantial role of stablecoins. Exchange tokens can contribute to the trust relationship between

regulators and users through functioning as stablecoins (“Cryptocurrency exchange tokens”, 2022).

Types of cryptocurrencies evolve as the crypto ecosystem matures and diffuses to financial systems. Among the different types of cryptocurrencies, Central Bank Digital Currencies (CBDC) can be assessed separately due to their issuance by legal regulatory authorities. Together with CBDC, Electronic money (e-money) tokens are also a critical classification of virtual currencies. The distinction between e-money tokens and cryptocurrencies constitutes a critical situation due to being subject to regularities done by legal authorities in some countries. Classification of cryptocurrencies under the e-money definition is important in the European Union and especially in the UK. European Commission defines e-money as “a digital alternative to cash. It allows users to make cashless payments with money stored on a card or a phone, or over the internet” (E-money 2018). Therese is not a single definition of CBDC. Generally, CBDC is a form of money that carry out all functions of money and central banks consider them as their liabilities. CBDC is defined as “a digital form of central bank money that is different from balances in traditional reserve or settlement accounts” (CPMIMC, 2018).

2.3. How Did Cryptocurrencies Spread?

Since the inception of Bitcoin, people have put attention to it, and many other cryptocurrencies have been created. Even though it has a complex structure with the technology it has, cryptocurrencies are becoming a part of daily life day by day increasingly. The technology behind cryptocurrencies may excite people or the possibilities of cryptocurrencies used as a payment method for commercial relationships. To understand how much cryptocurrencies have spread, it will be providing some data regarding it.

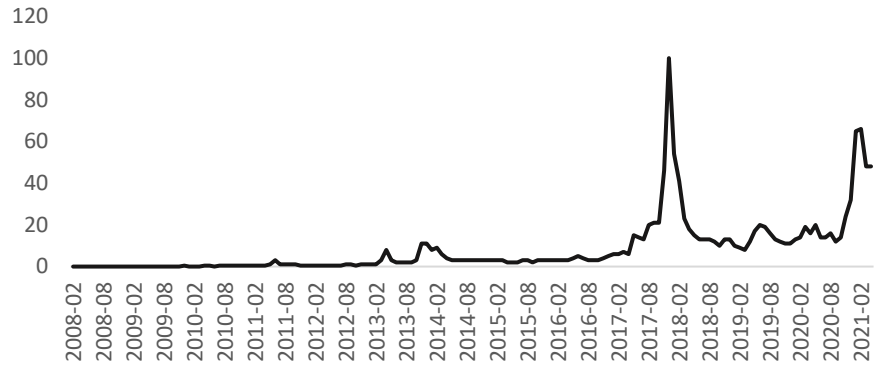


Figure 2.1 Search for "bitcoin" in Google Around Worldwide Since Its Invention

Source: Data sourced from Google Trends[6]

As seen in figure 2.1, the search for bitcoin was steady during the first years of its invention. Even though some activation happened during the years 2013 and 2014, actual interest in bitcoin started at the end of 2016. The highest interest in the bitcoin search emerged in December 2017. Since bitcoins were the pioneer of decentralized cryptocurrencies, their search in Google is important to understand the attention of people on cryptocurrencies. Google search data gives an important hint about the excitement about cryptocurrencies by people. Alongside the interest in cryptocurrencies, it is beneficial to examine the number of cryptocurrency users.

[6] The numbers show search interest relative to the highest point on the graph for a particular region and time. A value of 100 is that the term enjoys the highest popularity. A value of 50 means that the term is half as popular as that. A value of 0 means that there is not enough data for this term.

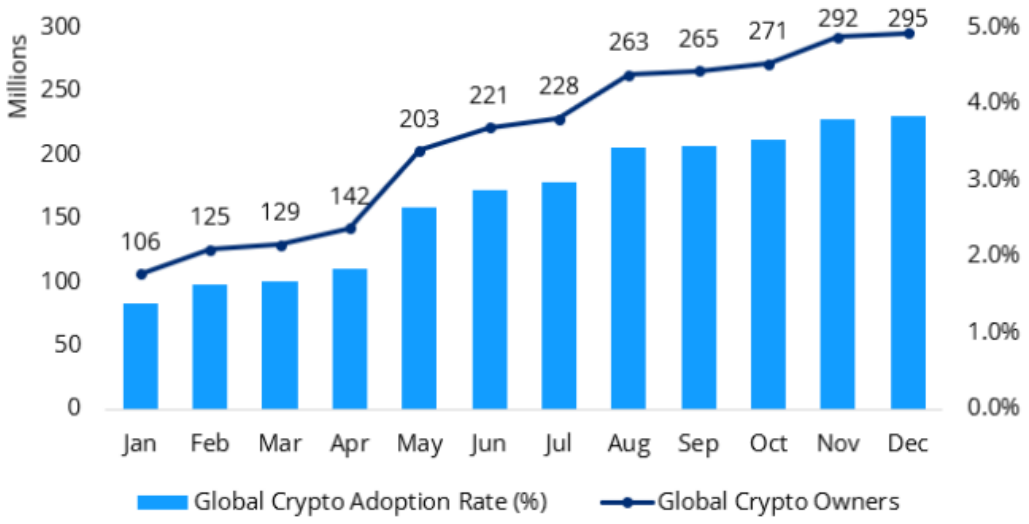


Figure 2.2 Global Cryptocurrency Owners and Adoption Rate, (January 2022) [7]

Source: Crypto.com

Consistently with the google search data, as interest in cryptocurrencies increased, cryptocurrency users and adoption of cryptocurrencies increased. In a report published in January 2022, it is estimated that the overall population of cryptocurrency users reached 106 million in January 2021, and at the end of the year, it reached 295 million. According to their projection, if the increase in the number of cryptocurrency users continues at the same pace, the number of cryptocurrency users will reach 1 billion (Crypto Market Sizing, 2022).

As more people started to use cryptocurrencies for investment, cryptocurrency creators tended to create more cryptocurrencies. In 2011 Litecoin and Namecoin have been created by following the footsteps of bitcoin. The evolution of the number of cryptocurrencies has increased as time passes. In the beginning, the reason for creating new cryptocurrencies was to join the new form of currency environment. For the purpose of it, other cryptocurrencies have been created by using similar technology as the bitcoin. Afterward, the area of usage of cryptocurrencies increased and many other cryptocurrencies are created.

[7] Global crypto adoption rate (%) corresponds the number of cryptocurrency owners in the world population.

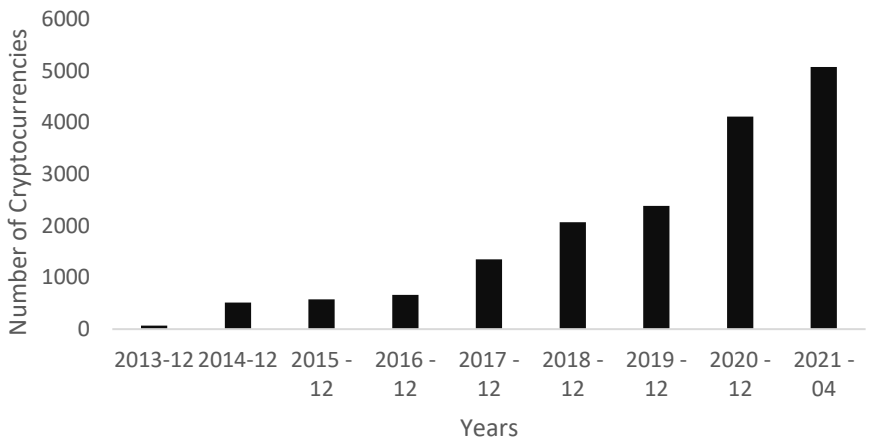


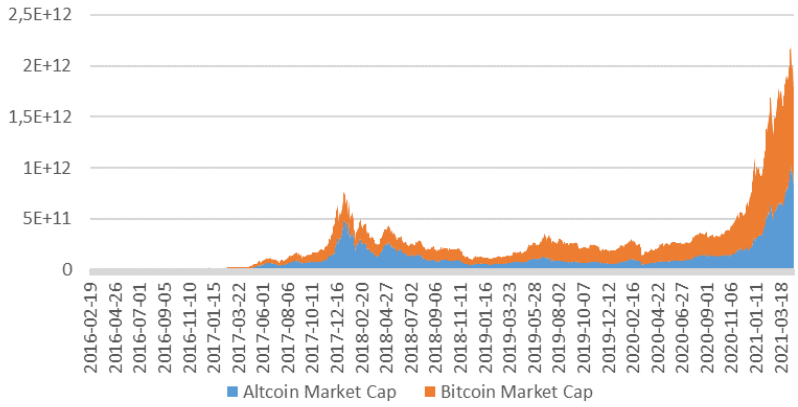
Figure 2.3: Increase in the Number of Cryptocurrencies

Source: Data sourced from coinmarketcap[8]

Figure 2.3 shows the increase in the number of cryptocurrencies over time. In 2013 there were only 67 cryptocurrencies, and the number of cryptocurrencies reached over 5000 at the time of this study. Especially over the last five years, the number of cryptocurrencies increased significantly. It is seen that the breaking point for the increase started in the year 2017, which is sensible when considering that 2017 was the year of the search for bitcoin. The boom in the number of cryptocurrencies started in the year 2020. In 2020, covid-19 pandemic affected the global economic system, and many countries all around the world experienced economic recession. Lots of countries took precautions, such as forcing people to stay in their homes. As a result of these precautions, consumer activities slowed down, and people who have firms experienced bankruptcy. Also, trading activities have been restricted due to covid-19. The rising level of interference by governments in the economic system may affect the opinions of people. Since cryptocurrencies are decentralized systems, people who want to exclude adverse effects in investments due to such interventions by governments may tend to invest in cryptocurrencies. The rise in interest in cryptocurrencies in 2020 and 2021 encouraged the cryptocurrency market, and the number of cryptocurrencies has upsurged.

[8] Data for the number of cryptocurrencies that created are available earliest for the year of 2013. Calculations have been done based on data from: https://coinmarketcap.com/historical.

(a)



(b)

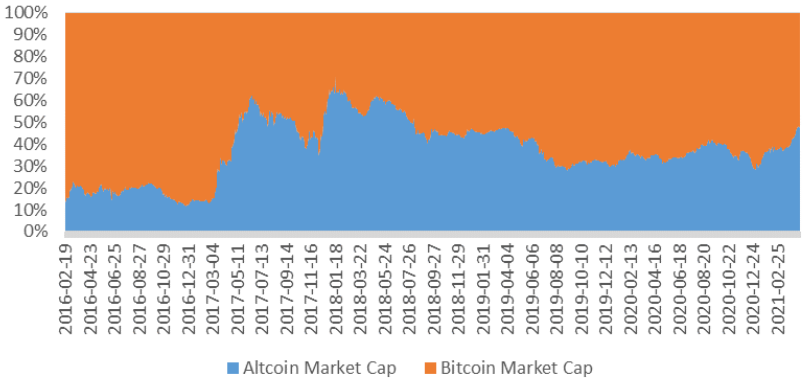


Figure 2.4: Total Market Capitalization of Cryptocurrencies over Time

Source: Data sourced from Coin Dance[9]

As the number of cryptocurrencies increases, people tend to use more of them in their economic activity. Figure 2.4 (a) shows the cumulative market capitalization of cryptocurrencies between 2016 and 2021. As seen in figure 2.4 (a), in 2017, the total market capitalization of cryptocurrencies reached over 500 billion U.S. dollars. After its rise in 2017, during the next three years, the total market capitalization of cryptocurrencies fluctuated and could not reach its previous peak value until 2020. Since 2020, the total market capitalization of cryptocurrencies has increased by over 2 trillion U.S. dollars. Within just one year, the total market capitalization of cryptocurrencies quadrupled its value in 2020. Advancement in the market size of

[9] Data available at https://coin.dance/stats/marketcaphistorical

cryptocurrencies indicates that people put interest in the cryptocurrency market during 2020, which is consistent with the increasing number of cryptocurrencies and the prices of cryptocurrencies. As a result of increasing demand in the cryptocurrency ecosystem, the market capitalization of cryptocurrencies has increased, and competition between cryptocurrencies has been raised. In figure 2.4 (b), it is seen that at the beginning of cryptocurrency popularity, bitcoin had the highest market share. In 2016, bitcoin dominated the cryptocurrency market, and in 2017 other cryptocurrencies were created to benefit from increasing interest in cryptocurrencies. After 2017 market share of bitcoin started to fall. Over the next four years, competition between cryptocurrencies increased, but bitcoin maintained its market share of around fifty percent.

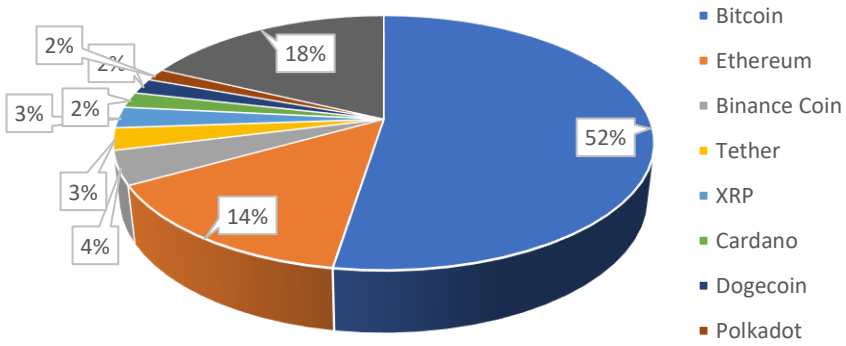


Figure 2.5: Shares of Market Capitalization by Cryptocurrencies

Source: Data sourced from Coin Dance[10]

Figure 2.5 shows that at the time of this study, bitcoin has the highest market share among all other cryptocurrencies with a rate of %52,5. Ethereum and Binance Coin have the highest market capitalization after bitcoin, with rates of %14,3 and %4,25 in sequence. It is obvious that bitcoin is leading the competition between cryptocurrencies with a huge gap to its closest rival. It can be interpreted that bitcoin has the advantage of being the first decentralized cryptocurrency. Because of its pioneer position, the media showed more attention to it, and people became familiar. Ethereum was invented in 2015, and Binance Coin was invented in 2017. Even though

[10] Data available at https://coin.dance/stats/marketcaptoday

there are cryptocurrencies invented earlier than Ethereum and Binance Coin, such as Litecoin and Peercoin, established in 2011 and 2012 in sequence, the former two cryptocurrencies have more market share than the latter ones. It is understood that the cryptocurrency ecosystem is highly challenging for competition between cryptocurrencies. As bitcoin became more popular, other cryptocurrencies started to enter the ecosystem. Entrance into the cryptocurrency ecosystem is relatively easy in terms of cost. People who want to make a profit from cryptocurrencies have made many altcoins with the help of low cost. On the other hand, the increasing popularity of cryptocurrencies gives an opportunity for inventors of cryptocurrencies to make significant profits. At the time of this study, the Dent is the 100th cryptocurrency in terms of market capitalization, and even though it was created in 2017, its market capitalization has reached over 700 million U.S. dollars[11].

Even though there are so many cryptocurrencies in the crypto ecosystem, bitcoin still dominates other cryptocurrencies in terms of market capitalization share. Due to its pioneer position, it is beneficial to investigate the statistics related to bitcoin. Furthermore, since other cryptocurrencies try to act like bitcoin, investigating bitcoin could give valuable information about the crypto ecosystem.

[11] List of market capitalization of cryptocurrencies available at https://coinmarketcap.com/all/views/all/. General information and ICO start date of Dent sourced from https://icorating.com/ico/dent-dent/.

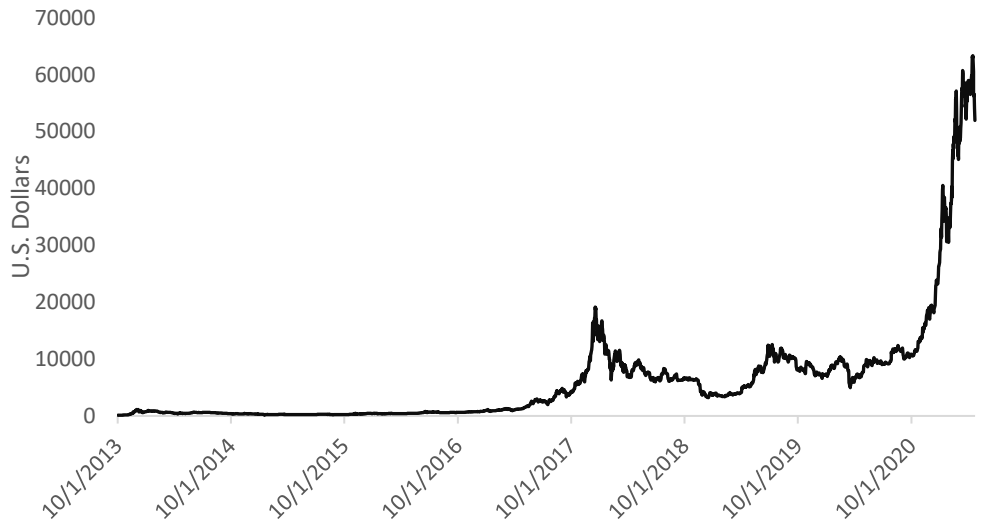


Figure 2.6: Bitcoin Price Change Over Years

Source: Data sourced from coindesk.com[12]

Figure 2.6 shows that the price of bitcoin exhibited steady from its creation until 2017. In November 2017, the price of bitcoin exhibited a big jump from its invention and had risen by over 13,000 U.S. dollars. After its first big jump, the price of bitcoin fluctuated between 3,000 U.S. dollars and 12,000 dollars until 2020. Starting from September 2020, the price of bitcoin has risen significantly during the next six months and reached over 60,000 U.S. dollars. As seen in figure 2.4, the first big jump in the price of bitcoin happened in 2017. Popper (2017) investigated the reasons behind the price jump in bitcoin in 2017. His findings emphasized the decentralized structure of bitcoin that call forth a loss of control by governments and institutions over bitcoin. The decentralization of bitcoin and other cryptocurrencies, which are decentralized, comprises such risks as price manipulation and money laundering. In 2017 Bitfinex was the largest platform for trading bitcoin. In 2015 a hacker stole 1,500 bitcoins from Bitfinex, and in 2016 Bitfinex lost 120,000 bitcoin worth $75 million. After these hackings, Bitfinex spread its loss to customers, and banks detained its operations of Bitfinex. Even though banks have been detained operations, Bitfinex found a way to impact the cryptocurrency environment. In 2014 a cryptocurrency called Tether was created by the officials of Bitfinex, and after these hacking incidents, Tether became

[12] Coindesk uses API (application programming interface) for collecting data. In this graph calculations have made using “closing price” of bitcoin.

popular for trading. People bought Tether through Bitfinex and transferred Tether to other cryptocurrencies, which is a way of transferring money without the necessity of banks. Bitcoin was the cryptocurrency for transferring, and a hundred million dollars were transferred to other cryptocurrencies. The major part of the rise in the price of bitcoin in 2017 was caused by speculation through Tether (Popper, 2017). It is understood that the first expansion of interest in bitcoin in 2017 was rooted in the desire to use them for illicit activities. The tendency of people to use cryptocurrencies for illicit activities constitutes a substantial risk for countries' economies. Together with the detrimental effect on economies, illicit usage of cryptocurrencies impedes the level of joining the crypto ecosystem of people.

Another risk for people to join the cryptocurrency ecosystem is the high volatility in the price of cryptocurrencies. Bitcoin is one of the most traded cryptocurrencies in terms of daily trade volume. At the time of this study. Bitcoin has almost 60 billion U.S. dollars in trade volume.

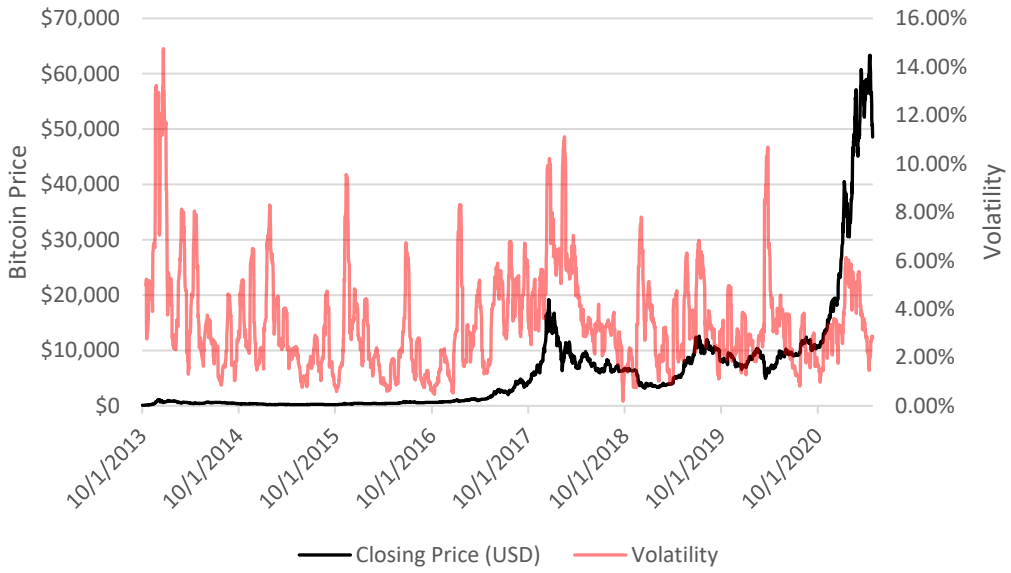


Figure 2.7: Volatility in the Price of Bitcoin

Source: Author's calculation based on data from CoinDesk.[13]

[13] Data available at https://www.coindesk.com/price/bitcoin. Volatility is calculated by standard deviation using 20 days moving average.

Figure 2.7 shows that the bitcoin price is highly volatile, which means that it consists of high risk in terms of return. Since the price of bitcoin is highly volatile, it involves an opportunity to make a high profit. Together with losing money with the hacking probability and high volatility in the cryptocurrency prices, cryptocurrencies are highly risky assets for investment.

Analyses done above related to bitcoin are done due to the reason of its pioneer situation. Bitcoin is the most traded cryptocurrency, and it constitutes the majority of the potential benefits and risks related to the crypto ecosystem. One of the important contributions to the cryptocurrency and bitcoin spread comes from the cryptocurrency exchanges.

Cryptocurrency exchanges function as platforms for trading cryptocurrencies for other currencies. Cryptocurrency exchanges constitute an intermediary position between buyers and sellers. Their intermediary position provides making profit through commission payments to them when people trade cryptocurrencies using these platforms. There are two types of cryptocurrencies decentralized cryptocurrency exchanges (DEX) and centralized cryptocurrency exchanges (CEX). Centralized platforms act as trusted third-party institutions and provide protection with extra security to people who want to trade with cryptocurrencies. On the other hand, CEXs are more user-friendly when it comes to trading with cryptocurrencies. People can trade without using peer-to-peer transactions or crypto wallets using these platforms. CEXs hold their customers' cryptocurrencies and provide a simple system to trade. Even though CEXs are easy to use and provide trustworthiness to people, they charge transition fees which can be high for people who trade large amounts of cryptocurrencies. Because of its easiness to use, so many people use CEXs with large amounts of cryptocurrencies. Since CEXs hold huge amounts of cryptocurrencies worth billions of U.S. dollars, they are the target for thieves. Hacking attacks on CEXs cost millions of U.S. dollars. Decentralized cryptocurrency exchanges give a way to carry out peer-to-peer transactions without a third-party institution. Crypto wallets and keys come out when people want to make transactions using decentralized cryptocurrency exchanges. Making transactions via DEXs is much more reliable and decreases hacking risk. Other benefits of DCXs are preventing market manipulation

and protecting people from wash trading[14]. Also, people preserve their anonymity when they use DEXs, and DEXs provide people privacy. On the other hand, people cannot trade digital fiat currencies using DEXs which makes it useless when people do not already have cryptocurrencies (CFI, 2020).

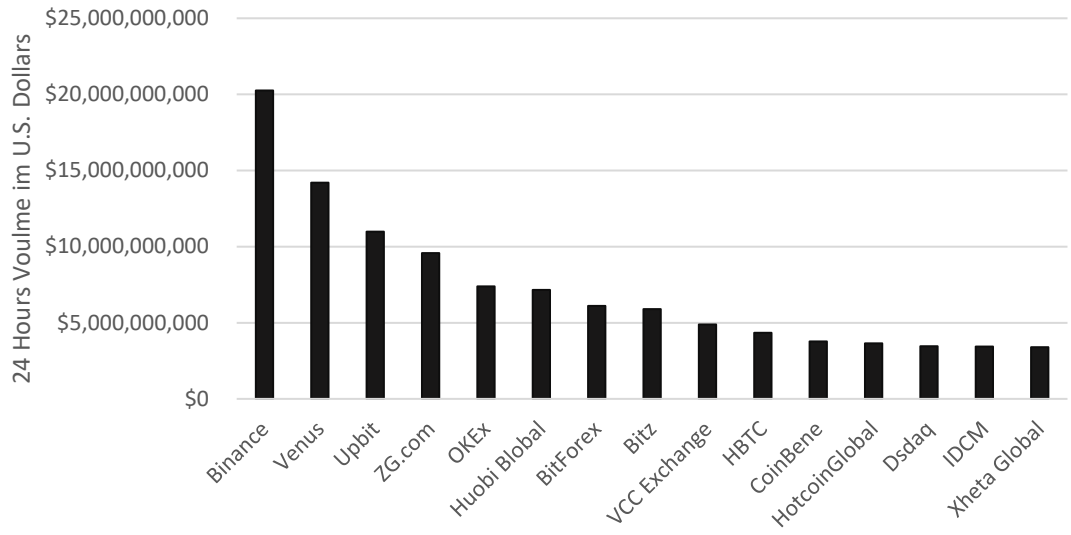


Figure 2.8: Centralized Cryptocurrency Exchanges by 24-Hour Volume (April 2021)

Source: Data sourced from coinmarketcap.com[15]

It can be seen that the 15 largest cryptocurrency exchanges by 24 hours volume in Figure 2.8. Figure 2.8 shows that Binance is the most used platform for cryptocurrency trading at the time of this study. Binance is the largest cryptocurrency exchange, with over 20 billion U.S Dollars in volume in the last 24 hours. These cryptocurrency exchanges have 108 billion U.S. dollars 24 hours volume together. Daily trade of 108 billion U.S dollars indicates that CEXs are constituted a big market which makes CEXs an attraction point reason for hackers. CEXs have contributed to the diffusion of cryptocurrencies significantly due to the easiness of usage. Since people are getting used to making an investment with third-party intermediaries such as banks, the structure of CEXs makes it easy to use them by people for cryptocurrency investments. Together with the benefits such as easiness to use, risks such as being a target for

[14] Wash trading – also referred to as round trip trading – is an illegal practice where investors buy and sell the same financial instruments at the same time in order to manipulate the market.

[15] Graph is made with the data reached at 25th of April 2021. Data is available at https://coinmarketcap.com/rankings/exchanges/.

hacking incidents constitute a significant risk for investors. As seen in figure 7, there is so much money that is traded in CEXs, and potential hacking incidents correspond to an important risk. As seen in the figure, Binance is the most popular trading platform among them, and it has been the subject of a hacking incident that is elaborated on in the second chapter in terms of the risks that arise from cryptocurrencies.

Increasing interest in cryptocurrencies brings the attention of regulatory institutions such as central banks and financial institutions. All this interest in cryptocurrencies shows that cryptocurrencies have a significant position in being financial innovations. Of course, increasing interest in the cryptocurrency ecosystem and the statistics above do not mean that everything is rainbow and unicorns. Cryptocurrencies comprise many risks, such as hacking attacks and trust issues of exchanges. On the other hand, cryptocurrencies bring unique technologies into the financial system and provide easiness, such as making faster and lower fee transactions. In terms of assessment, there are two views related to the literature. The first view focuses on the potential benefits of cryptocurrencies for the financial system. The second view, on the other hand, puts more attention on the potentially detrimental effects of cryptocurrencies on the financial system.

2.4. Role of Cryptocurrencies as a Financial Innovation and as a Risk Factor

The invention of bitcoin brought a whole new approach to the financial system. In the white paper on bitcoin, it is asserted that bitcoin is a new form of digital currency named cryptocurrency, which has a decentralized structure. Even though many other cryptocurrencies have been created over time, bitcoin is still the most popular and known cryptocurrency. Because of its pioneer and popular position in cryptocurrencies, the main interest in this study will be on bitcoin.

Bitcoin aims to be the remedy for high costs arising from dependency on third-party institutions to make payments. Also, with its technology based on cryptography, it promises to be a safer payment method. Another advantage of bitcoin is privacy and anonymity. One of the purposes of bitcoin is to be alternative money. Bitcoin must fulfill all the functions of money to replace fiat currencies.

In an economy, money has three main functions, which are being a store of value, a unit of account, and a medium of exchange. The function of being a medium of exchange means that money is a tool to make transactions. Using money reduces spending time on trade. Also, using money as a medium of exchange allow people to be expert in production, which increases productivity. People use the money to measure value, and when they use money for measuring it, money functions as a unit of account. This function allows measuring goods and services in uniform measure. To perform as a measurement unit for value requires to be stable. When a currency fluctuates frequently, it requires that necessity in a change of prices. Because of this reason, being a good unit of account requires stability in currency; otherwise, currency measures the value of goods and services poorly. Functioning as a store of value requires using money as holding wealth. For a better way to hold wealth money, a currency or asset needs to have a high return. Furthermore, using money as a store of value is related to being a medium of exchange function. Since money is used as a medium of exchange, relatively less return on money against other assets worth holding money to store value (Abel et al.,2013, p.244).

To fulfill the medium of exchange function of money, bitcoin needs to be accepted by many merchants. At the beginning of bitcoin, a few firms accepted bitcoin as a payment method, and there were a few cryptocurrency exchanges. Satisfying the medium of exchange function for bitcoin evolved day by day, and at the time of this study, bitcoin has over 7,5 billion U.S dollars volume in 24 hours. Even though most of these transactions are between cryptocurrencies, significant improvement has been made in using bitcoin to purchase goods and services. At the time of this study, many firms are accepting bitcoin as a payment method. The distribution of firms by industry is various. Since 2014 Twitch which is an online streaming platform, is accepting bitcoin as a payment method. Overstock.com is one of the biggest online stores in the world, which also started to accept bitcoin as a payment method in 2014. Also, the Microsoft-owned platform Xbox Store started to accept bitcoin for purchases to buy games and digital content in 2014. In 2015 Rakuten, which is an online retail firm, accepted bitcoin as a payment method. On the 5th of July 2018, Stephen James BMW, which is a BMW and MINI dealership in London, made a tweet that announced accepting bitcoin to purchase new vehicles. In 2019, AT&T, which is one of the

biggest mobile carrier companies, started to accept bitcoin as a payment method via the BitPay application. In 2020 Starbucks, which is a multinational coffee shop brand, accepted bitcoin as a payment method via the Bakkt application. On the 24th of March 2021, Elon Musk made a tweet that announced the acceptance of bitcoin as a payment method for purchasing Tesla, which is one of the most popular electric cars. All these adaptations by firms make it easier for bitcoin to satisfy the medium of exchange function of money. One of the milestones for bitcoin being a medium of exchange all around the world happened on the 30th of Mach 2021. PayPal, one of the most used money transfer systems, announced bitcoin's acceptance to purchase with many merchants. All these acceptances by firms make it easier to become familiar with cryptocurrencies as the new currency for being a medium exchange for people.

On the other hand, confirmation of bitcoin transactions takes more time than other payment methods. As people are getting used to cryptocurrencies, trading volume and the number of transactions are increasing. A rise in the number of transaction cause congestion which increases the transaction time. When a transaction sends, users must wait for confirmation from miners. The amount of cryptocurrency also affects the number of required confirmations which can reach six confirmations. The average time of a bitcoin transaction is 10 minutes, but as the number of bitcoin rises, transaction time can reach an hour. Also, the transaction fee is another indicator for confirmation. Lower fees can cause miners to be ignorant of the transaction, which increases the time of its confirmation (Dog, 2020). Complication structure of cryptocurrencies makes it hard to become familiar with people. Especially long time for making transactions constitutes a significant obstacle for cryptocurrencies to carry out the medium of exchange function of money.

As shown before, the bitcoin price is highly volatile. It is not feasible to determine the value of anything with a highly volatile currency. High volatility in the price of bitcoin makes it unpredictable and constitutes a necessity for recalculating the prices of goods and services frequently. When it comes to satisfying the unit of account function of money, cryptocurrencies are not good options due to the high volatility in their prices. High volatility is in the bitcoin price also detrimental for bitcoin to carry out to function as a store of value. High volatility in the bitcoin price affects the return of bitcoin

badly, which reduces the strength of bitcoin to be a store of value. In addition, there is no interest in cryptocurrencies as it is in fiat money which is not suitable for satisfying the store of the value function.

Even though there is no consensus for accepting cryptocurrencies as money, some academics have studied cryptocurrencies in the realm of fiat money functions. Baur et al. (2018) studied the position of bitcoin as a medium of exchange using date between 2010 and 2015. According to their regression analysis, it is found that bitcoin is used for investment rather than being a medium of exchange (Baur et al., 2018). Bjerg (2015) evaluated bitcoin considering Knapp's and Keynes' ideas related the fiat money. Firstly, he asserted that bitcoin shares the same characteristic as some paper money, as accepted by a community for exchanging goods and services without intrinsic value. Secondly, he asserted that states determine the desire for using money by people via demanding money from people such as collecting tax. The lack of a desire for collecting tax by states via bitcoin and the existence of voluntariness in using bitcoin makes bitcoin a type of fiat money externally to the states. He defined bitcoin as "post-fiat money" due to its decentralized structure and working principle based on volunteering. He argued that in the case of accepting bitcoin as a payment method for tax by states, the sovereignty of states could be questionable since in the fiat theory money is defined as a formation of a state by its sovereignty (Bjerg, 2015). Carrick (2016) discussed the position of bitcoin as a currency with the fiat theory of money. He asserted that all their functions of money are debatable for bitcoin and mainly differ by interpretation. According to his assessment even though there are similarities between currencies and bitcoin, a high level of volatility and not being backed by the state make its legitimacy for being a currency ambiguous. He compared the relative volatility of bitcoin and emerging market money via a correlation matrix and concluded that "Bitcoin has characteristics that make it complement other currencies, especially emerging market currencies" (Carrick, 2016). Kubát (2015) has analyzed bitcoin in the context of money definitions and asserted that bitcoin does not fulfill the definitions of money. He supports his claim by emphasizing the perception of bitcoin by states. According to his findings even though states mention about bitcoin in their law, mentions are mostly about some type of banning procedures related to bitcoin. He analyzed the volatility of bitcoin by considering the standard deviation of its price

through four years and concluded that bitcoin does not perform the store of value function of money (Kubát, 2015). Mikołajewicz-Woźniak & Scheibe (2015) have studied the relationship between money and cryptocurrencies by analyzing four different scenarios of social acceptance. They have concluded that cryptocurrencies compensate for the lack of modernization in the financial sector and provide solutions for problems arising from changes in finance. They assert that cryptocurrencies shape the financial sector and the role of regulatory institutions dramatically. They have asserted that cryptocurrencies will be a substitute for national currencies and redefine the money concept. Furthermore, cryptocurrencies will create an entirely new system that precludes the state's power of controlling money (Mikołajewicz-Woźniak & Scheibe, 2015). Nicholas Taleb (2021) asserted that due to the certain level of requirement for interest, in the future there will be no necessity for mining and the price of bitcoin will be worth zero. Also, the volatility of the price and lack of a proxy for bitcoin makes it difficult to perform as a payment system. Furthermore, the necessity for a combination of goods for providing a hedge for inflation makes it tough for bitcoin to perform as hedge tool against inflation. It is evaluated that the technology behind bitcoin is not great and when its ability for solving problems is considered (Nicholas Taleb, 2021). Lambrecht & Larue (2018) asserted that bitcoin is far away from being a money and performs as speculative asset. Volatility in the value of bitcoin precludes the use of it as substitute for currency and confirmation time for transactions lowers the practicality that makes it inefficient for storing the value. Also, decentralized structure constitutes sustainability risk and increases the uncertainty for valuing holdings for users. Furthermore, anonymity of bitcoin lowers the privacy and paves the way for use of it for criminal issues such as tax evasion (Lambrecht & Larue, 2018). Tut (2022) argues that bitcoin does not meet the functions of money, and it is a type of investment. Due to the volatility in the price, it is difficult to determine the future prices of goods, and making transactions via bitcoin is inefficient. Furthermore, volatility decreases the capability of being a store of value. On the other hand, volatility in the price provides opportunities to gain money from making investments. Also, it is stated that the technology underneath bitcoin is determine its value of it, and this technology could change the traditional finance (Tut, 2022). Luther, W. J. (2016) emphasized the sponsorship of governments for fiat monies. The confliction between

objectives of governments and bitcoin due to the certain reasons such as making illicit transactions by using bitcoin, and the aim of conducting independent monetary policy cause to the lack of sponsorship of governments for bitcoin. To be able to function as money for bitcoin, unusual affairs like support of government for bitcoin or hyperinflation is needed (Luther, W. J. 2016). Furthermore, some studies evaluated the cryptocurrencies within the post-Keynesian and Schumpeterian views. According to their assessments, people have used cryptocurrencies for speculative purposes rather than use them as beneficial financial tools. It is stated that cryptocurrencies do not meet the properties of Keynes for money, and they are "speculative assets". According to this perspective, cryptocurrencies need to be regulated rationally to stabilize the financial market (Vianna, 2021; Ülgen, 2014; Leathers & Raines, 2004).

It is understood from the literature that there is no consensus about the position of cryptocurrencies about being fiat money. While some academics assert that cryptocurrencies perform the store of value function of money, others emphasized the similarities between cryptocurrencies and fiat money. Even though there is no consensus, the importance of the relationship between cryptocurrencies and fiat money is obvious. The effect of cryptocurrencies on countries' economies due to this relation comes from the threat of cryptocurrencies to the sovereignty of countries. Certain properties such as being a decentralized system and not having an inflationary aspect pave the way for cryptocurrencies to act like fiat money. Even though some studies support the acceptance of cryptocurrencies as fiat money, most studies indicate that cryptocurrencies do not have properties that would make them a sound alternative to fiat money. Since cryptocurrencies have a decentralized structure, their acceptance as fiat money constitutes a high level of risk for the financial system. Losing the ability to create money by states could efface the state's sovereignty and would negatively affect the entire financial system.

There are increasing numbers of improvements happening day by day to extend the availability of cryptocurrencies. The increase in the number of firms that accept cryptocurrencies as payment methods, the increase in the volume of cryptocurrencies, and the increase in the number of cryptocurrency users contributed to the evolution of cryptocurrencies positively. Despite these positive changes, the use of

cryptocurrencies as alternative money has not been achieved yet. The cumbersome structure of confirmation of transactions, high volatility in the price of cryptocurrencies, and threats to the inherent formation of cryptocurrencies which is being decentralized make it hard to subrogate the fiat money.

Of course, increasing interest in cryptocurrencies called attention to international and governmental organizations and/or institutions. Hacking incidents and the influence of cryptocurrencies on countries' economies have been reasons for regulatory institutions to take action. Some of these institutions proposed a definition for cryptocurrencies.

Many organizations or institutions define cryptocurrencies in their way of understanding. European Central Bank (ECB) sees cryptocurrencies as a sort of virtual currency. ECB defines cryptocurrencies as unregulated digital money. ECB distinguishes cryptocurrencies from virtual currencies with the function of the ability to link to the real economy. The link occurs in such types as the acquisition of real goods and services. International Monetary Fund (IMF) classified cryptocurrencies as a sort of virtual currency as well as ECB. IMF defines virtual currencies as the future and the ability to represent worth digitally. World Bank classified cryptocurrency as a kind of virtual currency as well as IMF and ECB. On the other hand, World Bank also classifies cryptocurrencies as digital currencies with the future of its cryptographic technique to manage consensus (Houben and Snyers, 2018).

These institutions' attempts to define and classify cryptocurrencies show that cryptocurrencies are becoming significant in the economic system. Being defined by these institutions means official recognition by them. The technology behind cryptocurrencies constitutes its main future, and these institutions are concerned about the unregulated structure of cryptocurrencies. Since cryptocurrencies are unregulated digital money and have a linkage to the real economy, authorities such as central banks and the department of treasuries pay attention to it. Along with these attempts, important definitions and recognitions are made by regulatory institutions. Such as the Office of the Comptroller of the Currency (OCC) accepted the custody services for cryptocurrency in July 2020 and authorize cryptocurrencies as a payment method in January 2021.

Cryptocurrencies are diffused in the financial system in various types of usages as mentioned before. Even though cryptocurrency issuers and people who created different types of tools for the crypto ecosystem assert all the positive effects of their financial system, these new types of instruments come with serious risks. Their potential impact on the financial system and countries' economies is increasing as their diffusion increase. As cryptocurrencies evolved, governments and financial and regulatory institutions paid attention to them due to their potentially detrimental effects on the economy. The primary characteristic of cryptocurrency is having an anonym structure, and being a decentralized system via excluding third-party institutions to prove the reliability of transactions. Due to the structure of cryptocurrencies, it is challenging to track illicit activities which can affect countries' economies. Furthermore, these characteristics could constitute substantial challenges for governments to conduct independent monetary policies and their ability to control the economy. The main challenge for governments is to monitor cryptocurrency transactions. Due to their anonym structure, transactions with cryptocurrencies cannot be traced by governments. Not being tracked by governments paves the way for managing illegal activities through cryptocurrency transactions. Money laundering, financing terrorism, and hacking activities constitute most of the illicit activities. Even though detecting illicit transactions done by using cryptocurrencies is challenging, there are studies done by researchers and institutions to address these activities. These illicit activities constitute risks to financial stability, monetary policy, consumer protection, and taxation due to the loss of money.

Money laundering via using cryptocurrencies is a substantial challenge for governments. Even though money laundering is discussed by crypto advisors and institutions, there is a conflict in terms of assessing the importance of money laundering via using cryptocurrencies. Governments and international institutions tend to assess the detrimental effect of the crypto-ecosystem and consider money laundering as a substantial problem. On the other hand, crypto advisors focus on the technology behind cryptocurrencies and tend to assess money laundering as a subordinate problem. Their mainstays are the complexity of conducting money-laundering operations with cryptocurrencies and the relatively small amount of volume compared to the whole crypto ecosystem (Money laundering via cryptocurrencies: All

you need to know, 2022). Both points of view have reasonable arguments to support their views. The structure of data makes it challenging to track and detect whether an illicit transaction is made or not via using cryptocurrencies. Although it is challenging, there have been studies to investigate the illicit usage of cryptocurrencies.

One example of using cryptocurrencies for illicit activities is about Deep Web. Bitcoin is used for buying drugs or other illegal things through Deep Web internet sites such as Silk Road. In a study, it is estimated that about 1.2 million U.S. dollars amount of transactions were made with cryptocurrencies on Silk Road monthly during the six months between February and July 2012 (Christin, 2012). In 2013 FBI arrested the creator of the Silk Road and shut down the internet site. FBI announced that it has done sales of illegal materials amounting to over 9.5 million Bitcoins. At that time this amount costs about 1.2 billion U.S dollars (Hill, 2015). In a study, the illicit use of bitcoins was analyzed through data provided by Elliptic[16]. It has resulted that over 500.000 bitcoins being used for money laundering between 2013 and 2016. Almost all of them root in darknet markets. During the period people used mostly exchanges and gambling to launder money. Over half of the illicit usage of cryptocurrencies does not have location info. On the other hand, Europe has 37% of the illicit usage of cryptocurrencies. The most salient result of the study is only %0,61 of the total money came from illicit sources (Fanusie & Robinson, 2018). Foley et al., studied bitcoin transactions between 2009 and 2017 to detect illicit activities related to bitcoin. They used data from 106 million users' transactions that correspond to 1.9 trillion U.S. dollars. They tried different approaches to identify illegal activities of users through using bitcoin. They gather data from darknet forums, marketplaces for illegal activities, and confiscations by regulatory authorities. They used network cluster analysis, and detection-controlled estimation to analyze illicit activities. Their results were threatening to regulatory authorities. According to their results, almost half of the transactions involved illicit activities that correspond to 76 billion U.S. dollars in a year (Foley et al., 2019).

[16] Elliptic is a firm founded in 2013 that provide blockchain analytics for financial crime compliance.

As cryptocurrencies diffused and evolved, opportunities to use them for criminal profits also increased. Different tools open a road for different types of crimes to launder money using cryptocurrency transactions aside from cybercrime. Criminals use cryptocurrency exchanges, P2P trading platforms, services for swapping cryptocurrencies, cryptocurrency cards, Non-fungible tokens (NFTs), Bitcoin ATMs, cryptocurrency mixers, and gambling platforms for illicit activities. Criminals use cryptocurrencies, especially for the illicit drug trade, fraud, and money laundering. Criminals' can obfuscate their identity and the origin of their illicit activities by using cryptocurrencies. The main illicit activity is money laundering related to cryptocurrencies. Criminals use different methods to launder money, such as using them as payment methods for illicit commodities. Using cryptocurrencies as a payment method on the dark web makes them subject to different types of crimes due to the variety of materials that are sold on the dark web, such as sexual abuse and illicit drug. As cryptocurrencies evolved, professional firms that specialized in money laundering. These firms provide services to criminals, such as cashing out or the legalization of illegal assets. More than half of the illicit activities are related to fraud. Also, drug trafficking and using cryptocurrencies as means of payment are common usage of cryptocurrencies for illicit activities. One of the illegal usage cryptocurrencies is related to BTC-e[17]. The criminal investigation conducted in 2017 found that over 4 billion U.S. dollars were used for illicit activities in BTC-e. Another example related to the illicit usage of cryptocurrencies is a scam. In 2021 it was revealed that a platform called Vitae used cryptocurrencies for illicit activities. 223.000 people have invested in cryptocurrencies through Vitae and lost their money. Cryptocurrencies worth 1.5 million euro and 1.1 million euro cash was seized. One more example of a scam that cost people over 30 million euros. Criminals use advertisements of high profits for investment in cryptocurrencies to steal money. All these cases show that criminals tend to use cryptocurrencies and the motivation behind using cryptocurrencies is their anonymous structure of them and easiness of making transactions using them. Even though there is evidence of the usage of cryptocurrencies for illicit activities, the amount of it constitutes a small portion of the cryptocurrencies. Furthermore,

[17] BTC-e is a cryptocurrency exchange platform founded in 2011.

compared the using conventional finance for illicit activities, cryptocurrency usage is smaller (Europol, 2021).

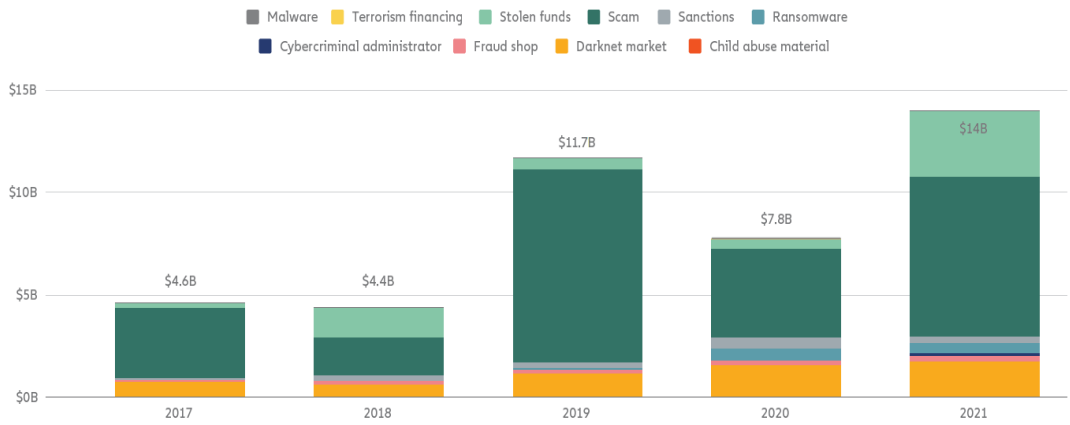


Figure 2.9: Total Amount of Illicit Activities by Using Cryptocurrencies 2017-2021

Source: Chainanalysis, 2022

A comprehensive analysis of illicit activities is done by using cryptocurrencies made by Chainalysis. According to their analysis, illicit activities of cryptocurrencies increased in 2021 and cost about 14 billion U.S. dollars which is the highest amount of all time. The total volume of cryptocurrency transactions reached over 15 trillion U.S. dollars which are far more than the number of illicit activities. Even though the ratio of the value of illicit activities constitutes a small number of all cryptocurrencies, it is still 14 billion U.S. dollars and constitutes a substantial problem. In 2021 higher proportion of illicit activities are rooted in scams and stolen funds. An increase in the Defi transitions contributed to both types of illicit activities. Theft of cryptocurrencies via Defi protocols cost over 2 billion U.S. dollars in 2021. The main aim of criminals is to convert their illicit funds to cash. Because of that, money laundering constitutes the highest proportion of cryptocurrency crimes. Since 2017 criminals have laundered over 33 billion U.S dollars, and in 2021 8.6 billion U.S dollars were laundered using cryptocurrencies. Comparing the amount of money laundered by using fiat currencies, the amount of money laundered by using cryptocurrencies is very small. It is estimated that between 800 billion and 2 trillion U.S dollars of money are laundered in one year (UN Office of Drugs and Crime, n.d., as cited in Chainanalysis, 2022). Comparing fiat currency and cryptocurrency in terms of associating with illicit activities is

challenging due to the offline usage of cryptocurrencies. Even though the total amount of money that is laundered via using cryptocurrencies is hard to detect due to offline usage, the total amount of money laundered via using cryptocurrencies is relatively less than the amount of money laundered via using fiat cryptocurrencies (Chainanalysis, 2022).

Financing terrorism via using cryptocurrencies is another substantial problem for state sovereignty. A woman is tired of financing ISIS through money laundering using bitcoin worth over 85.000 the U.S. dollars. A propaganda group for ISIS also made an announcement to their supporters for funding them via cryptocurrencies. Also, Hamas announced that they receive donations through cryptocurrencies. Furthermore, cryptocurrencies make it easier for international transfers of illicit nuclear, radiological, and biological materials. Criminals use cryptocurrencies even for human trafficking (Ibrahim, 2021).

Up until there have been some studies about cryptocurrencies' effects on the financial system. One group focus on the potential benefits and asses the evolution of cryptocurrencies as favorable innovation. On the other hand, another group focus on the detrimental effects of cryptocurrencies and asses their evolution of them as a significant risk factor for the financial system. In this study, the assessment of cryptocurrencies is more prone to the latter group. Risks arising from cryptocurrencies constitute a significant threat to the financial system, and in the future, part of the thesis the focus on the detrimental effects of cryptocurrencies. Especially in the chapter 3 analysis made for investigating the reason the cryptocurrency adoption and its potentially detrimental effects on the economy of Turkey.

2.5. Cryptocurrency Regulations Around World

Cryptocurrencies' anonym structure makes it easier for criminals to obscure illicit activities from legal authorities and provide an opportunity for cashing illegal worth. As studies show, the amount of money used for illicit activities through cryptocurrencies constitutes a very small portion of whole cryptocurrencies. Even though the proportion is small, it still constitutes a significant amount of money. Besides the amount of money, the existence of illicit usage of cryptocurrencies affects

the countries' economies. Individuals lose their investments, some amount of money goes to the informal economy, and financing terrorism constitutes a risk for nation-states. Due to such effects of cryptocurrencies on countries' economies, regulatory authorities made regulations related to cryptocurrencies or banned them.

In the United States, cryptocurrencies are not considered legal tender. The Internal Revenue Service (IRS) defines virtual currencies as "a digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value", and earnings via using virtual currencies and using them for means of payment could be objected to tax consequences (Internal Revenue Service, 2022). In Canada, cryptocurrencies are not legal tender, and cryptocurrency exchanges are regulated to protect people. Cryptocurrencies can be used as means of payment in stores and have been subjected to tax since 2013. Canada is the first country that regulated exchanges for anti-money laundering (AML) İN 2014. In 2017 the first cryptocurrency investment fund was registered by regulatory authorities and the Bank of Canada described cryptocurrencies as securities. Cryptocurrency exchanges are regulated in the same aspect as conventional money services and need to be registered by legal authorities since 2020. Furthermore, cross-border cryptocurrency transactions are subject to diligence requirements set by legal authorities (Crypto regulations in Canada, 2022). China is one of the countries that have made serious restrictions related to cryptocurrencies. China's first restriction was shutting down local exchanges which constituted 90% of speculative bitcoin trade in 2017. In 2019, cryptocurrencies were banned, and in 2021, institutions that provide services related to cryptocurrencies were banned. On the 24th of 2021, all types of businesses related to cryptocurrencies were noticed as illegal. Furthermore, legal authorities announced that Chinese employees who are working in offshore exchanges would be prosecuted (Brooke, 2021). Together with China, Algeria, Bangladesh, Egypt, Iraq, Morocco, Nepal, Qatar, and Tunisia are countries that banned cryptocurrencies. Furthermore, there are 42 countries which are ban cryptocurrencies implicitly. The reasons behind the ban on cryptocurrencies are their decentralized structure and volatility. Some countries considered their potentially detrimental impact on their monetary systems and took actions like banning cryptocurrencies or cutting off their relationship with the financial system (Bajpai, 2021). In European Union (EU), cryptocurrencies do not consider illegal. Regulations

related to cryptocurrency exchanges differ between member states. Taxation related to cryptocurrencies differs across member states, but most of the member states collect tax from cryptocurrency profits at a rate between 0 and %0.5. The Court of Justice of the European Union declared that the exchange of cryptocurrencies and fiat currency was exempt from VAT[18] in 2015. In 2020, illicit activities, especially money laundering via using cryptocurrencies regulated under the Fifth Anti-Money Laundering Directive (5AMLD). Cryptocurrencies are made obligatory to fulfill Know Your Customer (KYC) and Customer Due Diligence (CDD)[19] requirements. In the same year, cybercrimes have added to the list of predicate offenses in money laundering under the 6AMLD. Regulations related to exchanges differ between member states. In France, Italy, and Germany, regulatory authorities have a requirement for registration for exchanges. Furthermore, 5AMDL and 6AMDL include regulations related to exchanges and exchange firms subjected to broader surveillance in terms of AML controls (Mohsin, 2021). In the United Kingdom (UK), the Financial Conduct Authority (FCA) made negotiations with firms such as large banks and cryptocurrency issuers through a consultation paper in 2019. With the help of feedback, "'Guidance on Crypto-assets Feedback and Final Guidance to CP 19/3" has been published by FCA. Cryptocurrencies are categorized into four different types FCA utility tokens, e-money tokens, exchange tokens, and security tokens. Only the two of them, e-money and security tokens are regulated. Cryptocurrencies are identified in three stages for their regulatory position in the UK. First, firms that are running cryptocurrency-related businesses must be identified by legal authorities. Second, cryptocurrency providers must identify their currencies if they are classified under the specified investments defined in the Regulated Activities Order (RAO) 2001. Third, cryptocurrencies must be identified if they are classified as e-money which is defined under the Electronic Money Regulations (EMR) 2011 (Huang, 2021). El Salvador is the first country a cryptocurrency adopted as legal tender. In June 2021, bitcoin was adopted as legal tender by a new law. In El Salvador, bitcoin is

[18] The Value Added Tax, or VAT, in the European Union is a general, broadly based consumption tax assessed on the value added to goods and services.

[19] KYC and CDD policies are the cornerstone of any AML policy developed in a company and both hinge on the need to verify the identity of the customers that deal with companies affected by AML regulations.

characterized as being means of payment for all agents. Tax for capital gains excludes exchanges in bitcoin. The government of El Salvador announced “Chivo” as a bitcoin wallet with prepaid 30 U.S. dollars to accelerate the adoption of bitcoin by people (International Trade Administration, 2021). Petro is the world’s first state-backed cryptocurrency which was created in 2018. Due to the economic crisis in Venezuela, the government created the Petro as a response to hyperinflation. The Petro is backed by Venezuelan oil and was created for the purpose of accessing international trade. Together with accessing international trade, its potential for providing an increase in financial certainty and economic growth is promoted by the government. Unlike the other cryptocurrencies, the Petro is not totally decentralized, and the Treasury of Venezuela has the authority of conducting operations related to the Petro, such as issuing, distributing, and collecting them. Even though the Petro was created to circumvent U.S. sanctions and stabilize the economy, it could not be a remedy for both economic stability and sanctions (Herrera Anchustegui & Hunter, 2018).

Cryptocurrencies' inherit structure constitutes risks for financial stability and conducting monetary policy. In terms of international regulation, there are challenges for regulators. Differences in the classification of cryptocurrencies by countries obstruct the coordination between countries. One of the challenges is the technology of cryptocurrencies. Their decentralized structure makes it hard to regulate them within traditional regulatory approaches. At the international level, organizations approach cryptocurrencies with regard to both potentially beneficial and detrimental effects. United Nations Office on Drugs and Crime (UNODC) and the Financial Action Task Force (FATF) concentrate on the potential illicit usage of cryptocurrencies, especially money laundering. Their main point of view is to create law enforcement to prevent illicit activities through cryptocurrencies. On the other hand, The Committee on Payments and Market Infrastructures (CPMI) focus on the technology of cryptocurrencies for central banks and their potential for being a means of exchange. Via sharing of information related to cross-border crimes could promote cooperation between jurisdictions (He et al., 2016).

2.6. Conclusion

Since the invention of bitcoin, cryptocurrencies have been diffused worldwide increasingly, and the crypto ecosystem has become a new phenomenon among people. At the early stage of the crypto ecosystem, cryptocurrencies are used as means of payment, and people tend to use them more for illicit activities due to their anonym structure. The interest in cryptocurrencies peaked in 2017 worldwide, and after the steady interest, in 2021, it increased again. As the crypto ecosystem evolved, cryptocurrency usage diffused enormously, and it is estimated that the number of users will reach one billion at the end of 2022. As cryptocurrencies became so popular, risks and benefits related to them started to discuss. There are two different viewpoints related to cryptocurrencies. The first view focuses on the innovation of cryptocurrencies in the financial system. They assert that risks arising from cryptocurrencies constitute a small portion of the whole ecosystem. The second view makes the risks and potential detrimental effects of cryptocurrencies the focal point. Mainly regulatory authorities take part in the second view. It is true that risks related to cryptocurrencies, especially illicit usage, correspond to a small portion of the whole ecosystem, but when the value of the money used in illicit usage is assed with separately from the proportion, it constitutes a substantial risk to users and countries. Another risk of cryptocurrencies is the volatility in their price. Bitcoin dominates the whole cryptocurrency ecosystem, and due to its dominating position, the volatility in the price of bitcoin is analyzed. It is concluded that the price of bitcoin is highly volatile and constitutes a high level of risk to users. There are many regulations made in different countries to protect users and economies from the potentially detrimental effects of cryptocurrencies. Furthermore, in some countries, cryptocurrency usage is banned due to its detrimental effects. There is only one country that accepts bitcoin as legal tender to prevent economic problems special to its economy. When the approach of governments is assessed, it is concluded that cryptocurrencies are considered a substantial problem for state sovereignty. Moreover, there are attempts to create international regulations to protect the international financial system. Due to the existence of differences in terms of cryptocurrency regulations in different countries and the complexity of creating regulations within the context of conventional

regulatory approaches, there are no regulations related to cryptocurrencies at an international level.

CHAPTER 3

CRYPTOCURRENCIES IN ADVANCED AND DEVELOPING COUNTRIES

3.1. Introduction

Since the invention of bitcoin in 2008, various other cryptocurrencies have been invented, and people have paid more attention to cryptocurrencies as time passed. As cryptocurrencies become widespread all around the world, various investors take an interest in the cryptocurrency ecosystem. An increase in the daily trade volume, the number of cryptocurrencies, and the number of cryptocurrency exchanges indicate that there is a significant interest in cryptocurrencies by investors. In this chapter, it is aimed to investigate the main motivation of people who are interested in cryptocurrencies in developed and developing countries and the potential impacts of cryptocurrencies on economies. Cryptocurrency user numbers, percentage of users in the population, and types of users differ between country groups. Along with the distributional differences in terms of investor types, there are structural differences between countries. The distinction between countries in terms of economic structure and adoption level of cryptocurrencies constitutes benefits and risks particular to each country. Countries that have less developed financial systems and fragile economies could get more benefits from the high level of cryptocurrency adoption via improving financial inclusion. On the other hand, these countries could suffer more than developed countries via being exposed to cryptocurrency penetration in their economies. If a certain amount of money moves to cryptocurrencies, the prevalence of official institutions controlling money could decrease. If that happens, it makes the developing countries' already less developed economies even worse. The strong institutional structure of developed countries makes it easier to manage risks associated with cryptocurrencies. Also, most of the potential benefits of

cryptocurrencies have a less significant impact on developed countries due to the relatively less ground for financial development and not needing different cryptocurrency practices to be alternatives.

In this chapter it is aimed to answer such research questions below:

What is the reason behind the growing tendency to invest in cryptocurrencies in both developed and developing countries?

What are the determinants of cryptocurrency diffusion in advanced and developing countries?

Who are the investors of cryptocurrencies in both developed and developing countries?

Is there a difference in terms of the profile of investors between developed and developing countries?

What are potential risks and benefits that can be occurred related to cryptocurrency adoption in developed and emerging market economies (EME)?

3.2. Global Outlook of Cryptocurrencies

Due to the decentralized structure of the cryptocurrency ecosystem, data related to cryptocurrencies depends on volunteering. Data relying on volunteering cause standardization and reliability problems. At the time of the research, there was no reliable institution that provided reliable data related to the cryptocurrency ecosystem. Due to the lack of reliable data, analyses to understand the characteristics of the cryptocurrency ecosystem in different countries depend on “unreliable” data. On the other hand, even though the data is “unreliable”, it is the sole source to perform analyses, and it provides sensible information taking into account the economic aspects of the countries.

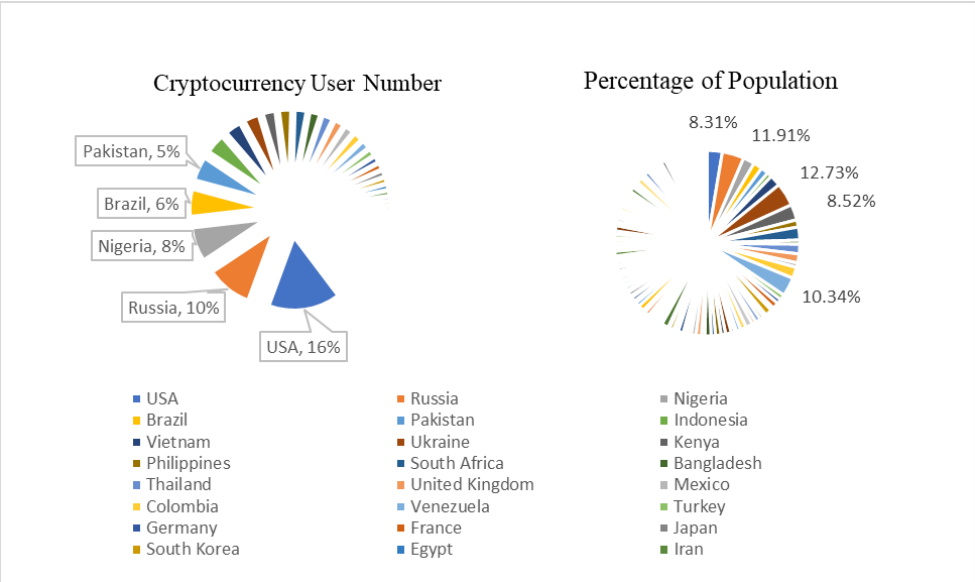


Figure 3.1: Distribution of Cryptocurrency Owners by Country

Source: Author's calculation based on data from triple-a.io[20]

According to data from triple-a.io, there are nearly 173 million cryptocurrency users all around the world. As seen in figure 3.1, the USA has the highest share of cryptocurrency users among countries, with a total number of 27,4 million users. The USA is followed by Russia, Nigeria, Brazil, and Pakistan with the total number of users in sequence 17,3 million, 13 million, 10,3 million, and 9 million. On the other hand, even though the USA has the highest number of cryptocurrency users among countries, it is not in the first place in terms of cryptocurrency users as a percentage of the total population. Figure 1 shows that Ukraine has the highest number of cryptocurrency users in terms of percentage of the population, with a ratio of 12,73%. Ukraine was followed by Russia, Venezuela, Kenya, and the USA with ratios of 11,91%, 10,34%, 8,52%, and 8,31% in terms of the percentage of their population in sequence.

Distribution of the number of cryptocurrency users and their percentage in the population are notable indicators to distinguish and compare the characterization of the cryptocurrency ecosystem in different countries. To be able to investigate the

[20] Data is available at https://triple-a.io/crypto-ownership/.

cryptocurrency ecosystem in different countries, it is beneficial to look at the distribution of the investor types in the cryptocurrency market.

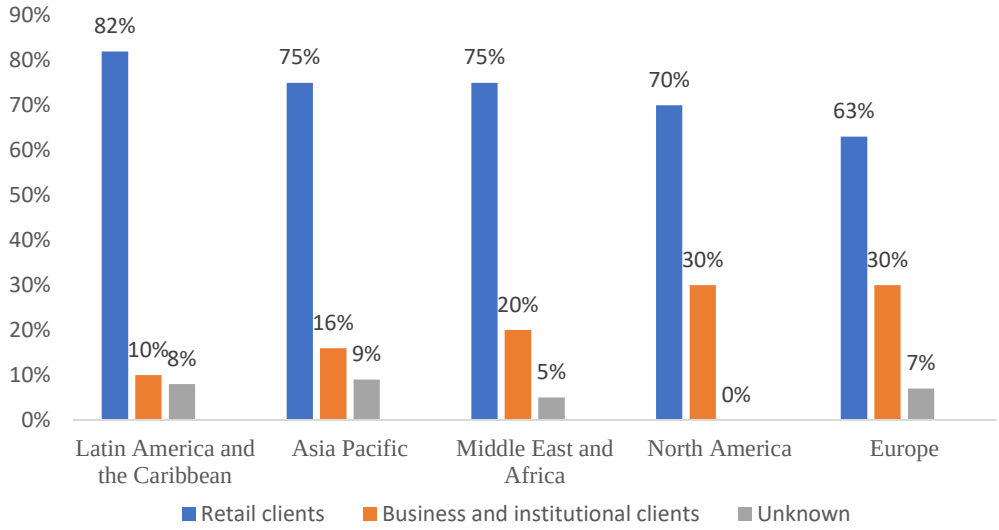


Figure 3.2: Customer Type of Cryptocurrency Investors

Source: (Blandin et al., 2020, p.46)

As seen in figure 3.2, retail clients constitute most of the cryptocurrency investors in the world. On average, 73% of the investors are retail clients and 21,2% of investors are business and institutional clients, and 5,8% of the investors are unknown. As seen in figure 2, business and institutional investors are relatively high in North America and Europe. Retail clients are relatively high in Latin America, Asia Pacific, and the Middle East. Since most developed countries are in Europe and North America, it is understood that big institutions put more attention on cryptocurrencies and invest more in developed countries than developing ones. The Source of the cryptocurrency investments of business and institutional clients are salutary indicators to determine the motivation behind the investments.

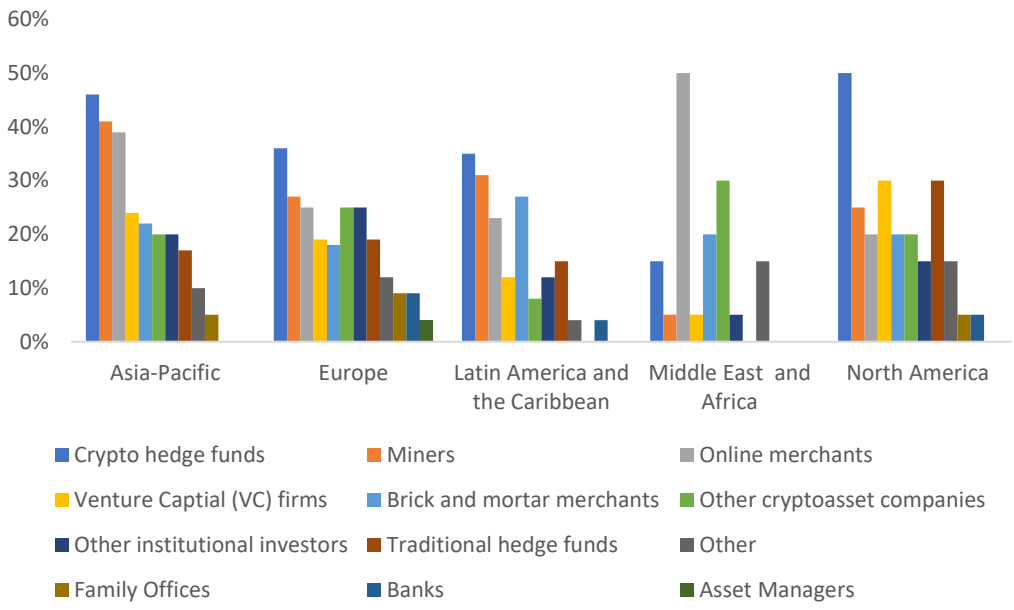


Figure 3.3: Business and Institutional Clientele by Region

Source: (Blandin et al., 2020, p.47)

Figure 3.3 shows the composition of different types of business and institutional investors in different regions. Hedge funds constitute the main proportion of the cryptocurrency service, with 37% of the global share. Online merchants and miners follow the hedge funds with a ratio of 30% and 27% globally. As seen in figure 3, crypto hedge funds are the source of 50% in North America and 46% in the Asia-Pacific. On the other hand, online merchants constitute the highest source of crypto services for business and institutional clients in the Middle East and North Africa. Especially in North Africa, Europe and Asia-Pacific, there is a tendency to invest in cryptocurrency by traditional investors such as hedge funds and venture capitalists. On the other hand, service providers serve more than other crypto asset companies and online merchants in Latin America and the Middle East, and Africa. In terms of service to miners, the Asia-Pacific region has the highest share among the five regions, with a ratio of 41%. According to Blandin et al., the main contribution to mining activities in the Asia-Pacific region is arisen by China. Miners' motivation is to liquidate their coins into their national currencies via service providers to use their coins for expenditures that are fiat currency based. Another relationship between coin miners and service providers is collateralization. Miners use their coins for collateralization

and reach additional funds. Also, mining actors use Asian exchange platforms actively, and in 2019, a huge proportion of bitcoins which is 28%, were transacted into exchanges by mining pools, and these flows did not distribute equally between exchanges. The top ten cryptocurrency exchanges had received a significant number of bitcoins which are 77% of all exchanges (Blandin et al., 2020).

The cryptocurrency ecosystem is increasingly evolving as time passes, and as mentioned above, there are significant differences related to cryptocurrency evolution in developed and developing countries. As cryptocurrencies are evolved, potential benefits and risks also evolve, and differences in terms of adoption level, user types, and usage of cryptocurrencies differ among country groups affected countries at different levels. For distinguishing the potential effects of cryptocurrencies on the economies of countries, the risks and benefits arising from cryptocurrencies are going to be investigated.

3.3. Potential Risks and Benefits of Cryptocurrencies to the Economies

As cryptocurrencies evolve, their impacts on the economy have grown, and cryptocurrencies started to draw attention. People put more interest in them to take advantage of making an investment in cryptocurrencies. The increase in curiosity about cryptocurrencies created different types of products related to them. Numerous applications, crypto exchanges, and crypto-related businesses have been established and have become part of the daily life of a serious amount of people. Together with all these products, the crypto ecosystem became a significant system in terms of impacts on the economy. It has both beneficial and detrimental impacts on the economy. Both effects can be assessed from the view of users' and regulatory institutions' aspects. Users' perspective is prone to concentrate on the beneficial side since they use them as an investment tool. Even though users generally assess cryptocurrencies in terms of their positive aspects, they can be affected by cryptocurrencies harmfully. The main risks for users are lost due to high volatility, fraud, and hacking incidents. On the other hand, regulatory organizations make the detrimental side the focal point due to the anonym structure of cryptocurrencies and their overall impact on the authority of the regulatory organizations. Such benefits and risks related to cryptocurrencies are shown in the table below.

Table 3.1: Potential Benefits and Risks of Cryptocurrencies

Potential Benefits	**Potential Risks**
Compensation for the lack of institutional organizations	Financial stability risk
Increase in the financial integration	Cyber safety risk
Reduction of the institutional corruption	Operational risk
Lowering the transaction costs	Market integrity risk
Providing transparency and accountability via precluding third-party institutions	Governance risks
Contributing to the catching-up process for developing countries	Hacking and fraud risk
Providing microcredits and insurance	Cryptoization risk
Increase in financial inclusion	

Source: Author's Compilation

Such risks and benefits occur at different degrees in different countries. The level of impact on the economy is determined by the potential area of influence. The potential impact of cryptocurrencies on countries' economies fundamentally changes with the level of regulations related to cryptocurrencies. If regulatory organizations ban all the activities associated with cryptocurrencies, most of their potential impact on the economy does not occur. Along with the level of regulations, economic dynamics particular to each country can determine the level of impact. Lack of macroeconomic stability and strong financial institutions in developing countries constitute a significant difference between advanced and developing countries. In developed countries, there is less room for the potential impacts of cryptocurrencies on countries' economies. Since there are no serious problems related to the economy, people in advanced countries do not show interest in cryptocurrencies as much as in developing countries. The low growth rate of gross domestic product (GDP), high level of unemployment, inflation, and currency depreciation cause a higher interest in cryptocurrencies in developing countries. People approach cryptocurrencies as an alternative tool to protect their savings and gain far too much profit than conventional

investments. Another important parameter is the adoption level of cryptocurrencies in each country. Despite the fact that there are regulative, macroeconomic, and institutional differences between advanced and developing countries, the most important factor that affects the impact of cryptocurrencies on countries' economies is the level of adoption by people.

Even though cryptocurrencies and their acceptance by people bring benefits, in companies with their occasions, they involve certain threats in terms of financial stability. The total market capitalization of cryptocurrencies was around 0,5 trillion U.S dollars in November 2020 and has grown incrementally and reached over 2.5 trillion U.S. dollars in May 2021. Even though it decreased during the summer of 2021, it remained at over 2 trillion U.S. dollars in October 2021[21]. The rapid evaluation of the total market capitalization of the cryptocurrencies within only one year gives a hint about their diffusing level. The diffusing pace is important in terms of their risk-associated impact level since new formations in the crypto ecosystems could be lacking in moral structure due to their decentralized nature.

Financial stability risks that arise from cryptocurrencies can be originated from data reliability, cyber safety, issues about stablecoins, and country-specific problems such as cryptoization. Since the crypto ecosystem has drawn attention increasingly, transaction activity has also increased. The lack of advanced systems capable of providing proper service for high transaction activity in the crypto ecosystem sets off operational risks. Hacking incidents especially related to cryptocurrency exchanges and the anonym structure of cryptocurrencies, constitute cyber and governance risks. Due to the attacks on the crypto ecosystem and the low level of transparency related to the issuance of cryptocurrencies, investors could lose their assets. The concentration of cryptocurrencies in certain exchanges and the concentration of the investment in certain cryptocurrencies also constitute risks for investors. Since the crypto ecosystem cannot be surveilled by an authority, investors could suffer from fraud incidents, and lack of surveillance constitutes a market integrity risk. The unregulated structure of the crypto ecosystem enables an opportunity for anybody to create a cryptocurrency without any limitations. This limitless freedom about the creation of cryptocurrency

[21] Data available at : https://coinmarketcap.com/charts/

allows people to demonetize their cryptocurrency whenever they want. This freedom structure enables to exist even more unreliable cryptocurrencies, denominated as meme tokens, via the contribution of social media. Also, the leverage level in the crypto exchanges can up to be 125 times the investment. Considering all these properties of the crypto ecosystem, it can be really detrimental for investors. Decentralized Finance (DeFi) products contain more risks since their products can be less transparent and the lack of cryptocurrency exchanges in the DeFi products makes the rug pulls easier[22] (IMF,2021, p.45-46).

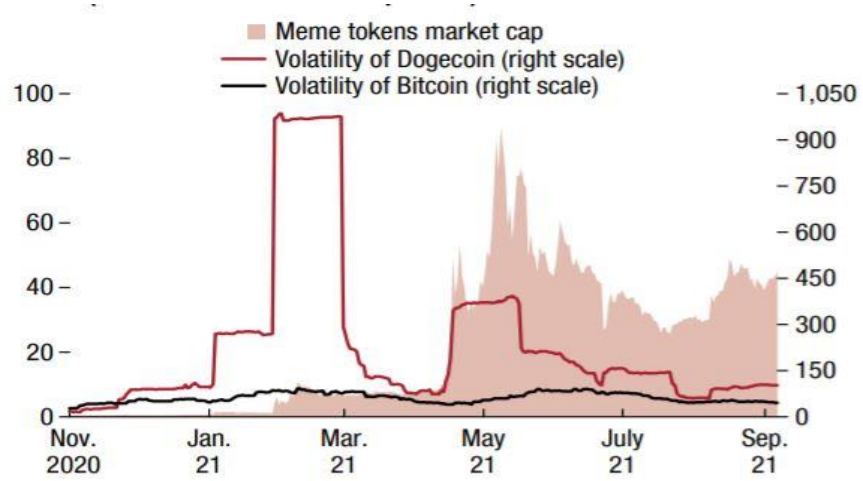


Figure 3.4: Market Capitalization and Realized Volatility (Billions of U.S. dollars and percent)

Source: IMF Global Financial Stability Report 2021(p.46)

It is sooth to say that the lack of an advanced system for the high level of transactions in the crypto ecosystem constitutes a major risk for people. Especially considering the number of fraud and hack-related incidents, the belief that cryptocurrencies have operational risk is reasonable. The biggest cryptocurrency exchange Binance[23] faced only one hack incident, and the exchange has covered the hacking incident in full[24].

[22] Rug pull is a type of scam where developers abandon a project and take their investors' money.

[23] https://coinmarketcap.com/tr/rankings/exchanges/

[24] https://www.binance.com/en/support/announcement/360028031711

Also, Binance suspended the cryptocurrency withdrawals due to a backlog problem[25] on the 11th of November 2021. Even though Binance covered the loss of cryptocurrencies in the exchange, suspending withdrawals embodies the idea that the cryptocurrency ecosystem has operational risk. Furthermore, operational risk can be considered a crucial problem when bearing in mind that Bitcoin is relatively safer than other exchanges in favor of its leading position.

Within all these risks, the anonymity of cryptocurrencies constitutes the major risk due to the high level of non-traceable transactions. Cryptocurrency issuers provide data that are partial and limited. Also, information related to the cryptocurrency ecosystem is based on volunteering. Providing data based on voluntariness cause a standardization problem. Since there is not any standardization of data, tracing the information about cryptocurrencies is complicated. Analyzing information about transactions that are not made in exchanges is challenging, and most illicit activities such as money laundering and financing terrorism take place via on-chain transactions[26]. Furthermore, cryptocurrency issuers prefer to operate their activity in offshore financial centers, which pave the way for illicit activities via providing relaxed conditions about the regulatory framework (IMF, P.47).

[25] https://twitter.com/binance/status/1455137004333711364

[26] On-chain transactions are recorded and verified on a blockchain. Off-chain transactions take place on a specific platform (for example, a crypto exchange) and not on the blockchain.

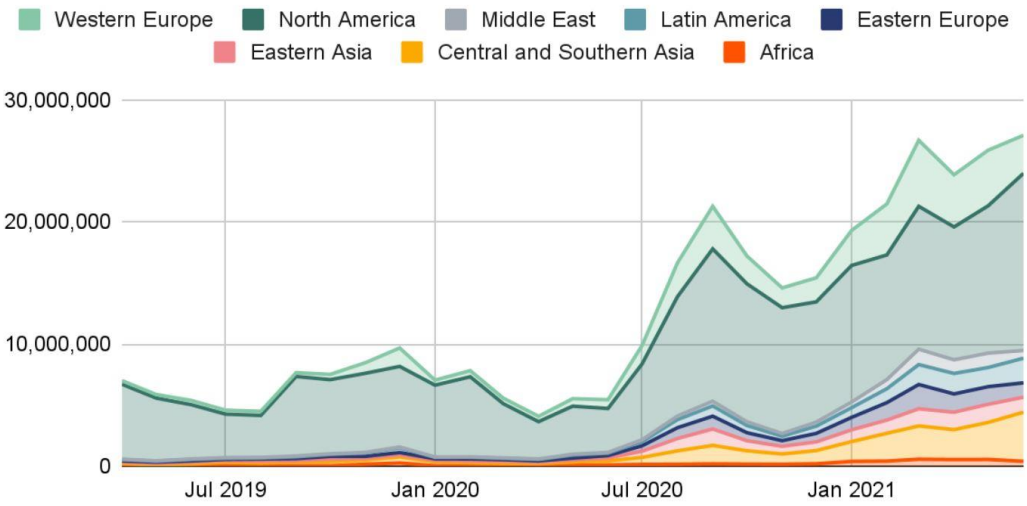


Figure 3.5: Monthly Web Visits to Defi Platforms by Country (April 2019-June 2021)

Source: Chainanalysis[27]

As shown in the study, cryptocurrencies are highly volatile assets which is an important problem in terms of carrying out the medium of exchange and storage of the value function of money. To prevent such problems, some cryptocurrency issuers attempted to stabilize their cryptocurrencies in several ways. One of the main reasons to create a stablecoin is that mediate between cryptocurrencies and countries' fiat currencies. There are three main work models for stablecoins to stabilize their value. The first model works by collateralizing to treasury bills or fiat currency which is generally the U.S. dollar due to its reserve money position. The second model works by collateralizing to another cryptocurrency, and the last model works by using algorithms to stabilize their value (Investopedia, 2021)[28].

As seen in figure 3.5, investors in Western Europe and North America dominate the usage of DeFi platforms. As shown in the study, in these regions, institutional investors are more than retail investors. It can be interpreted that institutional investors prefer making transactions via using DeFi platforms. That tendency to DeFi platforms by institutional investors sparked off the necessary requirement for more stable

[27] https://blog.chainalysis.com/reports/2021-global-defi-adoption-index/

[28] https://www.investopedia.com/terms/s/stablecoin.asp

cryptocurrencies since transactions of institutional investors require more stable cryptocurrencies; the emergence of stablecoins increases correlated with the increase in the usage of DeFi platforms.

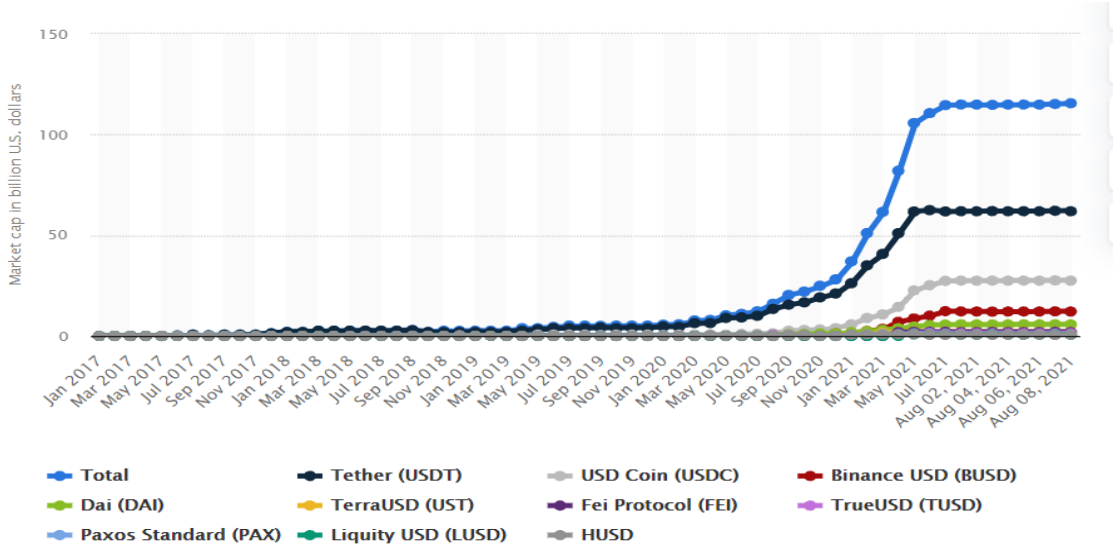


Figure 3.6: Evolution of the Market Capitalization of Stablecoins

Source: Statista[29]

As seen in figure 3.6 especially starting from the end of 2020, there is a boost in stablecoin usage. Even though there is an increase in the usage of stablecoins, they are mainly functioning as a bridge between non-stable cryptocurrencies and fiat currencies, as collateral for derivative transactions, and using in Defi. They are not used for mainstream payment methods yet, but their potential for reaching retail investors could create a problem for the financial system in terms of the trust. If one of the stablecoins gets a high level of adoption all around the world and begins as a means of payment cross-border it can become a global stablecoin (GSC). Since they are decentralized currencies, the potential of GSC poses a paramount risk to financial stability (FSB, 2021). Some stablecoin-related incidents demonstrate how potential risks could occur. The New York Attorney General's office announced that:

> In the case of Tether, the company represented that each of its stablecoins was backed one-to-one by U.S. dollars in reserve. However, an investigation by the

[29] https://www.statista.com/statistics/1255835/stablecoin-market-capitalization/

> Office of the Attorney General (OAG) found that iFinex — the operator of Bitfinex — and Tether made false statements about the backing of the "tether" stablecoin, and about the movement of hundreds of millions of dollars between the two companies to cover up the truth about massive losses by Bitfinex. (N.Y. Attorney General, February 2021[30])

Investigations such as the above show that even though there are some attempts to create more reliable cryptocurrencies, they are doubtful due to their anonymity structure. Since there is no proper disclosure about stablecoins, the lack of crucial information about stablecoins makes them unreliable against fiat money. Another important risk of stablecoins is concentration. In August 2021, the total market capitalization of the stablecoins had reached over 115 billion U.S. dollars, and the market capitalization of Tether had reached 62 billion U.S. dollars[31]. The market capitalization of the Tether corresponds to about 54% among all stablecoins. This concentration constitutes a potentially high level of contagion risk if an investor runs in one country. Considering the evolution of stablecoins, they could affect the movement of commercial papers, which is crucial for the financial market (IMF, 2021).

[30] https://ag.ny.gov/press-release/2021/attorney-general-james-ends-virtual-currency-trading-platform-bitfinexs-illegal

[31] https://www.statista.com/statistics/1255835/stablecoin-market-capitalization/

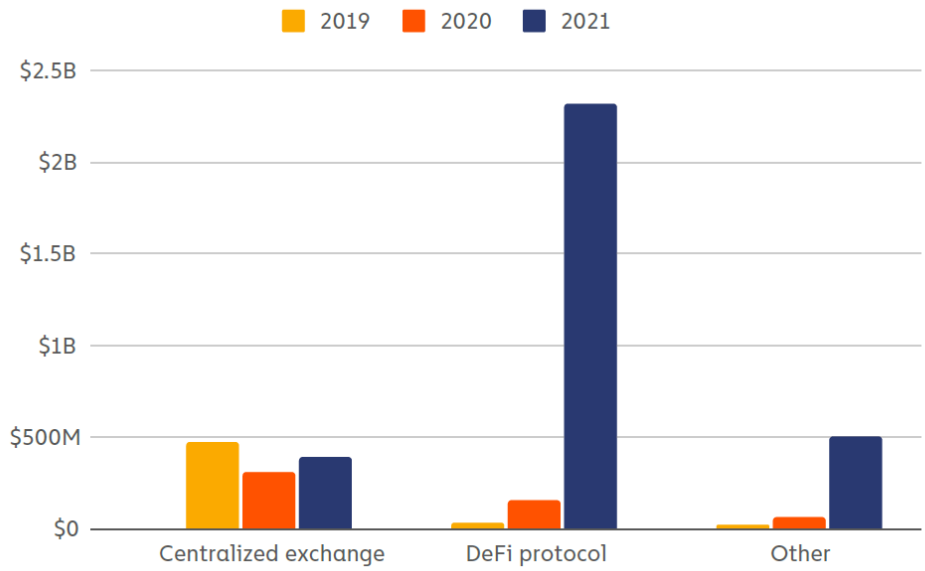


Figure 3.7: Annual Total Cryptocurrency Stolen by Victim Type (January 2019-December 2021)

Source: Chainanalysis, 2022, p.6

As seen in figure 3.7, the amount of stolen cryptocurrency from DeFi protocols significantly increased in 2021. Even though the attempt to stabilize the price of cryptocurrencies sounds beneficial, it also has a significant detrimental effect. Considering increased interest in stablecoins and DeFi protocols in 2021, the detrimental effect of the increase in the emergence of stablecoins is substantial.

The main determinant of the influence level of effects by cryptocurrencies on economies is the regulations made by governments. Impacts of cryptocurrencies increase in line with the lack of regulations. As long as a country allows to penetrate cryptocurrencies into its financial system, the probability of getting potential benefits and being exposed to risks increases. Arguments related to the potential beneficial and detrimental effects of cryptocurrencies on economies are more pertinent to developing countries than to advanced countries. Especially the potential benefits of cryptocurrencies are subject to developing countries. There is no need for augmentation of financial inclusion or other benefits by cryptocurrency usage in advanced countries. The most important reason for being a subject to benefits for developing countries is the difference between these countries in terms of the need for different cryptocurrency products. Having an advanced financial system does not

require different varieties of cryptocurrency practices in advanced countries. Being exposed to the risks that occurred by cryptocurrencies is similar to getting benefits from cryptocurrencies for developed and developing countries. Developing countries expose more risks related to cryptocurrencies because of the existence of more practices of cryptocurrencies. Yet there are risks for both countries regardless of their economic differences. The cyber safety risk, fraud, hacking incidents, and risks related to stablecoins constitute a substantial hazard for both country groups. Due to the different types of needs, people approach cryptocurrencies differently in advanced and developing countries. Another important parameter that determines the impact level of cryptocurrencies is the usage differences of people in country groups. Proportional differences in users in terms of being retail or an institutional investor bring about different practices of cryptocurrencies in advanced and developing countries. The higher proportion of retail investors in developing countries accelerates the different practices of cryptocurrencies. Different cryptocurrency practices increase their level of impact on countries' economies.

3.4. Usage Differences and of Cryptocurrencies in Advanced and Developing Countries

The potential effects of blockchain technology and the crypto ecosystem on the economy are more considerable in less developed countries than in advanced ones. Since the lack of strong institutional organizations is more significant in less developed countries, blockchain technology and the crypto ecosystem could more easily affect these countries' economies. They could positively affect less developed countries by compensating for the absence of strong institutions. There is more possibility for cryptocurrencies to contribute to economic growth in some developing countries, such as by using them as a property right service, increasing financial inclusion, and reducing institutional corruption, especially in Africa. On the other hand, the lack of strong institutional organizations in less developed countries paves the way for the crypto ecosystem to negatively affect these countries' economies. The lack of strong institutions makes it easier to substitute domestic economic units for the crypto ecosystem. In the situation of a significant amount of diffusion of the crypto ecosystem

on the economy, it is possible for regulatory organizations to lose the ability to control the economy due to the absence of strong institutionalization.

Schmidt and Sandner asserted that blockchain technology could be a remedy for development problems in developing countries. In underdeveloped countries, weak institutions are one of the main problems beneath poverty. Weak institutions cause a trust problem in society which increases economic deterioration. A low level of access to financial services constitutes one of the main problems in underdeveloped countries. Financial integration can help to increase domestic savings and reduce the dependence on international capital. Problems inflicted by weak institutional structures can be mitigated with the help of blockchain technology. Ownership of a property is legalized when it is documented officially. Blockchain technology helps people for confirmation of property ownership which increases the conditions of living. Poor people and small enterprises could benefit from blockchain technology with its impact on liberating capital. In underdeveloped countries, the transparent structure of cryptocurrencies allows people to expose their rights on their property. Property legalization with blockchain technology is crucial for especially African countries. It is easier to legalize with blockchain than current procedures in African countries. Also, exchanges know that it is needed for people to reach internet access to use blockchain technology for the registration of property. Exchanges provide internet infrastructure in the African continent, which is another positive effect of blockchain technology in underdeveloped countries. Another benefit of blockchain technology is enhancing financial inclusion. Cryptocurrencies can easily use by everyone with the help of easy procedures such as no requirement for identification. Cryptocurrencies can be alternate to traditional payment methods with lower transaction fees. Also, people who want to protect themselves from inflation in national fiat currency and who are not able to transfer their money to stronger currencies can use cryptocurrency to overcome inflation (Schmidt & Sandner, 2017).

It is true that cryptocurrencies have the potential to contribute to financial integration. Financial integration could be beneficial in terms of creating a connection between the local financial market and foreign investors. On the other hand, since cryptocurrencies have an anonym structure, tracing the crucial information about the investors could be

an important problem for the local financial markets. When the potentially detrimental effects of cryptocurrencies are considered, the benefit of getting a property right is limited due to the legal regulations. Regulations for getting a property right via using cryptocurrencies are much more complicated than using cryptocurrencies as an investment tool or for other purposes. Also, it seems that getting a property right by using cryptocurrencies huddles around African countries. Since African countries suffer from institutional corruption and lack of financial development more than other parts of the world, getting a property right is not noticeable when the diffusion of cryptocurrencies is considered. Moreover, getting a property right is less influential to the economy than the other impacts of cryptocurrencies.

An increase in financial inclusion can be seen as a positive impact on the economy when it is assessed as access to financial services. On the contrary, accessing financial services via cryptocurrencies could affect the entire economy perniciously. When cryptocurrencies are used as an alternative to local fiat currency, banks could be excluded from the financial system, and that situation could create a financial crisis. Also, when people use them as an alternative, central banks or regulatory organizations could lose their control over the economy.

Global South countries experienced new kinds of transformation with developing technologies such as the Internet of Things (IoT) and blockchain technology. Blockchain technology is important to reduce corruption and fraud in these countries. Blockchain technology has been used in various types in the African continent. In South Africa, a startup called Bankymoon gave an opportunity to public schools to benefit from utility credits using blockchain technology. People can contribute to South African schools' electricity needs by donating with the help of Bankymoon at lower transaction costs. Another important benefit of blockchain technology in less developed countries is about property rights. In less developed countries, paperwork for property registration is costly and complicated due to the corruption of institutions. In Hondurans, a very little proportion of people have legal proof of holding property, and the majority of them are not registered. Lack of records of property rights causes conflict about property use. In 2015 a start-up called Fatcom made an agreement with the Honduran government to use blockchain technology to keep land registries. Also,

the Georgian government made an agreement with a company called Bitfury to use blockchain technology for registering land names. With the help of blockchain technology cost of the public registry in the property, trade is expected to be reduced to around 0,1 U.S dollar which corresponds to a thousand times less compared to the public registry. Another benefit of blockchain is reducing the cost of money transfers. Remittance cost for immigrants are crucial since immigrants' income level is already low. Companies like Bitspark, Bitsoko, and mexBT aim to be an alternative to money transfer companies that provide their service at high costs. Bitspark lowers the remittance cost by about 1% in Hong Kong and allows people in the Philippines who receive bitcoin to convert it into local fiat currency pesos. Bitsko also provides money transfer services using bitcoin in African countries such as Uganda, Rwanda, Zimbabwe, and Ghana. MexBt provides a service for international money transfers between Asia and Latin America using bitcoin and allows people to make payments in local currencies. Another benefit of using blockchain is transparency with the help of IoT. With the help of IoT, it is easier to detect damages to things that are insured, and with the help of blockchain, technology damages can register to the system easily. For example, Saldo.mx, which is a Mexican payment platform, provides insurance services using blockchain technology. China is one of the most important countries in the Global South in terms of using blockchain technology. Chinese firms use blockchain technology in various industries such as insurance, and global trade. Baidu is a search engine firm in China that made an agreement with U.S based blockchain company called Circle to provide payment services using bitcoin, especially international payments. Another incident in China about the diffusion of cryptocurrency is an agreement of technology firms over thirty on using blockchain for insurance, security exchange, and banking. For example, Walmart uses blockchain technology to track the location of food which are from China to improve the safety of foods (Kshetri, 2017).

Reducing the cost of international money transfers is an important attribute. This attribution could be assessed bilaterally. A lack of trusted institutions could make transactions cheap, and users can save money by using cryptocurrencies. Nevertheless, the lack of trusted third-party institutions makes it easier for fraud incidents. If people all around the world get used to making a transfer via

cryptocurrencies, it could increase the appetite for fraud or hacking. Besides the probability of fraud, another important risk is network congestion during high-frequency transactions. When transactions cannot be done due to technical problems, the benefit arising from low cost does not matter. The usage of blockchain technology for utility credits or property rights is limited to a few countries. Since blockchain technology and cryptocurrencies use more as investment tools in large-scale countries, the benefit that emerged from using them as providing utility credits and property rights is scant.

In a working paper by Holtmeier and Sander, the advantages of cryptocurrencies for developing countries are aligned as precluding trusted third parties from interaction and providing transparency and accountability, which are reinforcing trust between users. The lack of intervention by governments allows cryptocurrencies to trade all over the world without being stuck in restricted areas. Trading cryptocurrencies with no restriction allows making a small amount of financial transfer at a low cost. On the other hand, cryptocurrencies have certain features that can be negative, such as providing ease to people to transfer illegal money or finance terrorism. Also, high volatility in the price of cryptocurrencies is detrimental to making contracts with cryptocurrencies. Lack of governmental impact on cryptocurrencies perceived as thereat by some governments and some developing countries banned cryptocurrencies from the financial system, reducing the advantages of cryptocurrencies in those countries. One of the reasons for poverty in developing countries is the less financial inclusion of people. Also, the lack of participation in worldwide trade constitutes another problem. Social trust problems in developing countries restrain economic growth. With increasing interest in cryptocurrencies, internet usage and internet-related technological innovations have increased in developing countries. Especially in the Sub-Saharan Africa region, that effect is more visible. Cryptocurrencies enable the exchange of local fiat currencies to the US dollar or another fiat currency faster since some local fiat currencies suffer from a lack of liquid market to exchange. Cryptocurrencies provide easiness to join international trade via the abolition of the necessity of bank account, which positively affects developing countries' economies. Also, people use cryptocurrencies as the quasi-bank account, which boosts the financial system's inclusion in developing countries. Another aspect of the benefit of

cryptocurrencies in developing countries is microcredits. Since cryptocurrencies have the ability to decrease the transaction cost of transferring money between individuals, cryptocurrencies can use as an alternative to microfinance which is expensive due to high transaction costs. The benefits of cryptocurrencies in developing countries are still progressing since the technology behind them is not advanced. One of the crucial requirements to benefit more from cryptocurrencies is the necessity for mass adaptation by people. Also, cryptocurrencies are needed to support politics to enhance the level of adaptation. But governments were faced with the loss of financial sovereignty when cryptocurrencies became popular, and some countries regulated the usage of cryptocurrencies. A solution to the loss of financial sovereignty is creating digital currencies which are issued by central banks (Holtmeier and Sander, 2019).

The benefits of cryptocurrencies in developing countries are relatively different from each other as well as other financial innovations due to the distinctive characteristics of countries' economies. Taking advantage of cryptocurrencies for developing countries depends on various parameters such as level of financial development, average education level, the institutional structure of the country, political environment, etc. In the African continent, countries are relatively less developed than other developing countries in the world. Their position in terms of economic development makes it easy to benefit from any innovation more than other developing countries.

The diffusion of technology via cryptocurrencies in the African continent contributes to the catching-up process for developing countries in Africa. The main positive contribution of cryptocurrencies to African countries is increasing the level of financial inclusion. For other developing countries banking system is more inclusive than in African countries, which paves the way for cryptocurrencies to affect more positively. The empirical result of analysis based on surveys and interviews indicates that a low percentage of the African population has a formal account in financial institutions, which is 40% of the total adult population. Another result from the study is that; the account holding percentage increases with the line of increased education. One of the study results shows that only half of the primarily educated people have an account, which is very low compared to people who have a university education and have an

account is 92%. The first thing to join the financial system is, to have an account. Opening a bank account is a huge problem in African countries, whereas it is very easy in developed countries. The diffuseness of bank branches is less in African countries, which increases the cost of opening an account. Cryptocurrencies provide a solution for obstacles in opening a bank account via the allowance of mobile procedures. Also, costs arising from the necessity of physical branches of banks and financial institutions make it hard to open an account. On the other hand, cryptocurrencies allow opening accounts with only the necessity of an internet connection, contributing to financial inclusion in Africa. In Ghana, non-governmental organizations use Bitland exchange for land management issues which are critical in Ghana due to its economic structure. In Ghana, the vast majority of people in rural areas are not officially registered. Cryptocurrencies allow people to ensure ownership. Also, in 2017 over 300 start-ups originated in Africa, and Ghana constitutes an important position to attract start-ups with the diffusion of usage of cryptocurrencies. Cryptocurrencies provide opportunities for investment and create an alternative way of finance in Africa. Even though the cryptocurrency ecosystem is still growing in Africa, it is important for social development. Both private and public institutions could reduce the level of inequality and contribute to economic development by avoiding conflicts about cryptocurrencies in Africa (Mavilia & Pisani, 2019).

In a study, Lammer M.D et al., investigated the profile of both cryptocurrency investors in Germany using 31 cryptocurrency and related assets, and non-cryptocurrency investors between 2014 and 2017. Cryptocurrency investors manage more money than non-cryptocurrency investors. Also, the male population dominates the cryptocurrency investors with over the 90% ratio and an average age of investors is 47. Cryptocurrency investors tend to trade more frequently than non-cryptocurrency investors and the volume of the portfolio is greater. One important result from the study is that investors who include cryptocurrencies into their portfolios tend to have investment biases like trend chasing. Study findings show that cryptocurrency investors tend to interest more in their financial situation and their view of cryptocurrency investment can be anticipated as an entertainment activity. Also, cryptocurrency investors use tech-related tools and mobile apps. The portfolio activity

of cryptocurrency investors increases after the initial investment whereas non-cryptocurrency investors perform steadier (Lammer D.M et al., 2019).

Assessing the cryptocurrency investment as an entertainment activity can be considered an allusion to the cryptocurrency ecosystem. As we know, people show interest in cryptocurrency more day by day, but the reason is not apparent. It is possible that the users of cryptocurrencies do not understand their structure of them. If this is the situation, then all the beneficial aspects of them can be considered as a fallacy.

Cryptocurrencies are generally used for making investments in both advanced and developing countries. Their lack of being able to carry out all functions of money is the main motive behind using them as an investment tool. Besides the general usage of cryptocurrencies globally, there are some differences between advanced and developing countries. In developing countries, the diversity of cryptocurrency usage is more than the advanced countries. The absence of sufficient financial development in developing countries triggers the different forms of cryptocurrency usage. Even though cryptocurrencies do not carry out all functions of money and using them for other purposes than making investments comes with high risks, people in developing countries use them for many purposes. Especially in less developed countries in developing countries, diversity of usage is more visible. Using cryptocurrencies for gaining property right service, getting micro-credits, and improving internet and electricity infrastructure is more common in African countries. Usage differences between developing countries other than African countries are less visible. Using them for transferring money as a tool for tracing food and insurance is the difference between developing and advanced countries. On the other hand, in advanced countries, the usage of cryptocurrencies is concentrated on being an investment tool. The potential effects of cryptocurrencies differ between advanced and developing countries due to the lack of advanced financial systems and institutional organization in developing countries. Some basic development indicators such as the number of bank branches, trusted institutions, services for the approval of property rights, etc. have already been reached by advanced countries, whereas some developing countries are still suffering from a lack of these basic necessities. The potential impacts of cryptocurrencies on the economies of developing countries have more room due to the

lack of developed financial systems and strong institutional organizations. Their absence paves the way for different types of usage, and as usage diversifies, the potential impacts of cryptocurrencies increase. Cryptocurrencies and blockchain technology have the potential to compensate for these needs and contribute to both economic and social development, providing services such as insurance, microcredits, and sending remittances at a lower cost. Furthermore, cryptocurrencies have an encouraging effect on the diffusion of internet services and start-ups related to cryptocurrency. The biggest contribution of cryptocurrencies to developing countries' economies is increasing financial inclusion. Some studies assert that less financial inclusion has a significant negative effect on poverty in some underdeveloped countries and cryptocurrencies could reduce poverty by contributing to financial inclusion. Moreover, cryptocurrencies could contribute to developing countries' economies by attaching them to global trade with the feature that making transactions fast and at a lower cost. As well as all the other benefits of cryptocurrencies, financial inclusion is more significant in African countries than in other developing countries due to their position in terms of economic development. On the other hand, the lack of strong institutional organizations and the existence of corruption make it easier to affect developing countries detrimentally cryptocurrencies. Cryptocurrencies find positions to compensate for local financial structures in developing countries due to the absence of a developed economy. Furthermore, if cryptocurrencies evolve sufficiently, they can substitute the local financial structures in developing countries owing to the lack of economic development. In the situation of substitution, developing countries could be affected destructively by the reason of losing the capability of controlling the economy by regulatory organizations. Peculiarly, the most harmful scenario is the loss of the capability of affecting the economy by central banks due to the substitution of fiat currencies for cryptocurrencies. Link up international trade with cryptocurrencies constitutes a threat to the legitimacy of the U.S. dollar as being reserve money for international trade. Their decentralized structure constitutes a substantial risk for all countries. Since the volume of international trade is exorbitant, the risk of fraud is very high. For advanced countries, it looks like cryptocurrencies using as a medium of exchange and investment tool, and other effects which contribute to developing countries' economies could not exist since there is no lack of

institutional organizations or services to compensate by cryptocurrencies. Also, the strong institutional organizations in advanced countries buffer the potential adverse effects of cryptocurrencies. As mentioned before, data about the users show that people show interest in cryptocurrencies in developing countries more than in advanced ones. The strong institutional organizations in advanced countries cause the needlessness to show interest in cryptocurrencies for retail investors. The high proportion of institutional investors in Europe and North America assists that assessment. Institutional investors show interest in cryptocurrencies to diversify their portfolios rather than to protect their savings. On the contrary, the higher proportion of retail investors in developing countries can be linked to the assessment of cryptocurrencies as a remedy for depreciation in the local currencies. The potential effects of cryptocurrencies on the economy and diversification of usage are higher in developing countries. The important reason behind that is the difference between advanced and developing countries in terms of financial and institutional development. While the advanced countries buffer the potentially detrimental effects and limit the potential benefits of cryptocurrencies in favor of their developed economies, the lack of economic development paves the way for the potential benefits and harm of cryptocurrencies in developing countries.

3.5. Adoption of Bitcoin and Other Cryptocurrencies in Developed and Developing Countries

All these effects of cryptocurrencies on both advanced and developing countries' economies highly depend on the adoption level of the cryptocurrencies. As the adoption level increases, people use cryptocurrencies more in their financial necessities, which could show more positive effects. On the other hand, high adoption level paves the way for the challenges related to cryptocurrencies. Even though there are many other determinants of the potential impacts of cryptocurrencies, the adoption level is one of the main factors.

Cryptocurrencies have challenges in terms of efficiency in developing countries due to high price volatility, technological structure, and being a target of hacking incidents. Inefficiencies of cryptocurrencies constitute an obstacle to the adoption of cryptocurrencies in developing countries. Getting used to cryptocurrencies requires of

involvement of many institutions in developing countries. High price volatility of cryptocurrencies consequence that governments of developing countries approach to cryptocurrencies being doubtful as payment methods. In the period between August 2010 and July 2016, bitcoin was inefficient due to price volatility. Volatility in cryptocurrencies makes it hard to benefit from cryptocurrencies' positive effects effectively and makes it disadvantageous for developing countries. Since developing countries have unstable economies in general, it is not easy to adopt cryptocurrencies with high inefficiency (Kankanam Pathiranage et al., 2020).

According to a study by Chainalysis, 19 of the top 20 countries are EMEs based on their cryptocurrency adoption index[32]. Their research shows that adoption in EMEs roots in peer-to-peer (P2P) platforms. The increasing adoption in these countries mainly occurred due to the desire for protection against currency depreciation. Other reasons that exacerbated the adoption are carrying out remittances and making commercial transactions. On the other hand, 43% of the global value of cryptocurrencies is sent by other countries to North America and Central, Northern, and Western Europe during 2020 and 2021. These regions include most of the advanced countries of the world. The position of being the biggest counterparty to developing countries indicates that investors in developing countries liquidate their cryptocurrencies in advanced countries. In North America and Europe, institutional investors' transactions constitute the majority of transfers, and they use Defi platforms more than centralized exchanges. The DeFi adoption index[33] data shows that the tendency to adopt DeFi platforms is dominated by middle-income and high-income countries. In these countries, the higher proportion of investors is institutional investors, which differs from the developing countries (Chainalysis, 2021).

[32] In the study three metrics are used for creating the cryptocurrency adoption index score. Metrics depend on total activity of cryptocurrency, measurement of the cryptocurrency users and volume of the Peer-to-peer (P2P) exchange

[33] In the study three metrics are used for creating the DeFi adoption index score. The three components of the index score are on-chain cryptocurrency value received by DeFi platforms weighted by PPP per capita, individual deposits to DeFi platforms, and Total retail value received by DeFi platforms

Table 3.2: Geographic Breakdown of Internet Visitors (Unique visitors, October 2020–June 2021)

Economies	BINANCE	HUOBI	COINBASE	KRAKEN	FTX	BITHUMB	BITFINEX
Top economy 1	Turkey	China	United States	United States	Turkey	Korea	Russia
Top economy 2	Russia	Ukraine	United Kingdom	Germany	Korea	Russia	Taiwan Province of China
Top economy 3	United Kingdom	Vietnam	Spain	France	China	Turkey	Germany
Top economy 4	Brazil	United States	Germany	United Kingdom	Taiwan Province of China	United States	Ukraine
Top economy 5	Argentina	Russia	France	The Netherlands	Hong Kong SAR	Poland	Brazil

Exchange

Source: IMF GFR, 2021

As seen in table 3.2, top economies are mainly EMEs referring to unique internet visitors. The number of unique internet visitors is a significant index to measure the interest level of people by country. The visitation numbers show the interest level, but it gives relatively tacit information since its purpose is not known. Since there is no information about the number of transactions, the number of unique visitors cannot be directly associated with the adoption level. The data is consistent with the other studies asserting that the proportion of retail investors is higher, and they tend to use centralized exchanges in developing countries.

Given the size of the adoption level, cryptoization could affect the countries' economies. As seen in the figure, the top countries in terms of visiting the biggest cryptocurrency exchanges are EMEs. High adoption levels in EMEs could be originated from the lack of strong macroeconomic policies and shortcomings in the financial system. Central banks' policy stance and deficiency in the banking systems stimulate the deterioration in the local currency. In such an environment, people can pursue a safer asset to store their domestic value. Together with possible restrictions on the exchange rate, the cryptocurrency ecosystem can be the remedy for overcoming the deterioration in the local currency. Additionally, underdeveloped payment systems trigger the adoption level of cryptocurrencies via their ability to serve fast and cheaply. Based on the level of cryptocurrency adoption, monetary policy, fiscal policy, and

capital flows can be affected arrantly. If cryptoization reaches a certain level, the effectiveness of the central banks' monetary policy could decrease, and cryptoization could pose financial stability and liquidity risks. Tax evasion could be decline due to the high level of cryptoization, and fiscal policy could be affected. Another risk of the high level of cryptoization is arising from being an alternative system to domestic banks. If it happens, the financial system as a whole could be affected very harshly and countries may run into a state of necessity for taking strong precautions (IMF, GFR, P.52-53).

Krause made an empirical analysis to understand the derivatives behind the adaptation of bitcoin in both developing and developed countries. He tried to estimate the adaption of bitcoin by making the number of downloaded software by bitcoin clients in selected countries as a dependent variable. To understand what drives bitcoin usage, he used regressors such as financial openness and inflation and has done the study for 21 countries. One of the important results of the study is that: inflationary circumstance affects the usage of bitcoin positively. Results of the study indicate that bitcoin adoption is negatively related to financial openness, having a bank account, and financial openness (Krause, 2016).

Parino et al. tried to understand the main factors that explain the adoption of bitcoin in different countries. They used bitcoin transaction information and other external sources to explore socioeconomic factors behind the adoption of bitcoin. They observed that developed counties are pioneer adopters of bitcoin which shows that attention to bitcoin was already high at the beginning of bitcoin in developed countries. Contrary to developed countries a huge number of developing countries are less desire to adopt bitcoin. They calculated Spearman's correlation coefficient for chosen socio-economic indexes for one year. According to the results, bitcoin adoption is positively correlated with the human development index, internet penetration, and GDP per capita, and negatively correlated with inflation. They concluded that socioeconomic prosperity stimulates the bitcoin adoption, which is sensible to explain the higher adoption in developed countries. Also, other important indexes are trade freedom and overall freedom to explain bitcoin adoption. Both of these indexes are positively correlated with the bitcoin adoption according to the results. They concluded that

adoption trends are heterogenous in the world, where bitcoin growth is higher in most developed countries and less in developing countries. They also created a gravity model to calculate bitcoin flows and according to the model results freedom of trade, population, and GDP per capita indexes are most significant to determine bitcoin flow (Parino et al., 2018).

Stensås et al. investigated the investors' approach to bitcoin in developed and developing countries. They classified the role of bitcoin in three categories which are being a safe haven, a diversifier or a hedge. They used the DCC-GARCH model to investigate the correlation between assets over time for selected countries. They have resulted that investors in developed countries approaching to bitcoin as a diversification tool rather than as a hedge tool. On the other hand, in developing countries such as India, Russia, and South Korea investors approached to bitcoin as strong hedge and in Brazil they approached bitcoin as weak hedge. Being a hedge option of bitcoin can be sourced by the lack of trust in governments and financial system in developing countries. During the shocks investors in both developed and developing countries approach to bitcoin in similar way to not be as safe haven. They resulted that the highest capacity for being a safe haven for investor occurred in Zimbabwe. In U.S bitcoin approached as strong diversification tool to other commodities as well as in other developed countries (Stensås et al., 2019).

Greyscale is an asset management firm for digital currencies, and it made an online survey to 1000 U.S consumers[34] to research the importance of bitcoin for investors in 2020. According to the result of the study, 55% of the investors are interested to invest in bitcoin, and 83% of the respondents have made their investment in the last year to the time of the study. Also, 38% of the participants have made their investment in bitcoin within the last 4 months and 63% of them indicated that Covid-19 had an impact on their investment decision. Demographic distributions of participants who invested in bitcoin are the important result of the study. 29% of participants are graduate degree holders, 22% of them are undergraduate holders, and investors of

[34] "All respondents were between the ages of 25 and 64 and had primary or shared responsibility for household financial decision-making. All respondents were involved in some form of personal investing, with at least $10,000 in household investable assets (excluding workplace retirement plans or real estate) and at least $50,000 in household income" (Greyscale,2020,p.2).

bitcoin with no college degree is 17%. Male investors are more than female investors with a ratio of 31% and 15% in sequence. Also, the highest share of the age distribution of bitcoin investors is the scale between 25 and 34. According to the result of the study bitcoin investors in the U.S clustered in the profile employed young males. The main motivation behind the bitcoin investments stated by participants that the easiness of invest bitcoin. Bitcoin investment allows people to invest small amounts and it is easier than other types of investment such as bonds, and stocks since there is no requirement for purchasing a significant amount for bonds and stocks. People can buy any amount of bitcoin like very small amounts which give more freedom space for making an investment. Also, participants indicated that bitcoin's growth potential is another motivation to invest in bitcoin. 58% of participants who invested in bitcoin asserted that they invest in bitcoin more comfortably if they are more educated about bitcoin. 63% of the participants indicated that covid-19 impacted their decision for investing in bitcoin, and 83% of the bitcoin investors in the participants asserted that they make investments in assets that are considered a safe haven for them. Older people in the participants tend to not be interested in bitcoin due to its volatility, and 84% of the participants indicated that the risk level of bitcoin is too much for including it into their profile (Greyscale, 2020).

Park et al., tried to understand the information flow relationship between bitcoin and other assets to evaluate the function of bitcoin being an asset. They used government bonds, stock index, bitcoin price, and exchange rates of 27 countries to investigate the relationship between bitcoin and other variables. They resulted that information flow from bitcoin to other assets is relatively less than from other assets to bitcoin. They found empirical results in developed countries to support that pattern but in merging marker economies they could not find the same empirical results. According to their results, other financial assets influenced bitcoin in both developed and developing countries. The impact of other assets on bitcoin is more in developed countries than in developing ones. Also, countries' exchange rates are more affected the bitcoin than other indexes such as government bonds (Park et al., 2020).

Tamphakdiphanit and Laokulrach made a survey-based analysis to indicate the factors that drive the use of bitcoin in Thailand in 2020. They applied the survey to 214

participants and used the “Unified Theory of Acceptance and Use of Technology (UTAUT) Model” (Sarfaraz, 2017, as cited in Tamphakdiphanit, J., and Laokulrach, M, 2020). They investigated the effects of social influences, performance, expectancy, facilitating conditions, and effort expectancy. According to their results, 70 of the participants are between the ages of 18 and 24 ages, and 74 of them are between the ages of 25 and 24. In total 67,3% of the participants are younger than 35 years old. Their results showed that over half of the participants hold bachelor’s degrees and 29% of them hold master’s degrees. 40,6% of the participants invest through bank deposit which is the most accessible option to use for investment. Their results showed that participants who were familiar with bonds and debentures as investment tools tend to use cryptocurrencies more than others which is 75,6% of the participants. According to their regression analysis, social influence has the most positive effect on behaviors of the cryptocurrency users. The social influence variable affects the behaviors of users with the 0,493-beta coefficient where beta coefficients of performance expectancy are 0,111, effort expectancy is 0,121, and facilitating conditions negatively affect the behaviors of users with the -0,178-beta coefficient. Users in Thailand generally see cryptocurrencies as an alternative investment tool and their social environment is highly effective on their behavior such as their friends, and colleagues. Also, participants who are not familiar with cryptocurrencies are being away from cryptocurrencies due to their complex structure (Tamphakdiphanit, J., and Laokulrach, M, 2020).

One of the important studies on consumer adoption of bitcoin was made for Chinese citizens. Survey-based research using the Technology Acceptance Model (TAM) which includes the perceived usefulness and perceived ease as main constructs (Roca et al., 2006, as cited in Nadeem et al., 2021). Nadeem et al. added “transaction processing and security and control” as other parameters to modify TAM (Nadeem et al., 2021). Their study was applied to 385 participants to test 6 hypotheses. According to their results, 61,8% of their participants are male and 38,2 of them are female. Participants' age distribution occurred as 63,6% of 20-30 years, and 33,5% of 31-40 years. Also. 61,8% of participants are master’s degree holders and 22,1% of them are bachelor’s degree holders. They found that perceived ease of use affects bitcoin usage and it has an impact on perceived usefulness. Another parameter that has an effect on

perceived usefulness is transaction processing. Also, their result support that perceived usefulness constitutes a mediation role between bitcoin usage and perceived ease of use relationship. They could not find a statistically significant impact of security and controls on perceived usefulness. Perceived usefulness affects positively the intention of bitcoin use (Nadeem et al., 2021).

3.6. Conclusion

Cryptocurrencies are one of the novel topics in economics, and their impact on the economy evolves day by day. Their diffusion pace is increased starting from 2019, and at the time of the study, they have reached almost every country in the world. As they evolved, numerous practices of them emerged and started to affect countries' economies. Cryptocurrencies could contribute to the economy in some senses and bring about substantial detrimental impacts on the economy. The most addressed benefit of cryptocurrencies is providing financial inclusion. Other benefits of them are relatively negligible to financial inclusion when their impact level of them is considered. Potential detrimental impacts of them are more prominent than the benefits of them. Potential beneficial and detrimental impacts on them the economy come into question more for developing countries due to the more room to penetrate. Even though the level of impact of cryptocurrencies is higher in developing countries, beneficial impacts are more peculiar to developing countries. The existence of a strong financial system in advanced countries makes it redundant to get benefits from cryptocurrency practices. Similar to getting benefits from cryptocurrencies, being exposed to the detrimental effects of cryptocurrencies is more significant for developing countries. On the other hand, particular detrimental effects of cryptocurrencies are relevant for both advanced and developing countries. Especially risk that could be occurred exclusive to stablecoins, and hacking incidents affect both country groups. The potential impacts of cryptocurrencies on the countries' economies depend on different parameters. The foremost determinant of the level of impact is the different regulatory frameworks related to cryptocurrencies in different countries. Regularities determine the level of penetration of cryptocurrencies into the financial system and the diffusion of them in a country. Also, regularities determine the number of cryptocurrency practices. Another determinant of the diffusion and impact level of

cryptocurrencies is the usage differences. The tendency of people to use cryptocurrencies for different practices affects the potential impact on them on the economy. The higher tendency of using cryptocurrencies for different practices in developing countries increases the level of being affected by cryptocurrencies. Usage differences are related to the proportion of users in terms of being an institutional or retail investors. In advanced countries presence of a higher proportion of institutional investors limits the experience of different cryptocurrency practices. Besides these parameters, one of the considerable parameters is the adoption level of cryptocurrencies in different countries. Determining the adoption level of cryptocurrencies is a complicated process due to the reliability of data. In certain studies, some proxies are used to calculate the adoption level, such as the number of visits by individual people to exchanges. Some studies create metrics to calculate the adoption level of cryptocurrencies. Some studies are made with survey-based analysis, and some studies use different indicators to conduct econometric analysis to calculate the adoption level of cryptocurrencies in different countries. The dominant result of these studies is the higher adoption level of cryptocurrencies in developing countries. All the parameters that determine the potential impact of cryptocurrencies on countries' economies support the presence of a higher impact of cryptocurrencies in developing countries. Since the potential benefits of cryptocurrencies are less visible within developing countries, considering that most of them are peculiar to less developed African countries, the potentially detrimental effects of cryptocurrencies surpass their beneficial impact.

CHAPTER 4

ADOPTION OF CRYPTOCURRENCIES IN TURKEY

4.1. Introduction

As discussed in the earlier chapters, cryptocurrencies have aroused attention increasingly since the invention of bitcoin all around the world. Even though interest in cryptocurrencies increases day by day, there have been two significant boosts in terms of interest in cryptocurrencies since the invention of bitcoin. The first considerable attention was in 2017 and was mostly associated with developed countries. The second noticeable attention to cryptocurrencies occurred in 2021. After the first attention to cryptocurrencies, awareness of people in developing about cryptocurrencies increased, and cryptocurrencies became more popular in developing countries. Turkey is one of the significant countries in terms of putting attention to cryptocurrencies. The evolution of cryptocurrencies in Turkey has proceeded similarly to other developing countries, and Turkey is one of the countries that are the "latecomers." The fundamental interest in cryptocurrencies occurred in 2021 in Turkey. When Turkey is compared to similar developing countries in terms of being a "latecomer" country, it has resulted that common macroeconomic structures such as a high level of currency depreciation could be the reasons behind the interest in cryptocurrencies in similar developing countries. As discussed in the first chapter, cryptocurrencies are highly volatile, and volatility in the price of cryptocurrencies constitutes a high level of risk to consumers. Furthermore, being subject to illicit activities such as money laundering and scams constitute a substantial risk to investors. In spite of the volatility in cryptocurrencies, people pay attention to them in Turkey. According to the estimation of Statista, Turkey is the 4th country in terms of

cryptocurrency users[35]. In December 2021, the Turkish Lira became the most traded fiat currency with Tether worldwide, and the amount of trade surpassed the amount of trade with the dollar and euro[36]. A preliminary study indicates that the motivation behind the extraordinary tendency to invest in cryptocurrencies is related to the economic instability in Turkey. As stated in the second chapter, the lack of strong institutional organizations increase the potential impact of cryptocurrencies on the economies in developing countries. In recent years Turkey has experienced a high level of currency depreciation, and people tend to keep their savings in foreign currencies. According to the Central Bank of the Republic of Turkey (CBRT) statistics,[37] the share of foreign exchange deposits in the total deposits is above 58% as of the 1st of April 2022. As mentioned above, people have traded cryptocurrencies more than foreign exchanges in Turkey, which constitute a cryptoization risk. As concluded in the second chapter, alongside the institutional differences, regulations made related to cryptocurrencies are another determinant of their potential impact on them the countries' economies. In Turkey, one of the biggest frauds in the crypto ecosystem occurred in April 2021, which cost over 2 billion U.S dollars. This amount of fraud made cryptocurrencies the focal point of regulatory organizations, and there have been made various regulations related to cryptocurrencies in Turkey. Cryptocurrencies are not legal tender, and earnings from cryptocurrency investments are not subject to any kind of tax. To elaborate on the motivation behind the high level of cryptocurrency adoption in Turkey and investigate the reason for being a "latecomer" country position of Turkey, a survey-based analysis is made. Survey questions are designed to investigate the behavior of people who use and continue to use cryptocurrencies, those who stopped to use them, and who have never used them before. Six hypotheses are tested by a structural model using data from participants who used and continue to use cryptocurrencies and those who stopped to use them to underline the factors of cryptocurrency adoption in Turkey. Descriptive statistics are used for investigating the behavior of all groups of people.

[35] https://www.statista.com/statistics/1202468/global-cryptocurrency-ownership/
[36] https://www.bloomberght.com/turk-lirasi-tether-islemlerinde-birinci-oldu-2296426

[37] https://www.tcmb.gov.tr/wps/wcm/connect/173b7dec-d6c6-4727-9f51-82e0f4138560/Para_Banka.pdf?MOD=AJPERES&CACHEID=ROOTWORKSPACE-1

It has investigated such questions in this chapter:

How have cryptocurrencies evolved in Turkey?

What is the regulatory organizations' position on cryptocurrencies in Turkey?

Why do people put interested in cryptocurrencies in Turkey?

What is the distribution of investors in terms of being an individual or institutional type?

What are the potentially detrimental effects of cryptocurrencies on the economy of Turkey?

4.2. Cryptocurrency Evolution in Turkey

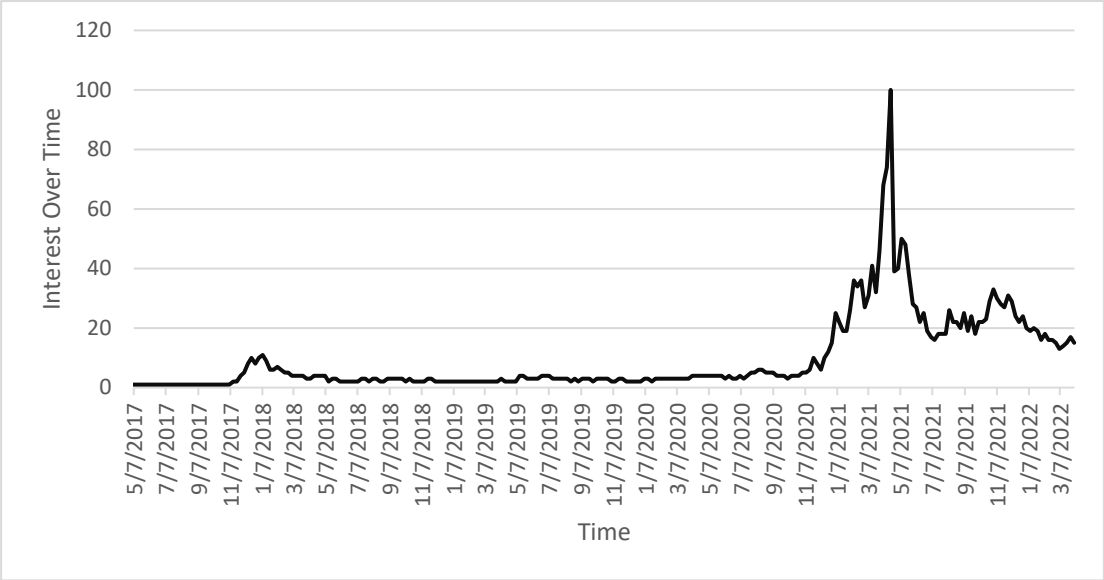


Figure 4.1: Interest in searching "Kripto Para" on Google[38]

Source: Google Trends[39]

[38] "Kripto Para" means "Crypto Money" in Turkish. The numbers show search interest relative to the highest point on the chart for a given region and time. A value of 100 is the term with the highest popularity. A value of 50 means the term is half as popular as that. A value of 0 means that there is not enough data for this term.

[39] Data derived from https://trends.google.com/trends/explore?date=today%205-y&geo=TR&q=%2Fm%2F0vpj4_b

As seen in the figure, actual interest in cryptocurrencies started at the end of 2020 and reached the maximum in April 2021 in Turkey. Interest in cryptocurrencies in other countries has begun earlier than in Turkey, as shown before. As seen in the figure, people in Turkey put more interest in cryptocurrencies during the period of the Covid19 pandemic domination. Since each country has its own distinguishing economic structure, interest in cryptocurrencies in Turkey could be affected by issues peculiar to Turkey's economy. On the other hand, since the Covid19 pandemic requires extraordinary restrictions all around the world, economic activity in Turkey is affected negatively by these restrictions as well as in other countries. That effect could be one of the significant reasons which stimulate the interest in cryptocurrencies in Turkey. As shown in the first chapter, the first jump in interest in cryptocurrencies occurred in 2017, and the second jump occurred in 2021 worldwide. It is understood that people in Turkey caught the second wave of attention to cryptocurrencies. Since google search data shows just the curiosity of people about cryptocurrencies, it is beneficial to investigate the number of cryptocurrency users in Turkey.

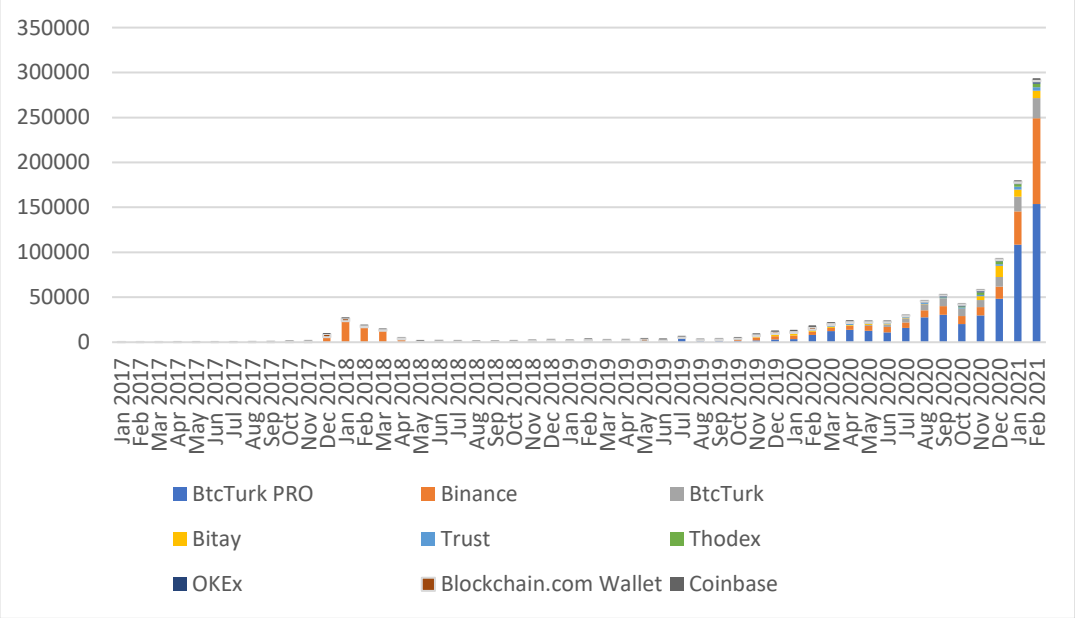


Figure 4.2: Average Number of Daily Cryptocurrency Users in Turkey

Source: Data sourced from Statista[40]

[40] Data available at: https://www.statista.com/statistics/1222485/most-popular-cryptocurrency-wallets-turkey/

As seen in figure 2 number of daily cryptocurrency users in Turkey based on selected cryptocurrency exchanges made its first surge at the end of 2017. That surge is related to the increasing popularity of bitcoin and other cryptocurrencies in 2017. During the early period of interest in cryptocurrencies, investors in Turkey attention to Binance as an exchange platform. Compared to the second increase that occurred in 2021, it is understood that people did not use cryptocurrencies commonly in Turkey until the end of 2020. After the first surge, the interest in cryptocurrencies calmed down and continued steadily during the next two years. Starting from the end of 2019, the number of daily users escalated again and reached nearly three hundred thousand in February 2021. As seen in the figure, domestic cryptocurrency exchanges emerged along with the rise in daily users. BtcTurk Pro and Binance have reached over fifty hundred thousand and nearly one hundred thousand daily users in February 2021. BtcTurk Pro, a domestic cryptocurrency exchange, dominates the cryptocurrency exchange market with more than half of all daily cryptocurrency users. Both Google search data and the number of daily cryptocurrency users indicate that cryptocurrencies have become more popular in Turkey later than happened worldwide earlier. Assessing Turkey's catch-up process together with similar developing countries gives information about the position of being a "latecomer" country.

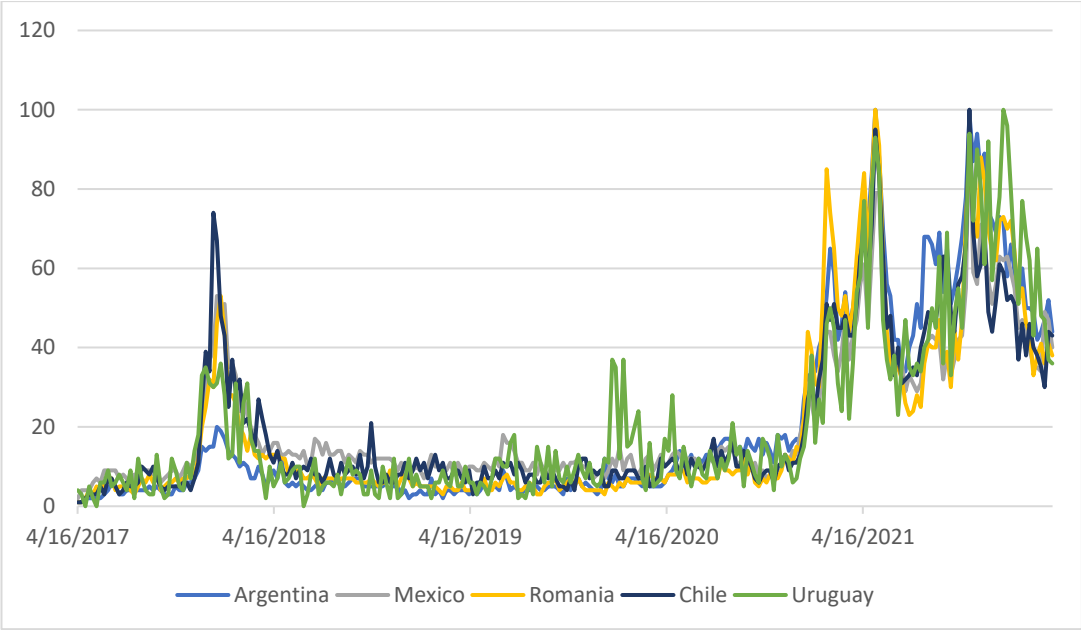


Figure 4.3: Interest in searching "Cryptocurrency" on Google[41]

Source: Google Trends

As seen in figure 3, the highest interest in cryptocurrencies in selected developing countries occurred in 2021 and in 2022. Data indicates that there was more interest in cryptocurrencies in selected countries than in Turkey during the first increasing interest around the world in 2017. Even though there is a difference between the selected countries' and Turkey's experience in terms of catching the first wave of interest in cryptocurrencies, the similarity of catching the second wave is conspicuous. Similar to Turkey's experience, attention to cryptocurrencies from people in selected developing countries has peaked in the second wave of attention to cryptocurrencies around the world.

After the global pandemic, many countries experienced economic instability. As seen in the figure above, actual interest in cryptocurrencies occurred during the global pandemic period. One of the common experiences in selected countries is currency depreciation, especially since 2020.

[41] The numbers show search interest relative to the highest point on the chart for a given region and time. A value of 100 is the term with the highest popularity. A value of 50 means the term is half as popular as that. A value of 0 means that there is not enough data for this term.

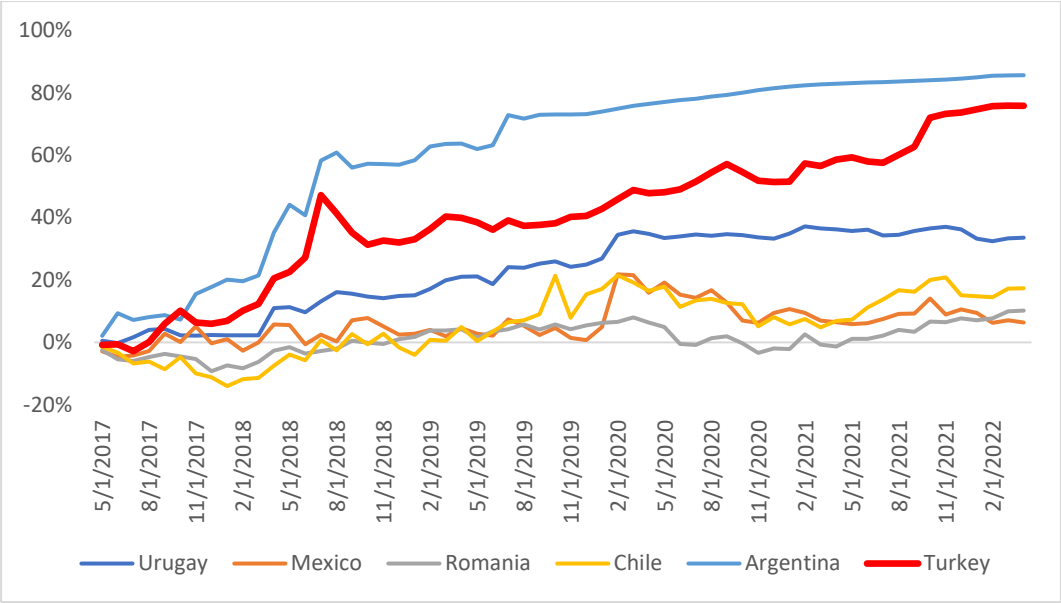


Figure 4.4: Currency Changes of Selected Countries Against U.S Dollar (2017 and 2022)

Source: Data sourced from Yahoo Finance[42]

As seen in figure 4, all countries have experienced fluctuating currency changes against the U.S dollar between 2017 and 2022. Especially starting from the second half of 2018, all the selected countries' currencies have a depreciation trend. Besides the common experience, currency depreciation in Argentina and Turkey is more significant than in other countries. As mentioned in the second chapter, one of the reasons that cause people in developing countries to be interested in cryptocurrencies is the desire to protect their savings. Temporal overlap between google search data and currency changes for selected countries supports the positive relationship between cryptocurrency tendency and macroeconomic instability.

In spite of being a "latecomer" country, the pace of the adoption of cryptocurrencies in Turkey salient. As stated in the first chapter, along with the evolution of cryptocurrencies, their usage area of them expanded, and people started to use various types of cryptocurrency-related tools. The usage area of cryptocurrencies is expanded with the high level of interest in cryptocurrencies since 2021. There was only one

[42] Positive changes indicates the depreciation in the countries' fiat currencies.

bitcoin ATM[43] in Turkey in 2020, and after the peaked interest in cryptocurrencies, the number of them increased to ten in 2021. There are nine bitcoin ATMs in İstanbul and one in İzmir (Köse, 2021). According to a tweet by CoinMarketCap in December 2021, Turkey's share of cryptocurrency users constitutes over 16% of the total users, and that share corresponds to the fourth position among the countries[44]. NFT expansion in Turkey was one of the usages of cryptocurrencies that contributed to their evolution of them in 2021. Tarık Tolunay, who is an art worker, sold his NFT in 2021, which was the first NFT sale in Turkey. After the first sale, various people such as journalists, comedians, and writers started to sell their NFTs. Murat Pak, who is a crypto artist, sold his NFTs for a total of over 1 million U.S dollars. As NFT sales became popular in Turkey, various types of NFT sale projects occurred, such as selling recipes by chefs and collection of a history of football clubs as NFT (Kılınç, 2021).

It is true that the crypto ecosystem is evolving, and novel usage areas related to cryptocurrencies as time passes in Turkey. As mentioned above, NFTs are one of the most popular usage types of cryptocurrencies in Turkey at the time of this research. According to the news, it is estimated that there will be over four million people who are interested in NFTs in Turkey soon[45]. Even though the diversity of cryptocurrency usage is increasing, investing in cryptocurrencies through CEXs dominates their usage type of them. As mentioned in figure 4.2, over half of daily cryptocurrency users in Turkey use the local cryptocurrency exchange called BtcTurk Pro. Since the proportion of daily users in BtcTurk Pro corresponds to the substantial amount of people, the distribution of cryptocurrencies in this exchange could indicate what the most common cryptocurrencies in Turkey are.

[43] Bitcoin ATMs (Automated Teller Machine) are kiosks that allows a person to purchase Bitcoin and other cryptocurrencies by using cash or debit card.

[44] https://twitter.com/CoinMarketCap/status/1473395917642420232

[45] https://www.milliyet.com.tr/ekonomi/4-milyon-turk-nftye-kosuyor-6734216

Table 4.1: Most Traded Cryptocurrencies in Turkey through Using BtcTurk Pro (12th of April 2022)[46]

TRY	USDT	BTC
SHIB/TRY	SHIB/USDT	DOGE/BTC
SPELL/TRY	AMP/USDT	XLM/BTC
ANKR/TRY	DOGE/USDT	TRX/BTC
USDT/TRY	ANKR/USDT	MANA/BTC
AMP/TRY	GALA/USDT	DOT/BTC

Source: BtcTurk Pro

The most used trading pairs for cryptocurrencies in BtcTurk Pro are the Turkish Lira (TRY), Tether (USDT), and Bitcoin (BTC). There are two important inferences related to the table above. The first important inference is the most traded cryptocurrencies are Shiba Inu (SHIB) and Dogecoin (DOGE). Both coins are classified as meme tokens. As mentioned in the second chapter IMF assessed meme tokens as more unreliable and risky cryptocurrencies. The prevalence of meme tokens in Turkey constitutes a high level of risk for users due to the influence of social media on the price of these tokens. The price of meme tokens changes excessively when a famous person tweets a rumor related to their shares on social media. The tendency of people to invest in meme tokens indicates that people in Turkey could have a high-risk appetite for cryptocurrency investments. The second important inference is that the USDT is one of the most traded pairs with the Turkish Lira. As mentioned previously, currency depreciation in Turkey has an increasing trend. Due to the depreciation of the Turkish Lira, people tend to keep their savings in foreign exchanges. Since the price of USDT is mainly backed by the U.S dollar, people who want to keep their savings in foreign exchanges tend to invest in USDT. There are some reasonable motivations to invest in USDT in Turkey. One of the important features of cryptocurrency transactions is being fast. Because of the high volatility in TRY, people want to take advantage of the volatility in TRY and want to trade TRY fast to gain from volatility. CEXs are faster than commercial banks in terms of performing transactions. Furthermore, during the high volatility and out-of-work hour time, commercial banks

[46] https://pro.btcturk.com/

increase the difference between selling and buying rates. On the other hand, CEXs provide more stable selling and buying rate differences (i.e., fees) regardless of the volatility and work hour time. Lastly, in Turkey, exchange tax is implemented with the ratio of %0,2 when people buy foreign exchanges with TRY. On the other hand, cryptocurrency transactions are not subjected to any tax in Turkey at the time of this study.

As mentioned in the second chapter, one of the substantial determinants of the adoption of cryptocurrencies is arising from the regulations related to them. It is beneficial to investigate the regulatory institutions' position related to cryptocurrencies in Turkey to understand the high level of a tendency to cryptocurrencies.

4.3. Legal Framework of Cryptocurrencies in Turkey

As mentioned before, cryptocurrency usage in Turkey started to escalate at the beginning of 2020 and made a significant upsurge at the beginning of 2021[47]. That upsurge brings potential risks to the economy of Turkey. Cryptocurrencies comprise various risks to the countries' economies, primarily related to money laundering events. The risk could have arisen from the cryptocurrencies stated by European Parliament as: "money laundering, terrorist financing, tax evasion, and financial crimes" (European Parliament, 2018). Many countries have taken regulative actions pertaining to cryptocurrencies. In June 2013, Law No.6493 was published in the Official Gazette[48]. The Law was about the general regulations about electronic money and electronic money institutions. That Law is essential for providing legal status to electronic money and can be considered the first step in regulating new types of money.

Banking Regulation and Supervision of Agency (BRSA) made the first official announcement associated with cryptocurrencies in November 2013[49]. In the press

[47] See figure: 4.1

[48] Available at https://www.tcmb.gov.tr/wps/wcm/connect/a1dfa390-023c-464a-a291-d05d9e0c8884/Payment+Systems+Law.pdf?MOD=AJPERES

[49] https://www.bddk.org.tr/Duyuru/EkGetir/510?ekId=530

release, BRSA mentioned the bitcoin as a type of virtual currency and assessed it out of Law No. 6493 due to the lack of any official or private institution behind the bitcoin. BRSA mentioned that the anonymity of virtual currencies creates an environment for illicit activities. Also, BRSA stated that bitcoin is exposed to risks such as high volatility in market value and theft or loss of digital wallets (BRSA 2013). The announcement is important in terms of understanding the view of the regulatory authorities of Turkey. It is understood that the approach of the regulatory authorities is not taking bitcoin and other coins as a form of money. Even though the presence of an announcement by BRSA indicated the importance of bitcoin and other coins in the economy of Turkey, the unacceptance of them as a form of money officially shows the tendency to non-regulating them.

On the 11th of January 2018, the Financial Stability Committee (FSC) published a press release. The press release accentuated that there is no legal basis for cryptocurrencies, and it was decided to establish a working group regarding the improvement of cryptocurrency regulations. Also, users warned about risks that can be occurred attributed to cryptocurrencies. Risks are stated as high volatility in the price, theft of digital wallets, and operational risks for the service providers. It is also expounded that the anonym structure of the cryptocurrencies opens up an opportunity for fraud. It is stated that there is no legal basis for cryptocurrencies, and users should be aware of the downsides of cryptocurrencies by considering such risks (FSC, 2018).

On the 27th of September 2018, the Capital Markets Board of Turkey (CMBT) published a bulletin related to digital assets and initial coin offerings (ICO). The bulletin states that selling procedures of digital assets are out of the scope of surveillance and regulation of CMBT. Users are warned about risks such as volatility in the price of cryptocurrencies, potential misinformation in the documents that digital asset providers provide, and the possibility of the project's failure. It is emphasized that there is no regulation about ICO within the realm of authority of CMBT, and users disregard the selling of crypto assets under the name of ICO (CMBT, 2018, p.4).

In the following years, cryptocurrency adoption was evaluated, and the Grand National Assembly made other official statements about Turkey in July 2019. Within the scope of the 11th Development Plan:

"249.5. Blockchain-based digital central bank money will be implemented."

"250.3. Association of Payment Services and Electronic Money Institutions will be established" (Presidency of Strategy and Budget, 2019, p.47).

It is a significant step for regulatory authorities in Turkey in terms of the consideration of cryptocurrencies. The announcement of the aim of implementing digital money by the Central Bank of the Republic of Turkey shows the importance of evaluating cryptocurrencies for the economy of Turkey. After the initial contemplation of the central bank digital currency, on the 12th of March 2021 Minister of the Treasury and Finance stated that there are serious concerns related to cryptocurrencies, and the roadmap of the central bank digital currency is constituted[50]. Also, in the scope of the Economic Reforms Action Plan, it is stated that Action No: 3.4.d "The Central Bank will establish the economic, technological and legal infrastructure of digital money" (Treasury and Finance Ministry, 2021, P.17). On the 1st of April 2021, a press release was made by the Treasury and Finance Ministry about the fighting against financing terrorism via cryptocurrencies. The announcement mentioned that Financial Crimes Investigation Board (FCIB) could request information from cryptocurrency exchanges within the scope of its duties and responsibilities[51]. While the legal basis of cryptocurrencies in Turkey was working, one of the biggest cryptocurrency exchanges, Thodex, collapsed. Thodex was holding investments of 390,000 users, which is 2 billion U.S dollars[52]. This incident accelerated the legal regulations for cryptocurrencies, and on the 16th of April 2021, Law No: 31456 was published in the Official Gazette. This Law is important in two aspects. Firstly, it propounds on how the legal authorities define cryptocurrencies. Secondly, regulation is about how cryptocurrencies can be used in the economy.

> In the implementation of this regulation, crypto-asset refers to intangible assets that are created virtually using distributed ledger technology or similar technology and distributed via digital networks, but are not classed as fiat money, deposit money, electronic money,

[50] https://www.hmb.gov.tr/duyuru/hazine-ve-maliye-bakani-sayin-lutfi-elvan-anadolu-ajansi-editor-masasinda-ekonomi-reformlarinin-detaylarini-anlatti

[51] https://www.hmb.gov.tr/duyuru/basin-aciklamasi-6

[52] https://www.bbc.com/news/world-europe-56871403

payment instrument, securities, or other capital market instruments (CBRT, 2021, Article 3-1).

"Crypto-assets shall not be used directly or indirectly in payments."

"No services shall be provided that involve the use of crypto assets directly or indirectly in payments."

"Payment and electronic money institutions shall not intermediate the fund transfers from and to the platforms providing services of trading, custody, transfer or issuance related to crypto-assets" (CRBT, 2021, Article 3-2, 3-3, and 4-2).

CBRT sees cryptocurrencies as a type of asset since it is written as "crypto-assets" in Law No:31456. Also, banning the use of cryptocurrencies in the payment system shows how the CBRT assesses the challenges related to cryptocurrencies. It is a clear and emphatic regulation in terms of controlling the money market. Concerns about cryptocurrencies escalated when collapse incidents occurred related to more cryptocurrency exchanges. While the regulations about cryptocurrencies are evolving with the publishment of Law No:31456, at the same time, some cryptocurrency exchanges called Sistemcoin, Vebitcoin, and Goldexco are collapsed[53]. After these fraud incidents, an amendment in the regulation called "Regulation on Measures Regarding Prevention of Laundering Proceeds of Crime and Financing of Terrorism"[54] depending on Law No: 5549[55] published on the 1st of May[56]. According to the amendment, the crypto asset providers are added to the list of obliged parties in the implementation of the Law. After the amendment in the Law, the crypto exchanges and users are needed to accomplish some processes. Users have to make transactions to cryptocurrency exchanges through bank transfers. Also, users are required to provide information related to their identification, like an ID card or passport. Crypto exchanges have to acquiesce to anti-money laundering measures like reporting

[53] https://www.ft.com/content/e5d6513c-f06f-4451-a36b-f0ac622e783d

[54] https://ms.hmb.gov.tr/uploads/sites/2/2019/04/R_RoM-1.pdf

[55] LAW NO: 5549 On Prevention of Laundering Proceeds of Crime available at: https://ms.hmb.gov.tr/uploads/sites/2/2019/04/Law-No_5549-on-Prevention-of-Laundering-Proceeds-of-Crime-2.pdf

[56] https://www.resmigazete.gov.tr/eskiler/2021/05/20210501-5.pdf

doubtful transactions or providing documents when needed. Financial Crimes Investigation Board (TFCIB) is authorized for illicit incidents related to cryptocurrencies. In May 2021, TFCIB announced documentation about the main principles for crypto asset providers. In the documentation, there is information about obligations and example transactions that could be considered suspicious for crypto asset providers (TFCIB, May 2021). One of the critical sanctions is administrative fines when obligations are violated.

Table 4.2: Sanctions for The Violation of The Obligations

Violated Obligation	**The administrative fine for a single violation (Turkish Lira)**	**The upper limit for the administrative fine (Turkish Lira)**
Identification of customers	30.000	4.000.000
Reporting the suspicious transactions	50.000	4.000.000
Reporting periodically	30.000	4.000.000

Source: (Ibid, p.15).

Also, in the documentation, it is stated that since the crypto asset providers are considered the obliged parties in Law No:5549 after the amendment, it could be imposed imprisonment of one to three years and a judicial fine of 5,000 days for parties that divulge information about suspicious transactions unofficial authorities (Ibid, P.15).

Through the diffusion of cryptocurrencies in the economy of Turkey, cryptocurrencies are considered "unimportant" instruments by regulatory authorities. The potential impact of cryptocurrencies on financial stability is not understood because of the regulatory authorities' approach. Regulatory authorities in Turkey were uncommitted about cryptocurrencies until some sizeable illicit activities happened. After the fraud incidents, many regulatory authorities regulated cryptocurrency-related activities in coordination in 2021. As a result, cryptocurrencies are banned from the payment system, and many obligations are legislated related to cryptocurrency providers.

4.4. Why do people put interest in cc in turkey?

As shown in the study, cryptocurrencies are highly volatile assets in terms of price. High volatility in the price of cryptocurrencies constitutes a high risk when people consider them as an investment tool. On the other hand, high volatility brings an opportunity to gain more from the investment. Increasing interest in cryptocurrencies in Turkey may be aroused by the appetite to gain more from an investment. This idea of the study can be underpinned by some rigid conditions associated with the Turkish economy.

The economy of Turkey has exhibited a very fragile state of affairs, especially starting in 2017. The Turkish Lira-U.S Dollar exchange rate was 2.95 in January 2016, and it reached 3.77 in January 2017. During the next five years, depreciation in the Turkish Lira continued, and in October 2020 exchange rate reached 9.5[57]. When bearing in mind that the Google search data for "kripto para" has swelled drastically at the end of 2020, it could be an important motivation behind the cryptocurrency investment in Turkey. Depreciation of the Turkish Lira can be more significant within the thesis framework when compared to other cryptocurrencies in terms of return.

Table 4.3: Returns of Turkish Lira and Selected Cryptocurrencies (April-November 2021)[58]

	Returns								
Cryptocurrency/TL	March 1 (Base Month)	April	May	June	July	August	September	October	November
TL	0%	2%	-3%	-5%	-2%	-1%	-7%	-14%	-15%
BTC	0%	-2%	-37%	-41%	-29%	-20%	-26%	4%	4%
ETH	0%	45%	42%	19%	32%	79%	56%	124%	125%
HOT	0%	-	-	-32%	-30%	17%	-12%	56%	45%
CHZ	0%	-	-50%	-55%	-53%	-36%	-54%	-27%	-21%
AVAX	0%	15%	-37%	-58%	-53%	37%	132%	124%	127%
DOT	0%	-1%	-37%	-56%	-55%	-15%	-23%	15%	35%
SHIB	0%	-	-	0%	-33%	-22%	-22%	644%	700%
USDT	0%	0%	0%	0%	0%	0%	0%	0%	0%
DOGE	0%	529%	507%	374%	288%	419%	281%	422%	406%

Source: Author's calculation[59]

[57] Data available at https://finance.yahoo.com/

[58] Period is selected between March and October 2021 in regard to cryptocurrency interest in Turkey concerning Google search data. Cryptocurrencies are selected based on their volume in BinanceTR in regard to interest by people.

[59] Data is derived from https://finance.yahoo.com/

As seen in the table, the Turkish Lira depreciated except for one month during the selected period. Especially in October and November, depreciation in the Turkish Lira is significant, with rates of -14% and -15% sequentially. On the other hand, even though the returns of the selected cryptocurrencies are highly volatile, their returns are mainly positive. Compared to the Turkish Lira, some cryptocurrencies brought extremely high returns. Such as DOGE and SHIB have returns of 406%, and 700%, whereas the Turkish Lira has a return of -15% in November. As mentioned previously, these meme tokens constitute a high level of risk for users due to the excessive volatility in their prices. On the other hand, taking a high level of risk could indicate that people in Turkey are risk-takers or they are trying to protect their savings against decreasing purchasing power.

The risk preference of people and their behavior related to protecting savings are going to be investigated via conducting a survey-based analysis. The march of inflation in Turkey could give preliminary inference about the protection behavior of people related to decreasing purchasing power.

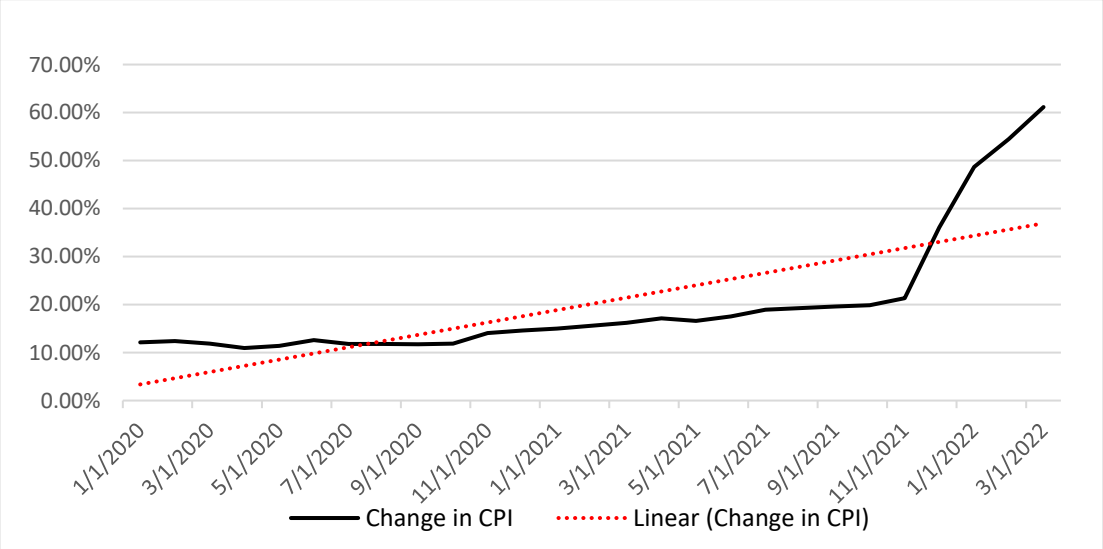


Figure 4.5: Consumer Price Index Annual Rate of Change (%)

Source: Author's Calculation[60]

[60] Data derived from https://data.tuik.gov.tr/

As seen in the figure, the inflation rate has had an increasing trend during the last two years. At the beginning of 2020, CPI was 12%, and in September 2021, it reached 19.6 %. Since the last quarter of 2021, inflation has extremely increased and reached over 60% in March 2022. Considering the increasing interest in cryptocurrencies in Turkey during the last two years, it is plausible that one of the significant reasons is the high CPI. It is likely that people who wanted to compensate for the decrease in their purchasing power tended to invest in cryptocurrencies.

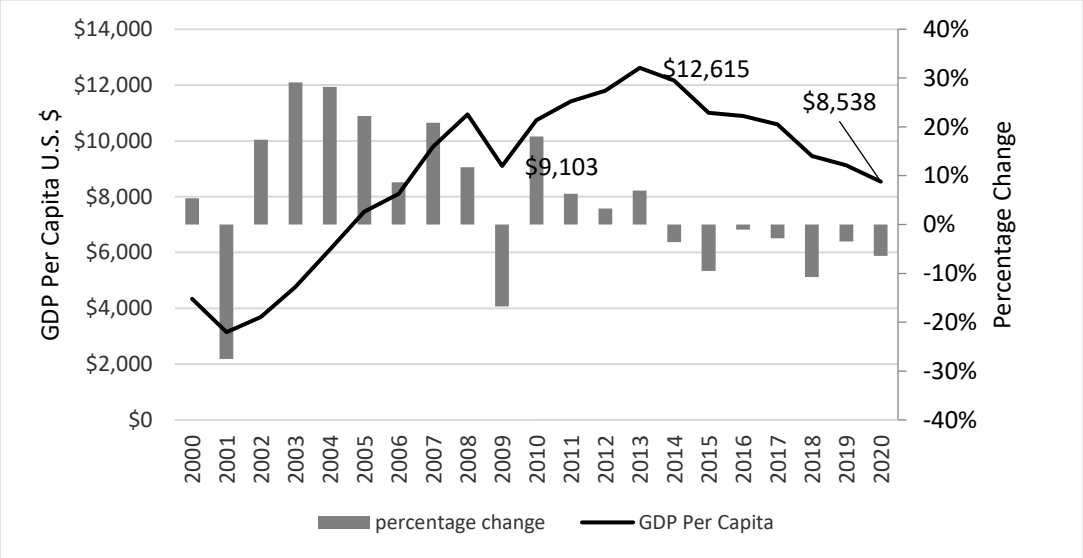


Figure 4.6: GDP Per Capita (Current U.S. $)

Source: Author's calculation[61]

As seen in the figure, GDP per capita reached the maximum level in 2013 with a value of over 12000$ and started to decrease after that. Especially in 2018, GDP per capita has fallen 11% and continued to decline during the last year. In 2020 it was 8.5 thousand U.S. $, which is less than the value in 2009. It indicated that the value of the GDP per capita is less than the value of the global financial crisis. Since GDP per capita shows the prosperity of the households, a decrease in the prosperity could be affected the investment behavior of the household. Depreciation in the Turkish Lira is the main component of the reduction in the GDP per capita. Also, the Covid-19 pandemic has had a significant impact on the decrease in GDP per capita. Depreciation

[61] Data derived from https://data.worldbank.org

in the Turkish Lira may be increased the appetite for gaining from the investment in cryptocurrencies. Also, the reduction in the employment rate due to the Covid-19 pandemic may pave the way for investing in cryptocurrencies for unemployed people.

As evinced by means of stated macro-stability indicators, there is instability in the economy of Turkey. Such an environment sparks off the people to seize a chance to amend the loss of their wealth. Since cryptocurrency investments provide a significant opportunity to gain massive profits, people may perceive cryptocurrency investment as the easiest way to compensate for the negative impact of Turkey's unstable macroeconomic conditions on their wealth.

Even though there is temporal overlap with the macroeconomic instability and high level of cryptocurrency interest during the last two years in Turkey, the relationship is based on only an inference. A survey-based analysis is going to be made to analyze the motivation behind the tendency of people who invest in cryptocurrencies. It is aimed to understand the rationale behind the cryptocurrency investment by applying econometric analysis methods to the data derived from surveys.

4.5. Literature Review

Cryptocurrencies are one of the most interest shown topics by people in recent years. After the invention of bitcoin, people started to put interest in cryptocurrencies, and in 2021 cryptocurrency ecosystem was worth over 2,5 trillion U.S dollars, as mentioned. As cryptocurrency usage expands and more people start to be interested in cryptocurrencies, researchers investigate the reasons for cryptocurrency adoption. Cryptocurrency adoption comprises any type of operation that is related to cryptocurrencies. While some people purchase cryptocurrencies and use them as an investment tool, some people use cryptocurrencies for other purposes like catching up on the current popular things, an alternative method for carrying out services such as insurance, etc. Both qualitative and quantitative methods are used to research cryptocurrency adoption worldwide. Connoly and Kick (2015) investigated the adoption of bitcoin as a payment method or not by organizations using qualitative analysis. They have used the Diffusion of Innovation Theory (DOI) to identify the organizations' characteristics. They analyzed thirty companies according to

characteristics of innovativeness, IT readiness, and social media presence. They have sourced information related to companies from websites and used the data to identify the characteristics of companies. In the study, it is qualitatively found that adopter organizations tend to have a higher level of all characteristics than non-adopters. Authors asserted that the adoption of bitcoin as a payment method by organizations is important for customers' adoption of bitcoin (Connoly and Kick, 2015). At the time of their study cryptocurrency ecosystem was not as evolved as nowadays, and due to the lower level of evolution, their assessment was focused only on the usage of bitcoin as a payment method. Today, there are various types of usage of cryptocurrencies, and using them as a payment method is not among the common way of usage. Khairuddin et al. (2016) investigated the motivation of bitcoin usage by interviewing nine users of bitcoin in Malaysia. In their study, semi-structured interviews are employed to search people's experiences with bitcoin. They have used interviews as a research method because of the implementation of open questions. The authors concluded that there are three main themes related to bitcoin motivation. The themes are identified as "Role in monetary revolution, user's empowerment, and perceived (material) value of bitcoin" According to their findings, one of the motivations behind using bitcoin is its impact on the financial and social system. In the study, it is found that people who adopt bitcoin believe that bitcoin is a monetary revolution and will be the future of money. Bitcoin's features, such as precluding third-party institutions, allowing make transfers faster, and having an anonym structure, are identified as the drivers of motivation under the users' empowerment theme. It is found that participants in the study consider gold and bitcoin in a similar way. Even though bitcoin does not exist in physical form, its similarity to gold in terms of scarcity and the existence of cost to extract makes its value perceived as real and parallel to gold (Khairuddin et al., 2016). Perception of similarity between bitcoin and gold by participants indicates that some people tend to evaluate bitcoin as a tool for preserving its value. This result is substantial when the discussion of bitcoin about carrying out the functions of the money thereinbefore in the thesis. As mentioned in the second chapter, interviewed-based research was conducted using TAM in 2021, which qualitatively concluded that perceived usefulness affects bitcoin adoption positively. Even though there are studies that qualitatively analyze cryptocurrency adoption, researchers used quantitative methods

more for studying cryptocurrency adoption. Craggs, B. and Rashid, A. (2016) made a survey-based analysis to determine the factors behind the adoption of bitcoin in Germany. Authors have concluded that news websites and social disclosures are the substantial determinants of the adoption of bitcoin among users (Craggs, B. and Rashid, A. 2016). Schuh and Shy (2016) did a survey-based analysis to estimate econometric models for understanding the adoption of virtual currencies in the USA. The authors concluded that users used bitcoin and other cryptocurrencies not for investment purposes and to use them as means of payment. According to their findings, younger and non-white people who have lower education adopt cryptocurrencies more than other people (Schuh and Shy, 2016).Gunawan and Novendra (2017) analyzed the adoption of bitcoin in Indonesia using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The authors defined four independent variables and created twelve hypotheses to investigate the adoption of bitcoin. In the study, data is collected by questionnaires that include 49 participants. According to their multivariate regression analysis, six of the twelve hypotheses are accepted. Performance expectancy, social influence, and facilitated condition are found as significant variables that positively affect the adoption of bitcoin (Gunawan & Novendra, 2017). Shahzad et al. (2018) studied the adoption of bitcoin in China using a structured questionnaire that was created using a seven-point Likert scale. The authors used 376 responses to conduct the survey and analyzed data for testing their hypothesis. They have applied Structural Equation Modeling (SEM), and according to the estimate of the regression awareness, perceived trustworthiness, perceived ease of use, and perceived usefulness are positively associated with the use of bitcoin (Shahzad et al., 2018). Bohr and Bashir (2014) studied the adoption of bitcoin in the USA by implementing a survey-based analysis. The authors designed the survey to make both quantitative and qualitative analyses. They have resulted that bitcoin investors tend to accumulate less bitcoin as their age increases. One of the important results of the study is people who use bitcoin for buying illicit goods had more bitcoin than those who do not use bitcoin for buying illicit goods. According to their open-question results, users tend to use bitcoin for its anonymity, freedom, and trust-based system (Bohr & Bashir 2014). As mentioned previously, in 2015, the illicit use of cryptocurrencies, especially through the dark web, was popular in 2013. The result of

the Bohr and Bashir's study about people who had used bitcoin for buying illicit goods had more bitcoin arising from the common usages of bitcoin during the early 2010s. As their study supported, people tended to use bitcoin due to its anonymity during the early 2010s. Due to the limited usage area of cryptocurrencies at that time, people who wanted to buy illicit goods adopted cryptocurrencies more than others did. Karaoğlan et al. (2018) studied the awareness and attitude of cryptocurrency users and the motivation of firms that accept cryptocurrencies in Turkey. The authors used survey-based analysis and used data obtained from 154 participants to assess users' attitudes to make econometric analyses. Also, the authors conducted interviews with ten firms and analyzed their motivation qualitatively. According to their results, the most important impact of cryptocurrency adoption in Turkey arises from internet usage. It is found that cryptocurrency users mostly associate cryptocurrencies with tech firms' shares. Authors qualitatively found that the motivation of firms that accept cryptocurrencies arises from using the advertisement effect of cryptocurrencies and making a contribution to the crypto ecosystem (Karaoğlan et al., 2018). Sezer and Gönüllüoğlu (2022) made an interview-based analysis and used qualitative methods to investigate bank manager's attitudes toward cryptocurrencies. There are six interviews made with bank managers in Bilecik. The authors analyzed data under three themes that are general view, superiorities, and risks. The authors concluded that due to the high level of risks and fraud incidents, bank managers evaluate cryptocurrencies negatively. One of the findings of the study is; bank managers think that cryptocurrencies could be the future of money in Turkey when legal infrastructures are provided (Gönüllüoğlu and Sezer, 2022). Fettahoğlu and Sayan (2021) investigated the attitudes of cryptocurrency users in Turkey with a survey-based analysis using TAM. The authors collected data from 320 participants and tested concluded that users in Turkey use cryptocurrencies to not rely on authorities and dislike traditional finance. The authors concluded that perceived risk does not affect the adoption, and perceived benefit positively affects the attitude of users (Fettahoğlu and Sayan 2021). Temizkan et al. (2021) studied the users' behavior who use cryptocurrencies as means of payment. The authors made interview-based analyses and used qualitative methods to investigate the users' behavior. Authors find that social systems affect the adoption process, and disclosures of famous investors positively affect the tendency to the

adoption of cryptocurrencies. According to the study, low transaction fees, high speed, and security positively affect the experience of users. The authors concluded that there is a desire for regulations about cryptocurrencies by legal authorities (Temizkan et al., (2021). In addition to academic studies adoption of cryptocurrencies in Turkey has been investigated by research groups. NG Research Group investigated the adoption of bitcoin in turkey through survey-based analysis. They have collected data from 2,156 participants to conduct the study in March 2022. According to their study, four out of ten people in Turkey invested in bitcoin, but their knowledge about bitcoin is limited. They concluded that 33% of the bitcoin investors assessed the bitcoin investment as unreliable, and while 26% of people think that cryptocurrency revenues need to be objected to tax, %40 of people think the opposite way. Also, they have concluded that there is as asymmetric information about the legal status of bitcoin (Piyasa Anketinden çıkan sonuç, 2022). Another study related to cryptocurrency adoption in Turkey was made by a cryptocurrency analysis platform named Coingecko in 2021. They studied the tendency of cryptocurrency in Turkey with a survey-based analysis and collected data from 715 participants. They have concluded that men that have university degrees constitute the majority of investors. According to their findings, Ethereum, bitcoin, and tether are the most popular cryptocurrencies used in Turkey. They found that cryptocurrency investors in Turkey have limited information about cryptocurrencies. Also, 68% of them use cryptocurrencies for investment, and only 3% of people use them as a protection tool against inflation. According to their study, 91% of people use exchanges for cryptocurrency investment, and Binance is the most popular exchange among people. They have concluded that people have limited information about cryptocurrencies and social media has a substantial effect on their attitude (Coingecko, 2021).

It is understood that at the early stages of the crypto ecosystem, interview-based analyses were more common due to the lack of a high number of cryptocurrency users. As the crypto ecosystem evolved, the number of users increased, and survey-based analyses became widespread. There are studies that use surveys and interviews as a method for analyzing the adoption of cryptocurrencies. Even though there are studies that are related to the adoption of cryptocurrencies in Turkey, the number of them is limited. This study contributes to the literature by analyzing cryptocurrency adoption

in Turkey. Since the studies are limited, this study is one of the earliest studies related to cryptocurrency adoption in Turkey. One of the main contributions of the study is investigating the relationship between the financial situation and the adoption of cryptocurrencies. Furthermore, as mentioned previously, understanding the potentially detrimental effects of cryptocurrencies on the economy has more priority than the potential benefits in this study. Another contribution of the study is investigating the viewpoints of users related to risks arising from cryptocurrency usage. Furthermore, as mentioned previously, as the crypto ecosystem evolved, different types of cryptocurrencies were created, and their usage area of them expanded. One of the contributions of this study is investigating the different usage areas, such as using NFTs and participating in ICO.

4.6. Research Design

The main objective of the study is to determine the factors underlying cryptocurrency adoption in Turkey. As mentioned in the literature review part, there are studies that are related the cryptocurrency adoption in Turkey as newspaper news, reports, and a limited number of academic research. In Turkey, topics like internet usage, disclosures of famous investors, and the purpose of the use of cryptocurrencies are investigated in separate studies, and there are few studies that have investigated the relationship between Turkey's macroeconomic situation and cryptocurrency usage among the people. However, there are not any published articles in international journals related to this topic at the time of this preliminary study. At the time of this study, academic studies that are related to cryptocurrency investment in Turkey are not comprehensive due to the reasons mentioned above. This study aims to contribute to the cryptocurrency literature by analyzing cryptocurrency adoption in Turkey comprehensively. Both survey-based and interview-based analyses are made to make a comprehensive study and contribute to the relevant literature. Survey and interview questions were prepared based on academic analyses of cryptocurrency adoption worldwide. But also taking into consideration peculiar to academic studies that provide guidance for creating survey questions and the lack of topic in the literature related to cryptocurrency adoption considered. In the literature, few studies analyzed

cryptocurrency investment by conducting both interview-based and survey-based analyses.

Furthermore, most studies have investigated the people who have invested in cryptocurrencies. Firstly, there is an increasing tendency to use cryptocurrencies, and researchers focused more to understand the behavior of users than non-users. Secondly, cryptocurrencies are used for numerous purposes, there are more opportunities to investigate the behavior of users, and lastly, cryptocurrency use could potentially affect the policy of regulatory institutions such as central banks. One of the contributions of this study is analyzing cryptocurrency investment via making both interview-based and survey-based analyses. Interview-based questions are used to build upon and strengthen the survey questions to investigate cryptocurrency adoption in Turkey comprehensively. Also, this study goes further by analyzing different groups of people. Survey questions are designed to consist of several parts for analyzing people who actively use cryptocurrencies, who used and are not using cryptocurrencies now, and those who never used cryptocurrencies. One another contribution of the study is providing data about cryptocurrency usage in a developing country and making a comparison with other countries.

4.7. Survey Design

According to Turner (2010), it is important to indicate the aim of the interview, clarify its format of it, and express the duration of it before the implementation of the interview for qualitative investigation. Also, the variety between candidates and their will of openness improves the information of the study. Another parameter is the environment, and it should be comfortable for participants to share information. For an effective interview, questions should be open-ended, fair-minded, constructed as easily understood, and asked one time. During the implementation of the interviews, it is important to remain neutral, encourage the participants with the approval phrases, and afford transition between questions (Turner, 2010).

To be able to conduct an in-depth analysis, standardized open-ended interviews are made with five people to create the survey questions. Interviewees are selected with the consideration of the power of exemplars of the cryptocurrency users in Turkey to

obtain more reliable information to construct robust survey questions. These five interviewees are purposely selected as different from each other in terms of age, monthly salary, education level, etc., to increase the power of survey questions. Open-ended questions are designed to be as easily understandable and conducted in a comfortable environment as Tuner suggested. It is aimed to robust the survey questions via the help of the responses of these five interviewees, and according to the feedback of the interviewees, survey questions are specified.

According to Fink, it is important to determine the main purpose and specific objectives of the survey to collect aimed information related to the research. It is essential to define all terms clearly and avoid ambiguity for people to understand questions easily. Also, questions must be prepared considering the reading comprehension skill of the people. The number of questions needs to be determined, taking into account the amount of time. Standardization of the questions and surveyor is critical to collecting reliable information. For standardization, scales can be used, and the surveyor asks questions without any difference every time. Closed-ended questions provide more standardized data compared to open-ended questions, and data from closed-ended questions can be used for statistical analyses. Using time periods can contribute to creating better survey questions for focusing on a certain time and improving the analyses. For closed-ended questions, determining the response choices is crucial for creating a better survey. Ordinal, numerical, and categorical (nominal) forms of response choices need to be selected considering the purpose of the study. For ordinal response choice, scales can be used, and 5-to-7-point rating scales are sufficient for most of the studies. It is critical to create a meaningful scale to compare the people's responses. Questions need to be created considering the "sensitivity," and scales need to be created so as not to overlap each other. The adoption of questions from published studies could be beneficial since they have already been examined. Also, survey questions need to be examined by experts in terms of complexity and consistency. Also, when translation is needed to conduct the survey, questions must be translated into the respondent's language as being meaningful to them (Fink, 2003).

Quantitative and qualitative studies related to cryptocurrencies have been done in advanced and developing countries, as mentioned in the literature review. Even though

some studies have directly interviewed the people and made qualitative analyses related to the adoption of cryptocurrencies, most studies have done quantitative analysis by collecting data via surveys. In addition to that, there are some studies that have used mix-methods to analyze the adoption of cryptocurrencies. Some studies have focused on the organizations that accept cryptocurrencies as a payment method, which investigated the adoption of bitcoin via interviewing with people and which have done survey-based analysis and made econometric analyses using Structural Equation Models (SEM) like TAM and UTAUT. In the literature, surveys are mainly focused on the use of and adoption of bitcoin due to its pioneer position. In this study, the adoption of cryptocurrencies was investigated in general, not focusing on bitcoin. Also, there is a lack of study in Turkey that underlies the significant factors which determine the adoption of cryptocurrencies. Survey questions are designed to contribute to such shortcomings in the literature.

Questions in the questionnaire for this study are designed with the inspiration of past published studies by Nadeem et al. (2021), Wood et al. (2017), and Karaoğlan et al. (2018), and suitable amendments are made for this research. Suitable amendments are made by collecting information from interviews and certain questions are designed specifically to investigate the current economic structure of Turkey. The questionnaire in the study consists of 4 sections. In the first section, some questions are created to collect demographic information. In the other three sections, there are questions to collect data from a group of people who have used and continue to use cryptocurrencies, who used bot stopped use, and who have never used. Questions in these sections are measured using a 5-point Likert-type scale, as one equals strongly disagree to five equals strongly agree. Likert-type questions in these sections are grouped as follows: the intention to use cryptocurrencies, perceived ease of use, relative advantage, country-specific issues, perceived risk of cryptocurrencies, perception of cryptocurrencies, and image. The questionnaire and interviews are designed considering the academic resources that guide constructing surveys, past studies that used surveys for investigating the adoption of cryptocurrencies, and the evolution of cryptocurrencies in Turkey. Also, the questionnaire is evaluated by professors and the Human Subjects Ethics Committee of METU for appropriateness.

Awareness of cryptocurrencies, perception of them in terms of money or asset, and future expectations about the crypto ecosystem in Turkey are among the primary considerations. Also, this study aims to underly factors beneath the adoption of cryptocurrencies related to the macroeconomic situation in Turkey and individual preferences. Four questions are created under the section of country-specific part of the survey questions to underline macroeconomic reasons for cryptocurrency adoption in Turkey. In the other parts of the survey, questions are designed to research more about the individual perception of cryptocurrencies. The questionnaire was initially developed in English and later translated into Turkish for an easier understanding of Turkish people.

4.8. Research Model, Methodology, and Hypotheses

This study attempts to underline the factors that affect the adoption of cryptocurrencies by examining macroeconomic and sociological components. This study aims to investigate the factors that affect the behavior of people to adopt or not use cryptocurrencies in Turkey. As mentioned, surveys asked three different groups of people to examine the adoption of cryptocurrencies in Turkey. This study focuses on collecting data from people who used and continued and those who used and stopped using cryptocurrencies. As indicated before, most of the studies use TAM and UTAUT to analyze cryptocurrency adoption. The reason for using technology acceptance models to investigate cryptocurrency adoption root in the relationship between humans and technology in a psychological aspect. TAM is used to research the user's response to new technology as rejection or acceptance with considering the individual's psychological characteristics (Wood & Lensky, 2017). The core research model is TAM for this study to make comparisons with other studies. Questions are created based on TAM, and the hypotheses of the model are examined using data from surveys and structural equation modeling (SEM). SEM is used to analyze the data collected from people who used and continued and people who used and stopped to use cryptocurrencies. On the other hand, descriptive statistics are used for underlying the reasons why people have never used or stopped to use cryptocurrencies in Turkey.

Cryptocurrency adoption is investigated mostly with theoretical models that were developed to understand the relationship between humans and technology (Wood et

al. 2017). TAM was established by Davis (1989) to determine how a new technology diffuses and is used in much academic research to investigate the tendencies beneath the adoption of new technology (Shahzad et al., 2018). TAM asserts that attitude determines the behavioral intention of people which consists of two components that are perceived ease of use and perceived usefulness. After the development of TAM, many studies have validated the TAM's propositions empirically (Roca et al., 2006). As mentioned in the literature review part many studies have been used to investigate the adoption of cryptocurrencies. As mentioned above SEM is the core research model in this study and TAM constitutes the baseline for the research model with the addition of new factors such as country-specific issues, perceived risk, perception of cryptocurrencies, and image of cryptocurrencies.

Perceived Ease of Use

Perceived ease of use indicates the level of confidence of people to use a new system with less effort (Davis, 1989). Fröhlich et al., 2020 assert that cryptocurrencies' complex structure constitutes an obstacle to entering the crypto ecosystem for people with less knowledge about them. For more engagement with cryptocurrencies, the level of obstacles is required to be low (Fröhlich et al., 2020).

In the context of this study, perceived ease of use is considered an essential variable to use for people's intention to use cryptocurrencies, and one of the hypotheses is:

Hypothesis 1 (H_1): The perceived ease of use has a positive relationship with the intention to use cryptocurrencies.

Perceived Usefulness

Davis identified the perceived usefulness as a belief of people that using a new system provides benefits to them and could increase their performance of using it (Davis, 1989). In academic studies, it is shown that perceived usefulness has a positive impact on the intention to use technology (V. Venkatesh et al., 2003, N.A.S. Almuraqab, 2017, and D.A. Adams et.al, 1992, as cited in Shahzad et al., 2018).

Cryptocurrency usage is also affected by perceived usefulness, and one of the hypotheses is:

Hypothesis 2 (H_2): Perceived usefulness has a positive relationship with intention with the intention to use cryptocurrencies.

Perceived Risk

Featherman and Pavlou (2003) indicated that perceived risk is commonly defined as the thought of uncertainty related to a negative result of using a service or product. In general, perceived risk is measured with likert type scale as the perception of detrimental effects by people that can occur when a service is used. They have defined the facets of risks as, performance risk, financial risk, time risk, psychological risk, social risk, privacy risk, and overall risk. They asserted that perceived risk is an essential variable for technology acceptance models because people assess the level of risk when they adopt a service or product (Featherman and Pavlou, 2003).

In this study, perceived risk is the financial risk of adopting cryptocurrencies, and questions are created to measure the level of financial risk. If a user perceives cryptocurrencies as a risky product, it is more likely to not be used, and if it is perceived as a less risky product, it is more likely to be adopted. Thus, one of the hypotheses is:

Hypothesis 3 (H_3): Perceived risk has a negative relationship with the intention to use cryptocurrencies.

As mentioned above, country-specific issues, the image of cryptocurrencies, and the perception of cryptocurrencies are used as constructs for examining the factors underlying the adoption of cryptocurrencies by using TAM as a theoretical base. High levels of inflation, high volatility in the Turkish Lira, and the opinion of cryptocurrency influencers are the main consideration of the country-specific issues. The future of cryptocurrencies is the main consideration of the perception of cryptocurrencies variable. Questions for this variable were created to measure the perception of the impacts of using cryptocurrencies. For the image variable, questions

are created to measure the image of cryptocurrency users among the community or their peers. Therefore, other hypotheses of the models are:

Hypothesis 4 (H_4): Country-specific issues have a positive relationship with the intention to use cryptocurrencies.

Hypothesis 5 (H_5): Perception of cryptocurrencies has a positive relationship with the intention to use cryptocurrencies.

Hypothesis 6 (H_6): The image of cryptocurrencies has a positive relationship with the intention to use cryptocurrencies.

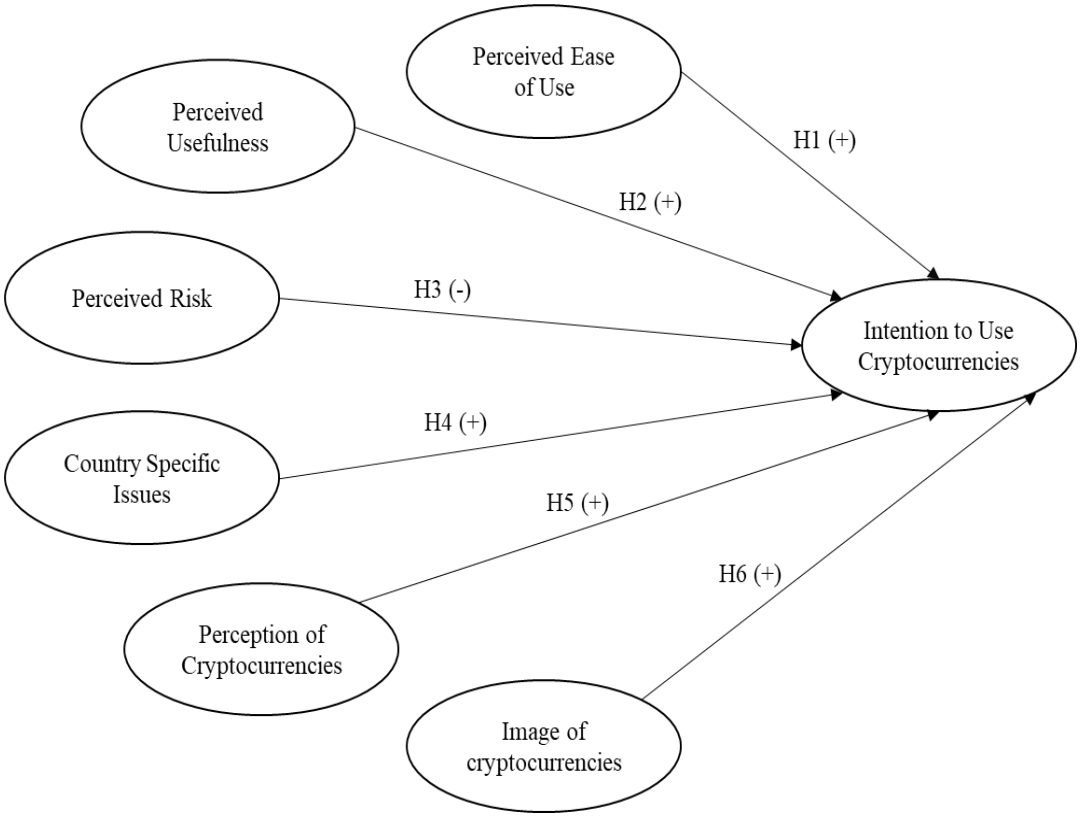


Figure 4.7: Research Model and Hypothesis

Figure 4.7 illustrates the six hypotheses relating to the research model. The model was created to investigate the factors that affect cryptocurrency adoption. The model was tested via SEM using the survey data from only users who have experienced cryptocurrencies. Data from users who have used and stopped to use cryptocurrencies

and who have never used cryptocurrencies are not examined via SEM. This data was investigated with descriptive statistics and attempted to explain why some people stopped using it or why some people have never used it.

4.9. Sample

Participants are selected from different environments for diversification, such as public places, universities, and institutions used for data collection. Data collection resulted in 130 people in total. Seventy-seven people have used cryptocurrencies in the sample; while 43 of them stopped using cryptocurrencies, 34 of them continue to use them at the time of this study. Fifty-three people have never used cryptocurrencies among the participants.

4.10. Data Analysis and Results of the Model

Table 4.4: Demographic Information of the All Participants

Category	Frequency	Percentage (%)
Gender		
Female	46	35.4
Male	84	64.6
Age (years)		
18-24	47	36.2
25-30	37	28.5
31-40	19	14.6
Over 40 years	27	20.8
Education		
High school	43	33.1
College	13	10.0
Bachelor’s degree	65	50.0
Master’s degree	6	4.6
Doctoral degree	3	2.3

As seen in table 4.4, 46 participants were female, which corresponds to 35,4% of the total, and 84 were male, which reaches 64,6% of the total. 36,2% of the participants are among the 18-24 years, 28,5% are among the 25-30 years, 14,6% are among the 31-40 years, and 20,8% are among the over 40 years category. 33,1% of the

participants have a high school degree, 10% have a college degree, 50% of them have a bachelor's degree, 4,6% have a master's degree, and 2,3% have a doctoral degree. As seen in table 4.4, young males with bachelor's degrees constitute the majority of the participants.

As mentioned earlier, modified SEM is created to analyze the data collected from the participants who have used and continued to use cryptocurrencies and who used and stooped using cryptocurrencies. Seventy-seven of the total participants are among these two groups of people. The demographic information and underlying descriptive statistics related to these groups can be seen in the tables below.

Table 4.5: Demographic Information of Cryptocurrency Experienced Participants

Category	Frequency	Percentage (%)
Gender		
Female	20	26
Male	57	74
Age (years)		
18-24	28	36.4
25-30	22	28.6
31-40	12	15.6
Over 40 years	15	19.5
Education		
High school	28	36.4
College	8	10.4
Bachelor's degree	35	45.5
Master's degree	3	3.9
Doctoral degree	3	3.9

As seen in table 4.5, 74% of the cryptocurrency users in the sample are male and 26% of them are female. 36,4% of the participants are among the 18-24 years, 28,6% are among the 25-30 years, 15,6% are among the 31-40 years, and 19,5% are among the over 40 years category. 36,4% of the participants have a high school degree, 10,4% have a college degree, 45,5% have a bachelor's degree 3.9% have a master's degree and 3,9% have a doctoral degree.

In a study that investigates the adoption of cryptocurrencies in the USA, it is found that younger people with lower education tend to adopt more than others (Schuh and Shy, 2016). As stated above, younger people in the participants of this study tend to adopt cryptocurrencies more than others, similar to the findings of Schuh and Shy. Still, in terms of education, this study's results differ from those of Schuh and Shy.

Table 4.6: Frequency Distribution of Answers to Selected Questions of Cryptocurrency Users

Category	Frequency	Percentage (%)
Income Level		
Below 1000 TL	3	3.9
1001-5000 TL	29	37.7
5001-1000 TL	8	10.4
Over 10000 TL	37	48.1
Source of Knowledge		
Social media	12	15.6
Friends	64	83.1
Web pages	1	1.3
Knowledge Level		
I have heard about cryptocurrencies, but I do not know what they are	8	10.4
I have some knowledge of cryptocurrencies	54	70.1
I know about cryptocurrencies	14	18.2
I know a lot about cryptocurrencies	1	1.3
CeFi and/or DeFi		
CeFi	67	87
DeFi	10	13
Using Time		
Below 1 year	22	28.6
1 to 3 years	55	71.4
Using Activity		
Actively using	34	44.2

Table 4.6 (continued)

Stopped to use	43	55.8
Most Used Time		
2016	1	1.3
2020	4	5.2
2021	69	89.6
2022	3	3.9
Invested Cryptocurrencies		
BTC	48	24.4
ETH	20	10.2
USDT	17	8.6
BNB	11	5.6
SHIB	44	22.3
DOGE	47	23.8
Other altcoins	10	5.1
Other Investment Choices		
None	9	11.7
FX/Gold	56	72.7
Real estate/land	1	1.3
Cars	3	3.9
Shares	8	10.4
The Most Profited Value		
Below 1000 TL	25	32.5
1001-5000 TL	24	31.2
5001-1000 TL	13	16.9
Over 10000 TL	15	19.5
The Most Loss Value		
Below 1000 TL	22	28.6
1001-5000 TL	33	42.9
5001-1000 TL	14	18.2
Over 10000 TL	8	10.4
Profit Loss Statement		
Profit	35	45.5
Loss	35	45.5
Balanced	7	9.1

Table 4.6 (continued)

Famous influencers' opinions affect my decision related to cryptocurrencies		
Strongly Disagree	14	18.2
Disagree	9	11.7
Do not Know	14	18.2
Agree	28	36.4
Strongly Agree	12	15.6
The high level of inflation in Turkey increases my cryptocurrency use		
Strongly Disagree	2	2.6
Do not Know	5	6.5
Agree	24	31.2
Strongly Agree	46	59.7
The absence of tax implementation increases my cryptocurrency use		
Strongly Disagree	9	11.7
Disagree	9	11.7
Do not Know	24	31.2
Agree	16	20.8
Strongly Agree	19	24.7
Volatility in the fx rate increases my cryptocurrency use		
Strongly Disagree	1	1.3
Do not Know	6	7.8
Agree	24	31.2
Strongly Agree	46	59.7

As seen in table 4.6, cryptocurrency users with relatively higher income tend to invest in cryptocurrencies more than those with less income. 83,1% of the participants heard about cryptocurrency from their friends and 15,6% of them heard about cryptocurrency from cryptocurrencies from social media, and only 1,3% of them heard about cryptocurrencies from web pages. 70,1% of the users indicated that their knowledge level about cryptocurrencies is neither too good nor too bad, 18,2% of the users noted their knowledge about cryptocurrencies as good, 10,4% of the users

indicated that they heard about cryptocurrencies, but they do not know what they are, and only 1,3 of them indicated that they have a high level of knowledge about cryptocurrencies. 87% of cryptocurrency users use cryptocurrency exchanges for cryptocurrency investment, and only 13% of them have used DeFi for cryptocurrency investment. 71,4% of the users experienced cryptocurrency investment within the last three years, and 28,6% of the users experienced cryptocurrency investment within the last year. 55,8% of the users have stopped investing in cryptocurrencies, and 44,2% of them continued to invest in cryptocurrencies. 89,6% of the participants indicated that they have invested in cryptocurrencies mainly in the year 2021. Bitcoin (BTC) was the most commonly invested cryptocurrency among the participants that have invested in cryptocurrencies. 24,4% of the users have used BTC, 23,8% of the users have used DOGE, 22,3% of the users have used SHIB, and 10,2% of the users have used ETH. Other altcoins (differently than the options) used by cryptocurrency investors constitute 5,1% of the cryptocurrency types. Choice of FX/GOLD is the most common investment option among the cryptocurrency users in the sample, and 72,7% of the cryptocurrency users in the sample indicated that they had chosen FX/gold as an investment option. %11,7 indicated that they do not use other investment options, 10,4% of them indicated that they had chosen shares as an investment option, 3,9% of them indicated that they had chosen cars as an investment option, and 1,3% of them indicated that they had chosen real estate/land as an investment option. Most cryptocurrency users are among the participants who lose and gain up to 5000 TL via investing in cryptocurrencies. %32,5 of users profited below 1000 TL, %31,2 of users profited 1001-5000 TL, %16,9 of users profited 5001-10000 TL, and %19,5 of users profited over 10000 TL. %28,6 of users lost below 1000 TL, %42,9 of users lost 1001-5000 TL, %18,2 of users lost 5001-10000 TL, and %10,4 of users lost over 10000 TL. 45,5% of the users indicated their overall position of cryptocurrency investment as profited and 45,5% of them indicated their overall position of cryptocurrency investment as a loss, and 9,1 % of them indicated that they have not either profited or lost from cryptocurrency investment. Four questions are asked to understand country-specific conditions that could affect cryptocurrency adoption in Turkey. Majority of the cryptocurrency users agree or strongly agree that the opinions of cryptocurrency influencers as a reason for their cryptocurrency use. While 52% of them strongly agree

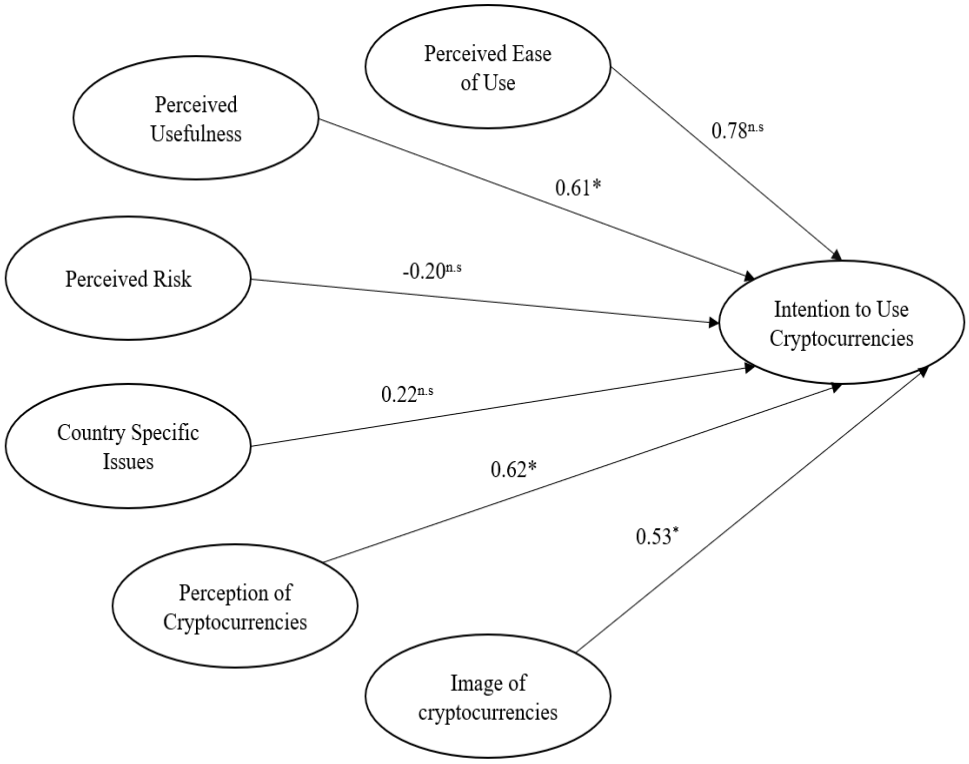
and agree that famous influencers' opinions affect their cryptocurrency use, 29,9% of the participants strongly disagree and disagree with that idea. 59,7% of users strongly agree, and 31,2% of them agree that the high level of inflation in Turkey increases their cryptocurrency use. 24,7% of the users strongly agree that the absence of tax implementation on cryptocurrency investment in Turkey increases their cryptocurrency use, and 20,8 of them agree with that idea. On the other hand, 31,2% of the users were indecisive about this idea. 59,7% of them strongly agree, and 31,2% of them agree that volatility in the foreign exchange rate increases their cryptocurrency use.

The choice of BTC, DOGE, and SHIB is salient for the cryptocurrency users among the participants. As mentioned previously bitcoin is the most popular cryptocurrency worldwide, and not surprisingly, the choice of bitcoin for users in this study constitutes the most. As stated previously in this chapter, SHIB and DOGE were the most invested cryptocurrencies in one of the biggest cryptocurrency exchanges in Turkey. The high proportion of these meme coins among the sample support this data. USDT usage could be rooted in different reasons. As mentioned in the second chapter USDT is one of the stablecoins that tried to stabilize its value, and the tendency to invest in USDT could be welded to high volatility in the TL. One another reason is the higher tendency to invest in FX among the participants. As stated above, 69,2% of the users tend to invest in FX. Since USTD tries to stabilize its value by pegging it to U.S dollars, its value moves smiler to U.S dollars, and this situation makes the USDT considered as an FX investment option. Similar to other studies like the adoption of bitcoin in Malaysia (Khairuddin et al., 2016), participants in this study considered cryptocurrencies and FX/gold similarly, as indicated that 69.2% of the participants chose FX/gold as the other investment option. Craggs, B. and Rashid, A. (2016) have found that news websites and social disclosures are the substantial determinants of the adoption of bitcoin among users in Germany (Craggs, B. and Rashid, A. 2016). In this study, different from the study of Craggs, B. and Rashid, A, 80.8% of the users among the participants have heard about cryptocurrencies from their friends rather than websites or social media as in the other studies.

Table 4.7: Construct Reliability Statistics

Variables	$\chi 2$	df	$\chi 2$/df	CFI	TLI	RMSEA
Perceived Ease of Use	178.381	76	2.347	0.555	0.386	0.133
Perceived Usefulness	295.496	134	2.205	0.602	0.492	0.126
Perceived Risk	164.749	89	1.851	0.652	0.531	0.106
Country Specific Issues	145.270	76	1.911	0.619	0.474	0.110
Perception of Cryptocurrencies	260.716	103	2.531	0.496	0.334	0.142
Image of Cryptocurrencies	154.952	76	2.039	0.767	0.679	0.117

The reliability of the constructs in the modified model was tested using SEM. The results related to the reliability of the constructs are shown in the table above. The chi-square value divided by the degree of freedom is one of the indices that reflect the model fit. If the value of $\chi 2$/df is less than or equal to 3, that corresponds to an acceptable fit, and if the value of $\chi 2$/df is less than or equal to 3, that corresponds acceptable fit. CFI is one of the criteria that evaluated the model fit, and its value changes between 0 and 1. If the value of CFI is equal to or greater than 0.95 it corresponds to a good model fit (Kline, 2005; Hu & Bentler, 1998). According to Schumacker and Lomax (2015), if the value of RMSEA is within 0.05 and 0.08 it indicates a close fit and if the value of TLI is close to 0.9 it indicates a good model fit (Schumacker & Lomax, 2015). As seen in table 4.7, the $\chi 2$/df value for every 6 constructs is less than 3, indicating that models are reliable when the $\chi 2$/df criterion is considered. In this study, the sample size for the SEM analysis is 77, and model fit indices like TLI, CFI, and RMSEA evaluate better when a larger sample size. Due to the low sample size, the $\chi 2$/df criterion is considered in assessing the model fit.



*Estimate is significant at 0.05 level; n.s = not significant

Figure 4.8: Results of the Hypothesis of the Research Model

The structural model was tested via SEM, and the results of the SEM are depicted in figure 4.8 Three of the six constructs entered into the model had a statistically significant effect on the intention to use cryptocurrencies. Perceived usefulness had a significant positive impact on intention to use cryptocurrencies with $\beta=0.61$; $p<0.05$, supporting H_2. This result implies that as perceived usefulness increases, the intention to use cryptocurrencies increases substantially. Perception of cryptocurrencies had a significant positive effect on the intention to use cryptocurrencies with $\beta=0.62$; $p<0.05$; supporting H_5. This result implies that as the perception of cryptocurrencies increases, the intention to use cryptocurrencies increases considerably. The last significant construct in the model is the image of cryptocurrencies. The image of cryptocurrencies had a significant positive effect on the intention to use cryptocurrencies with $\beta=0.53$; $p<0.05$. This result supports the H_6, and as the image of cryptocurrencies increases, the intention to use cryptocurrencies increases. The other three constructs, perceived ease of use, perceived risk, and country-specific issues, did not statistically significantly affect the intention to use cryptocurrencies.

As stated before, most of the studies that have been researched using SEM have focused on bitcoin. When the result of the SEM analysis was compared to other studies that have researched the intention to use bitcoin; similar to other studies, the adoption of bitcoin in China (Nadeem et al., 2021) and adoption of bitcoin in China (Shahzad et al., 2018), it is found that the effect of perceived usefulness on intention to use cryptocurrencies significantly positive. Since China is a developing country, the results of the SEM in this study support the idea that perceived ease of use and perceived usefulness are among the substantial determinants of intention to use cryptocurrencies in developing countries. One of the statistically significant constructs is the perception of cryptocurrencies, and six questions and/or statements are created to investigate this construct. Among these six questions, two of them: "more people use cryptocurrencies in the future" (β=0.571; $p<0.05$) and "cryptocurrencies are big innovation" (β=0.829; $p<0.05$), have a significant impact on the intention to use cryptocurrencies. Similar to the result of the study that investigates the adoption of bitcoin in Malaysia (Khairuddin et al., 2016), people who adopt cryptocurrencies think that cryptocurrencies will be the future of money, and it is a substantial innovation.

As stated before, participants are investigated under three categories as people who use cryptocurrencies and actively using, those who used and stopped to use cryptocurrencies, and people who have never used cryptocurrencies. Demographic and descriptive statistics related to people who used and stopped to use cryptocurrencies can be seen in the tables below.

Table 4.8: Demographic Information of Users Who Stopped Using Cryptocurrencies

Category	Frequency	Percentage (%)
Gender		
Female	13	30.2
Male	30	69.8
Age (years)		
18-24	18	41.9
25-30	14	32.6
31-40	5	11.6
Over 40 years	6	14.0

Table 4.8 (continued)

Education		
High school	19	44.2
College	4	9.3
Bachelor's degree	19	44.2
Doctoral degree	1	2.3

As seen in table 4.8, most of the users who stopped using cryptocurrencies are younger males with high school and bachelor's degrees, and demographic information is similar to the total number of cryptocurrency users.

Table 4.9: Frequency Distribution of the Answers Related to Reasons Stop to Use Cryptocurrencies

Category	Frequency	Percentage (%)
Stopped use due to volatility		
Disagree	2	2.3
Do not Know	5	11.6
Agree	22	51.2
Strongly Agree	15	34.9
Stopped use due to its decentralized structure		
Strongly Disagree	6	14.0
Disagree	4	9.3
Do not Know	25	58.1
Agree	6	14.0
Strongly Agree	2	4.7
Stopped to use due to lack of regulations		
Strongly Disagree	4	9.3
Disagree	4	9.3
Do not Know	9	20.9
Agree	21	48.8
Strongly Agree	5	11.6

Table 4.9 (continued)

Stopped use due to hack incidents		
Strongly Disagree	3	7.0
Disagree	5	11.6
Do not Know	11	25.6
Agree	17	39.5
Strongly Agree	7	16.3
Stopped use due to application failures		
Strongly Disagree	11	25.6
Disagree	10	23.3
Do not Know	15	34.9
Agree	5	11.6
Strongly Agree	2	4.7
Stopped use due to money loss		
Strongly Disagree	2	4.7
Disagree	6	14.0
Do not Know	3	7.0
Agree	13	30.2
Strongly Agree	19	44.2
Stopped use due to less profit than other options		
Strongly Disagree	8	18.6
Disagree	15	34.9
Do not Know	9	20.9
Agree	5	11.6
Strongly Agree	6	14.0
What option do you invest in after stop use cryptocurrencies		
FX/Gold	39	90.7
Property/land	1	2.3
Cars	2	4.7
Shares	1	2.3

Table 4.10: Descriptive Statistics of the Answers Related to Reasons for Stop Use of Cryptocurrencies

	stop_volatility	stop_dec	stop_less_reg	stop_hack	stop_app_fail	stop_money_loss	stop_less_gain
N	43	43	43	43	43	43	43
Mean	4.19	2.86	3.44	3.47	2.47	3.95	2.67
Median	4	3	4	4	3	4	2
Mode	4	3	4	4	3	5	2

As seen in the tables above, seven questions are asked to users who have used and stopped to use cryptocurrencies to investigate the factors that affect the behavior of stopping using cryptocurrencies. In the survey order of the answer to likert-type questions was designed as 1 equals strongly disagree and 5 equals strongly agree. 51,2% of the users agree and 34,9% of users strongly agree that the volatility of the cryptocurrencies causes them to stop to use them. When the decentralized structure was asked, 58,1% of the users stated that they do not know. 48,8% of users agree that the lack of regulations related to cryptocurrencies is one of the reasons that cause them to stop using them and 20,9% asserted that they do not know if it could be a reason or not. 39,5% of the users who have stopped to use cryptocurrencies agree that hack incidents are one of the reasons why they stop to use cryptocurrencies. 34,9% of them do not know when they consider the application failures as one of the reasons of stop to use of cryptocurrencies, 25,6% of them strongly disagree, and 23,3% of them disagree that it is one of the reasons. As expected majority of the users agree and strongly agree that money loss is one of the reasons why they stop to use cryptocurrencies. When money loss is asked as one of the reasons why they stop to use, 44,2% of the users strongly agree, and 30,2% of them agree that it is one of the reasons. 34,9% of the users stated that they disagree and 18,6% of them strongly disagree that more profitable options are one of the reasons to stop using cryptocurrencies. 90.7% of the users started to invest in FX/gold instead of cryptocurrencies, 4.7% of users started to invest in cars instead of cryptocurrencies, 2,3% of users started to invest in shares, and 2.3% of them started to invest in property/land instead of cryptocurrencies. When the descriptive statistics related to answers to these even questions are evaluated, money loss from cryptocurrency investment, the volatility of the cryptocurrencies, low level of regulations related to cryptocurrencies, and hacking incidents related to them are notable since these

variables have a mode equal to 5 and 4, which corresponds to strongly agree and agree as an answer in sequence. This result indicates that the money loss from cryptocurrency investment is the most important reason that causes to stop using cryptocurrencies for users.

Table 4.11: Frequency Distribution of the Answers to Questions Related to Using Cryptocurrencies Again

Category	Frequency	Percentage (%)
Start to use again if cryptocurrencies become more stable		
Strongly Disagree	5	11.6
Disagree	3	7.0
Do not Know	14	32.6
Agree	20	46.5
Strongly Agree	1	2.3
Start to use again if cryptocurrencies become more profitable		
Strongly Disagree	4	9.3
Disagree	7	16.3
Do not Know	11	25.6
Agree	15	34.9
Strongly Agree	6	14.0
Start to use again if cryptocurrencies become more secure		
Strongly Disagree	5	11.6
Disagree	6	14.0
Do not Know	8	18.6
Agree	18	41.9
Strongly Agree	6	14.0

Table 4.11 (continued)

Never start to use cryptocurrencies again		
Strongly Disagree	11	25.6
Disagree	17	39.5
Do not Know	5	11.6
Agree	2	4.7
Strongly Agree	8	18.6

Four questions are asked to answer by users who used and stopped to use cryptocurrencies, and answers to these questions can be seen in the table above. As stated in the part of the descriptive statistics, money loss from cryptocurrency investment, the volatility of the cryptocurrencies, low level of regulations related to cryptocurrencies, and hacking incidents related to them are the most considered issues when users consider the reasons why they stop to use cryptocurrencies. Consistently with this result, 46,5% of the users who stopped to use cryptocurrencies indicated that if cryptocurrencies become more stable, then they would start to use them again. When it was asked if cryptocurrencies have become more stable than before, 46,5% of the users indicated that they agree with this idea. Also, consistent with the result of hacking incidents which cause stop the use of cryptocurrencies by users, 41,9% of the users agree that if cryptocurrencies have become more stable, then they would start to use them again. 34,9% of the users who stop to use cryptocurrencies agree that they could start to use cryptocurrencies if cryptocurrencies have become more profitable than other investment options. 25,6% of the users indicated that they do not agree with the idea that if cryptocurrencies become more profitable, then they will start to use them again. 39,5% of the users implied that they disagree, and 25.6% of users implied that they strongly disagree with the idea of never using cryptocurrencies again. These results indicate that even though they have stopped to use cryptocurrencies, the majority of them lean toward using cryptocurrencies again.

Table 4.12: Demographic Information of Users Who Have Never Used Cryptocurrencies

Category	Frequency	Percentage (%)
Gender		
Female	26	49.1
Male	27	50.9
Age (years)		
18-24	19	38.5
25-30	15	28.3
31-40	7	13.2
Over 40 years	12	22.6
Education		
High school	15	28.3
College	5	9.4
Bachelor's degree	30	56.6
Master's degree	3	5.7

As seen in the table above, 49,6-1% of the users who have never used cryptocurrencies are female, and 50,9% of them are male. Compared to cryptocurrency users in the sample, female participants are mostly among the group of people who have never used cryptocurrencies. Age distribution of the users who have never used cryptocurrencies before is as follows: 35,8% of them are among the 18-24 years, 28,3% of them are among the 25-30 years, 13,2% of them are among the 31-40 years and 22,6% of them are among the over 40 years. 28,3% of the users who have never used cryptocurrencies before have a high school degree, 9,4% of them have a college degree, 56,3% of them have a bachelor's degree, and 5,7% of them have a master's degree. When the demographic information of users who have never used cryptocurrencies before with cryptocurrency users among participants, the former group is more equally distributed in terms of gender and younger than the latter group. The two groups have a similar distribution of education which is the majority of the people have bachelor's degrees in the two groups.

Table 4.13: Frequency Distribution of the Answers to Questions Related to Never Using Cryptocurrencies

Category	Frequency	Percentage (%)
Income Level		
Below 1000 TL	9	17.0
1001-5000 TL	11	20.8
5001-1000 TL	13	24.5
Over 10000 TL	20	37.7
Source of Knowledge		
Social media	21	39.6
Friends	29	54.7
Web pages	3	5.7
Knowledge Level		
I have no idea about cryptocurrencies	1	1.9
I've heard of cryptocurrencies, but I don't know what they are	15	28.3
I have some knowledge of cryptocurrencies	35	66.0
I know a lot about cryptocurrencies	2	3.8
Never used cryptocurrencies due to high level of volatility		
Strongly Disagree	4	7.5
Disagree	5	9.4
Do not Know	10	18.9
Agree	28	52.8
Strongly Agree	6	11.3
Never used cryptocurrencies due to the decentralized structure of cryptocurrencies		
Strongly Disagree	7	13.2
Disagree	11	20.8
Do not Know	14	26.4
Agree	12	22.6
Strongly Agree	9	17.0

Table 4.13 (continued)

Never used cryptocurrencies due to less regulations related to cryptocurrencies		
Strongly Disagree	3	5.7
Disagree	6	11.3
Do not Know	17	32.1
Agree	17	32.1
Strongly Agree	10	18.9
Never used cryptocurrencies due to hack incidents related to cryptocurrencies		
Strongly Disagree	4	7.5
Disagree	5	9.4
Do not Know	8	15.1
Agree	23	43.4
Strongly Agree	13	24.5
Never used cryptocurrencies due to money loss of friends		
Strongly Disagree	3	5.7
Disagree	4	7.5
Do not Know	10	18.9
Agree	9	17.0
Strongly Agree	27	50.9
Never used cryptocurrencies due to high level of risk of cryptocurrencies		
Strongly Disagree	2	3.8
Disagree	2	3.8
Do not Know	8	15.1
Agree	17	32.1
Strongly Agree	24	45.3
Never used cryptocurrencies due less knowledge related to cryptocurrencies		
Strongly Disagree	2	3.8
Disagree	1	1.9
Do not Know	8	15.1
Agree	17	32.1
Strongly Agree	25	47.2
Never used cryptocurrencies due to more profitable investment options		

Table 4.13 (continued)

Strongly Disagree	12	22.6
Disagree	22	41.5
Do not Know	6	11.3
Agree	6	11.3
Strongly Agree	7	13.2
Never used cryptocurrencies due to moral reasons		
Strongly Disagree	33	62.3
Disagree	10	18.9
Do not Know	3	5.7
Strongly Agree	7	13.2

The descriptive information in the table above is related to participants among the group of people who have never used cryptocurrencies before. 17% of this group have less than 1000 TL income, 20,8% of them have 1001-5000 TL income, 24,5% of them have 5001-10000 TL income, and 37,7% of them have over 10000 TL income. Similar to the cryptocurrency users in the participants, this group of people has heard about cryptocurrencies mostly through social media and friends. 54,7% of them heard about cryptocurrencies from friends, 39,6% of them heard about cryptocurrencies on social media, and 5,7% of them heard about cryptocurrencies from web pages. 66% of this group of people asserted that they have some knowledge about cryptocurrencies, 28,3% of them indicated that they have heard of but do not have knowledge about cryptocurrencies, 3,8% of them indicated that they know a lot about cryptocurrencies, and 1,9% of them indicated that they have no idea about cryptocurrencies. Nine questions were asked to this group of people to investigate the possible reasons why they have never used cryptocurrencies before. 52,8% of them agree that a high level of volatility is one of the reasons that cause them to never use cryptocurrencies before. When the decentralized structure of cryptocurrencies is asked as a reason for why they have never used cryptocurrencies before, answers are distributed close to each other proportionally. 17% of them strongly agree that the decentralized structure of cryptocurrencies is one of the reasons, 13,2% of them strongly disagree with this idea, 22,6% of them agree, 20,8% of them disagree, and 26,4% of them do not know whether this is one of the reasons or not. Even though answers are distributed close to each other, having no idea about decentralized structure as a reason for not using

cryptocurrencies indicates that non-users are not aware of the inherited structure of the cryptocurrencies. 32,1% of this group agree that fewer regulations related to cryptocurrencies are one of the reasons why they have never used them before, 32,1% of them do not know about this idea, and 18,9% of them strongly agree with this idea. 43,4% of them agree that hack incidents related to cryptocurrencies are one of the reasons why they have never used them before, and 24,5% of them strongly agree with this idea. When the loss of money by a friend related to cryptocurrencies was asked as a reason, 50,9% of them indicated that they strongly agree with this idea, and 17% of them agreed with this idea. When the high level of risk related to cryptocurrency is asked as a reason for why they have never used them before, 45,3% of this group strongly agree with this idea, and 32,1% of them agree with this idea. 47,2% of this group strongly agree that less knowledge about cryptocurrencies is one of the reasons why they have never used them before, and 32,1% of them agree with this idea. 41,5% of them strongly disagree, and 22,6% of them disagree that the existence of more profitable investment options is one of the reasons why they have never used cryptocurrencies before. 62,3% of them strongly disagree, and 18,9% of them disagree that their moral standards are one of the reasons that cause them not to use cryptocurrencies.

Table 4.14: Descriptive Statistics of the Answers to Questions Related to Never Using Cryptocurrencies

Variables	Volatility	Decentralization	Lack of Regulations	Hack Incidents	Friend's Money Loss	Risky	Lack of Knowledge	Other Profitable Options	Moral Values
N	53	53	53	53	53	53	53	53	53
Mean	3.51	3.09	3.47	3.68	4.00	4.11	4.17	2.51	1.83
Median	4	3	4	4	5	4	4	2	1
Mode	4	3	3	4	5	5	5	2	1

As seen in the table above, the mode of the three questions is equal to 5, which corresponds strongly to agree as an answer, and two of the questions have a value of mode equal to 4, which corresponds to agree as an answer. Values in the table above interpreted as the money loss of a friend from cryptocurrency investment, the risk level of cryptocurrencies, and lack of knowledge about cryptocurrencies are among the most impacted reasons on the behavior of these groups as they have never used cryptocurrencies before. Also, volatility in the price of cryptocurrencies, and being

objected to hacking incidents are among the significant reasons for not using cryptocurrencies before. Among these five reasons, the money loss of a friend from cryptocurrency investment is salient with a median value equal to 5, which makes it the most impacted reason for not using cryptocurrencies.

Table 4.15: Frequency Distribution of the Answers to Questions Related to Start Using Cryptocurrencies

Category	Frequency	Percentage (%)
Start to use again if cryptocurrencies become more stable		
Strongly Disagree	5	9.4
Disagree	7	13.2
Do not Know	20	37.7
Agree	18	34.0
Strongly Agree	3	5.7
Start to use again if cryptocurrencies become more regulated		
Strongly Disagree	4	7.5
Disagree	5	9.5
Do not Know	15	28.3
Agree	19	35.8
Strongly Agree	10	18.9
Start to use again if cryptocurrencies become more secure		
Strongly Disagree	4	7.5
Disagree	4	7.5
Do not Know	15	28.4
Agree	18	34.0
Strongly Agree	12	22.6
Start to use again if cryptocurrencies become less risky		
Strongly Disagree	5	9.4
Disagree	2	3.8
Do not Know	10	18.9
Agree	23	43.4
Strongly Agree	13	24.5

Table 4.15 (continued)

Start to use again if my knowledge level increases		
Strongly Disagree	4	7.5
Disagree	4	7.5
Do not Know	6	11.3
Agree	21	39.6
Strongly Agree	18	34.0
Start to use again if cryptocurrencies become more profitable		
Strongly Disagree	7	13.2
Disagree	20	37.7
Do not Know	12	22.6
Agree	6	11.3
Strongly Agree	8	15.1
Never start to use cryptocurrencies		
Strongly Disagree	18	34.0
Disagree	22	41.5
Do not Know	9	17.0
Strongly Agree	4	7.5
Cryptocurrencies are going to extinct in the future		
Strongly Disagree	22	41.5
Disagree	16	30.2
Do not Know	9	17.0
Agree	3	5.7
Strongly Agree	3	5.7
Cryptocurrencies are going to be future money		
Strongly Disagree	5	9.4
Disagree	4	7.5
Do not Know	15	28.3
Agree	20	37.7
Strongly Agree	9	17.0

Seven questions are asked of participants who have never used cryptocurrencies before to investigate the factors that could affect their behavior as they start using cryptocurrencies. Also, two questions are asked of this group of participants to get their opinions about the future of cryptocurrencies. The distribution of the answer to these nine questions can be seen in the table above. 37,7% of the non-users indicated

that they do not know if cryptocurrencies became more stable, they could start to use cryptocurrencies 34% of this group of participants agreed that if cryptocurrencies become more stable, they could start to use them. When regulations related to cryptocurrencies are asked as a condition for starting to use cryptocurrencies, 35,8% of them indicated that they agree with this idea, 28,3% of them indicated that they do not know, and 18,9% strongly agreed that if more regulations are made related to cryptocurrencies, they could start to use them. The security of cryptocurrencies is one of the conditions that the majority of this group is considering as a condition to start using cryptocurrencies. 34% of them agree, and 22,6% of them strongly agree that if cryptocurrencies have become more secure, then they could start to use cryptocurrencies. The risk level of cryptocurrencies is also considered an important condition to start using cryptocurrencies. 43,4% of this group agreed, and 24,5% of this group strongly agreed that if cryptocurrencies become less risky, then they could start using cryptocurrencies. Participants who have never used cryptocurrencies before put emphasis on their knowledge level about cryptocurrencies. As stated before, knowledge level about cryptocurrencies is among the most impacted reasons why they have never used them. Consistently with this result, 39,6% of this group agree, and 34% of them strongly agree that if their knowledge level about cryptocurrencies increases, they could start to use them. 37,7% of this group disagree with the idea that if cryptocurrencies become more profitable, they could start using them. 22,6% of them indicated that they do not know if cryptocurrencies become more profitable than they could start using them. 34% of them strongly disagree that they will continue not to use cryptocurrencies, and 41,5% of them disagree with that idea. When the questions related to the future of cryptocurrencies are asked, 41,5% of this group strongly disagree, and 30,2% of them disagree that cryptocurrencies are going to become extinct in the future. 37,7% of them agree, 17% of them agree that cryptocurrencies become the future money, and 28,3% of them indicated that they do not know whether cryptocurrencies are going to be the future money or not.

Table 4.16: Descriptive Statistics of the Answers to Questions Related to Start Using Cryptocurrencies

Variables	More Stable	More Regulated	More Secure	Low-Risk Level	More Knowledge	More Profitable	Never Use
N	53	53	53	53	53	53	53
Mean	3.13	3.55	3.58	3.70	3.85	2.77	2.06
Median	3	4	4	4	4	2	2
Mode	3	4	4	4	4	2	2

Factors that might affect the behavior of participants who start using cryptocurrencies and who have never used cryptocurrencies before are investigated, and the results are shown. It can be interpreted that; this group of participants tends not to use cryptocurrencies due to certain reasons, and if these reasons change, then they might start using cryptocurrencies. As seen in the table above, the mode of the answer to the statement "I will never use cryptocurrencies" is 2, which equals disagree. This result support that people in this group could use cryptocurrencies if certain conditions are satisfied. As stated, having less knowledge about cryptocurrencies is the salient reason for not using cryptocurrencies, and the mode of the answer to the statement that "if my knowledge increases, I could start to use cryptocurrencies" is four, which equals agree. Along with knowledge level, people in this group considered the increase in the security of cryptocurrencies, increase in the regulation level of cryptocurrencies, and decrease in the risk level of them as important reasons to start using cryptocurrencies

4.11. Conclusion

Cryptocurrencies are a new phenomenon that draws attention globally, and Turkey is one of the prominent countries in terms of having cryptocurrency users. Preliminary research on the evolution of cryptocurrencies in Turkey resulted that Turkey being one of the "latecomers" developing countries in terms of cryptocurrency evolution. Cryptocurrency user numbers peaked in 2021 and google search data indicated that people had put attention on cryptocurrencies highest in 2021 in Turkey. Preliminary research showed that cryptocurrency users had experienced different types of use like NFTs and most of the users tend to invest in meme coins like SHIB and DOGE. Also, the implementation of an exchange tax when people buy foreign exchange cause an increase in cryptocurrency use due to the absence of any kind of tax for cryptocurrency

investment. Even though there are regulations related to cryptocurrencies in Turkey, regulations are not comprehensive for cryptocurrencies which mainly focus on anti-money laundering and financing of terrorism. Research related to cryptocurrency use in Turkey suggested that deterioration in macro-economic indicators like high level of CPI, decrease in GDP per capita, and depreciation in the Turkish Lira cause an increase in cryptocurrency use.

The objective of this study is to underline the factors of cryptocurrency adoption in Turkey and investigate the findings of preliminary research by developing a structural model. Survey-based analyses are made for a better understanding of factors related to cryptocurrency adoption in Turkey, and data from surveys are used for conducting SEM. Standardized open-ended interviews are made with five people to create the survey questions, and questions are designed to be in four sections. Demographic information of participants was collected in the first section. In the other three sections, questions are designed to collect data from people who have used and continue to use cryptocurrencies, who used but stopped using, and who have never used them. Descriptive statistics are used to analyze the data from participants who used and stopped to use cryptocurrencies. Descriptive statistics are used for analyzing data, and SEM analyses are used for testing six hypotheses via using data from participants who used and stopped to use cryptocurrencies and who have never used them before. Data from fifty-seven participants are used for conducting such analyses. Even though the gender distribution of the total participants was balanced, there was only one female cryptocurrency user in the sample. Younger people who have a bachelor's degree constituted the majority of the participants. When data analysis is compared with the preliminary research, being a latecomer country is supported. All of the cryptocurrency users started to use up to three years before, and 89.6% of them indicated that they had used cryptocurrencies most in 2021. The tendency to meme coins is also supported by the data analysis. 51,2% of the cryptocurrency users remarked that they have invested in SHIB, DOGE, and other altcoins. The relationship between deterioration in the macroeconomic indicators and cryptocurrency adoption was supported by descriptive statistics. 59,7% of the cryptocurrency users strongly agree, and 31,2% of the users agree that a high level of inflation causes them to use cryptocurrencies. Furthermore, as stated before, 59,7% of users strongly agree, and 31,2% of them agree that volatility

in the foreign exchange rate causes them to use cryptocurrencies. The absence of tax implementation for cryptocurrency usage as a reason for the tendency to use them is supported by the data. It resulted that 24,7% of the users strongly agree, and 20,8% of them agree that the absence of tax implementation contributed to their cryptocurrency use.

Structural modeling methods and descriptive statistics were used to conduct comprehensive analyses for investigating the factors that cause people to tend to use cryptocurrencies. Six hypotheses were tested using SEM, and three of them were found to be statistically significant within a 95% confidence interval. It is found that perceived usefulness had a significant positive impact on the intention to use cryptocurrencies with $\beta=0.68$; $p<0.05$, perception of cryptocurrencies had a significant positive effect on the intention to use cryptocurrencies with $\beta=0.62$; $p<0.05$, and image of cryptocurrencies had a significant positive effect on the intention to use cryptocurrencies with $\beta=0.53$; $p<0.05$. Descriptive statistics are used to analyze data from collected users who used and stopped to use cryptocurrencies and who have never used them before. It is found that the money loss of a friend from cryptocurrency investment is the most accepted reason why they stopped to use cryptocurrencies. Also, the volatility of cryptocurrencies, lack of adequate regulations related to cryptocurrencies, and hacking incidents related to cryptocurrencies were the three most accepted reasons why they stopped to use cryptocurrencies. Also, it has resulted that the majority of the users who stopped to use cryptocurrencies could start them aging if they became more stable and secure. It has resulted that, females tend not using cryptocurrencies more than males. Money loss of a friend from cryptocurrency investment, having less knowledge related to cryptocurrencies, and the risk level of cryptocurrencies are the most indicated reasons for not using cryptocurrencies. Also, the volatility of cryptocurrencies and hack risk are considered reasons for not using cryptocurrencies, as well as in the group of cryptocurrency users who stopped to use them. It has resulted that the majority of the participants who never used cryptocurrencies before agreed that cryptocurrencies will not be extinct in the future, and if certain conditions are satisfied, they could start to use cryptocurrencies like having more knowledge about them, if regulation level related to cryptocurrencies increases, and increase the security level of using cryptocurrencies.

As stated above, one of the results of this study indicates that people who never used cryptocurrencies and who stopped to use cryptocurrencies could start to use cryptocurrencies if certain conditions are satisfied. This result has importance in terms of financial integration and cryptoization risk. As stated in the second chapter cryptoization risk is more conceivable in developing countries, and if cryptoization reaches a certain level, monetary and fiscal policies could be affected detrimentally. Financial integration is among one the potential benefits of cryptocurrency use in developing countries. Since people considered their knowledge level and the level of regulations related to cryptocurrencies as factors for starting to use them, a more regulated market for cryptocurrencies could increase participation and provide more control to regulatory institutions in Turkey for conducting monetary policy and fiscal policy broader. When the legal framework of cryptocurrencies in Turkey is considered, it is suggested that cryptocurrencies need to be more regulated.

Finally, there were limitations to this study. It is aimed to analyze cryptocurrency adoption in Turkey via using survey-based data, and only data from 130 participants are used for analysis. Also, surveys were conducted in limited environments such as university campuses, institutions, and public places in Ankara. Due to the lack of a high number of participants in the sample, results may not be generalized to Turkey.

CHAPTER 5

CONCLUSION

Cryptocurrencies have drawn the attention of individuals and institutions since the invention of bitcoin, which is the first decentralized cryptocurrency (Nakamoto, 2008). The objective of this study is to provide elaborated information about this novel topic and investigate the adoption of cryptocurrencies in Turkey. One of the contributions of this study is the demonstration of cryptocurrency evolution worldwide and the potential risks and benefits related to them. There are two approaches in terms of evaluating the potential effects of cryptocurrencies on the countries' economies. While some studies stand up for the innovation aspect of cryptocurrencies, some studies focus on their detrimental effects of them. This study stands for the necessity of cryptocurrency regulations for both preventions of detrimental effects and benefits of positive effects related to cryptocurrencies. This study contributes to cryptocurrency literature by showing that cryptocurrencies affect developing and advanced countries' economies at different levels due to the difference between these country groups in terms of the strength of the financial system, the economic development level, and regulations related to cryptocurrencies. It has shown that there are three factors that determine the impact level of cryptocurrencies on the countries' economies. Financial development level, regulations related to cryptocurrencies, and adoption level of them by people influence the impact level of potential detrimental and beneficial impacts. People in advanced countries do not show interest in cryptocurrencies as much as in developing countries in favor of the existence of a strong economy. On the other hand, High levels of unemployment, inflation, and currency depreciation cause a higher interest in cryptocurrencies in developing countries. People approach cryptocurrencies as an alternative tool to protect their savings and gain far too much profit than conventional investments in developing countries. This study stands up for different

country groups to evaluate the evolution of cryptocurrencies for each economy and regulate them to get more benefits and fewer detriments. Especially for developing countries, legal authorities need to regulate cryptocurrencies carefully due to the higher impacts of cryptocurrencies on their economies than in advanced countries. This study contributes to economics and finance by investigating the adoption of cryptocurrencies in Turkey. Survey-based analyses were made for three groups of people who use cryptocurrencies, those who used and stopped to use them, and who have never used them before. Six hypotheses are tested using data from participants who have experienced cryptocurrency structural model analyses. Three of the hypotheses were found statistically significant. It is found that perceived usefulness ($\beta=0.61$; $p<0.05$), perception of cryptocurrencies ($\beta=0.62$; $p<0.05$), and the image of cryptocurrencies ($\beta=0.53$; $p<0.05$.) affect the intention to use cryptocurrencies. It is found that Turkey is among one the latecomer countries, and macro-economic deterioration in Turkey and cryptocurrency users tend to invest in meme coins to get high profit from their investment. It is found that participants who stopped to use and who have never used them start to use cryptocurrencies if certain conditions are satisfied, like an increase in the regulation level of cryptocurrencies, an increase in their knowledge level about cryptocurrencies, and a decrease in the risk level of cryptocurrencies. It is suggested that cryptocurrencies need to be regulated when the high number of users and the tendency to use cryptocurrencies by non-users are considered. Regulations need to focus on getting more benefits from the diffusion of cryptocurrencies and decreasing their potential detrimental effects. Cryptoization risk and financial integration topics need to be evaluated carefully to get more benefits and less harm from cryptocurrency diffusion.

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Roca, J. C., Chiu, C.-M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. International Journal of Human-Computer Studies, 64(8), 683–696.

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APPENDICES

A. APPROVAL OF THE METU HUMAN SUBJECTS ETHICS COMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

04 AĞUSTOS 2022

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Hasan CÖMERT

Danışmanlığını yürüttüğünüz Burak Yunus Yılmaz'ın "Gelişmiş Ve Gelişmekte Olan Ülkelerde Kripto Paralara Artan İlgi: Türkiye Örneği" başlıklı araştırmanız İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek gerekli onay **0406-ODTUİAEK-2022** protokol numarası ile onaylanmıştır.

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Mine MISIRLISOY
Başkan

Doç. Dr. I.Semih AKÇOMAK
Üye

Dr. Öğretim Üyesi Müge GÜNDÜZ
Üye

Dr. Öğretim Üyesi Şerife SEVİNÇ
Üye

Dr. Öğretim Üyesi Murat Perit ÇAKIR
Üye

Dr. Öğretim Üyesi Süreyya ÖZCAN KABASAKAL
Üye

Dr. Öğretim Üyesi A. Emre TURGUT
Üye

B. QUESTIONNAIRE

Kripto Paralara Artan İlgiyi Ölçme Anketi

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1. BÖLÜM

Yaş (Yıl Cinsi): Kaç yaşındasınız? _____

Cinsiyet: (1) Erkek (2) Kadın (3) Diğer

Eğitim (En Son Mezun Olunan Seviye): (1) Orta Okul (2) Lise (3) Ön Lisans (4) Lisans (5) Yüksek Lisans (6) Doktora

Gelir düzeyi (TL Cinsi Aylık Gelir): Aylık geliriniz ne kadardır? _____

Kripto paraları nereden duydunuz? (1) Sosyal medya (2) Arkadaş çevresi (3) Haberler (4) İnternet siteleri (5) Reklamlar (6) Diğer _____

Kripto paralar ile ilgili bilgi düzeyinizi nasıl tanımlarsınız?

(1) Kripto paralarla ilgili bilgi düzeyim çok yüksektir

(2) Kripto paralarla ilgili bilgi düzeyim yüksektir

(3) Kripto paralarla ilgili temel düzeyde bilgi sahibiyim

(4) Kripto paraları duydum ancak ne olduklarını bilmiyorum

(5) Kripto paralarla ilgili hiçbir fikrim yok

Daha önce kripto paralarla işlem yaptınız mı? (Bu soruya cevabınız evet is 2.BÖLÜM sorularını hayır ise 4.BÖLÜM sorularını yanıtlayınız.) (1) Evet

(2) Hayır

2.BÖLÜM

Şu anda aktif olarak kripto paralarla işlem yapmaya devam ediyor musunuz? (Bu soruya cevabınız evet ise sadece 2.BÖLÜM sorularını hayır ise 2.BÖLÜM ve 3.BÖLÜM sorularını yanıtlayınız.)

(1) Evet

(2) Hayır

Kripto paralarla ilk işlemnizi ne mana yaptınız?

(1) 1 yıl önce

(2) 1-3 yıl önce

(3) 3-5 yıl önce

(4) 5 yıldan daha önce

Daha önce hangi kripto paralar ile işlem yaptınız ?

(1) Bitcoin (BTC)

(2) Ethereum (ETH)

(3) Tether (USDT)

(4) Binance Coin (BNB)

(5) Shiba Inu (SHIB)

(6) Dogecoin (DOGE)

(7) Diğer ___/____/___

Kripto paraların dışında hangi yatırım araçlarını kullanıyorsunuz?

(1) Döviz/Altın

(2) Ev/Arsa

(3) Araba

(4) Hisse senedi

(5) Emtia

(6) Faiz geliri

(7)Diğer ____/____/___

Kripto para işlemlerini en yoğun kullandığınız zaman ne zamandı? (Ay/Yıl)

_____/_____

Kripto para işlemlerinizi nasıl gerçekleştiriyorsunuz?[62]

(1) CeFi (Merkezi Finans)

(2) DeFi (Merkezi Olmayan Finans)

(3) Diğer _____

Işlemlerinizi CeFi ile gerçekleştiriyorsanız hangi kripto para borsalarını kullanıyorsunuz?

(1) Binance

(2) BtcTurk/ BtcTurk Pro

(3) Bitay

(4) Paribu

(5) Diğer:_____

Soruları cevaplamak için aşağıdaki ölçeği kullanınız.

"5 =Tamamen Katılıyorum, 4=Katılıyorum, 3=Kararsızım , 2=Katılmıyorum, 1= Kesinlikle Katılmıyorum"

No	Sorular	5	4	3	2	1

[62]CeFi'da kripto para ile yapılan işlemler bir kripto para borsası üzerinden gerçekleştirilmektedir. DeFi üzerinden yapılan işlemlerde kripto para borsaları kullanılmaz ve tüm süreç blokzincir platformları üzerinde geliştirilen otomatik uygulamalar aracılığıyla gerçekleşir.

1	Ünlü Türk kripto para fenomenlerinin görüşleri kripto para kullanımımı etkiliyor.					
2	Türkiye'deki yüksek enflasyon, kripto para kullanımımı artırıyor.					
3	Türkiye'de kripto para işlemlerinde herhangi bir vergiye tabi olmamak kripto para kullanımımı artırıyor.					
4	Döviz kurundaki yüksek oynaklık kripto para kullanımımı etkiliyor.					
5	Kripto paraları yatırım yapamak amacıyla kullanırım.					
6	Kripto paraları eğlence amacıyla kullanırım.					
7	Günceli yakalayamamak diğer insanlardan geri kalmak kripto para kullanımımda etkilidir.					
8	Sadece merak ettiğim için kripto paraları kullanırım.					
9	Kripto paraları yurt dışına para transfer işlemleri amacıyla kullanırım.					
10	Kripto paraları düzenli olarak kullanmayı düşünüyorum.					
11	Kripto paraları kullanarak kaldıraçlı işlem yapabilmek kripto para kullanmamda etkilidir.					
12	Kripto paraları kullanmanın borçlarımı zamanında ödeyebilmem için çok yararlı olduğuna inanıyorum.					
13	Başkalarını kripto paralarla kullanmaya teşvik ediyorum.					
14	Önümüzdeki on iki ay içinde kripto paraları kullanmayı planlıyorum.					
15	Para transferi yapmak için kripto paraları kullanmayı tercih ederim.					
16	Kripto paraları ödeme yapmak için kullanıyorum/kullanacağım.					
17	Kripto paralarla işlem yapamayı düşündüğümde para kaybetmekten korkarım.					
18	Kripto paraların anlaşılması veya kullanılmasının kolay olduğunu düşünüyorum.					
19	Kripto para uygulamalarıyla işlem yapmanın kullanıcı dostu olduğunu ve diğer uygulamalara kıyasla (bankacılık uygulamaları gibi) daha kolay olduğunu düşünüyorum.					
20	Kripto paraları kullanarak işlem yapmak gergin bir süreçtir.					
21	Kripto paraları kullanmak, parasal işlemlerimde bana daha fazla özgürlük sağlıyor.					
22	Kripto paraları daha güvenli buluyorum.					
23	Kripto paralarla yapılan parasal işlemlerin anonim olduğunu düşünüyorum.					
24	Kripto paralarla çok daha hızlı para transferi yapabilirim.					
25	Kripto paraları kullanmak hayatımı kolaylaştırıyor.					

26	Kripto paralarla işlem yapmanın diğer yöntemlere göre daha ucuz olduğunu düşünüyorum.					
27	Kripto paralarla işlem yapmanın diğer yöntemlere göre daha şeffaf olduğunu düşünüyorum.					
28	Kripto paraları kullanmak çok küçük bir miktarlarda transfer yapabilmemi sağlıyor.					
29	Kripto paraların fiyatlarındaki yüksek oynaklık benim için bir risk faktörü oluşturuyor.					
30	Kripto paraların kara para aklamak için kullanılma ihtimali benim için bir risk unsurudur.					
31	Kimlik bilgilerim ve yüz resmim gibi kişisel bilgileri kripto para borsaları ile paylaşmak benim için risk faktörü oluşturuyor.					
32	Kripto paraların merkezi olmayan yapısı benim için bir risk faktörü oluşturuyor.					
33	Kripto paraların bilgisayar korsanları tarafından çalınma ihtimali benim için bir risk faktörü oluşturmaktadır.					
34	Kripto paralara yatırım yapmanın akıllıca olduğunu düşünüyorum					
35	Yakın zamanda daha fazla kişinin kripto paraları kullanmaya başlayacağını düşünoyorum.					
36	Kripto para teknolojisinin, finansal sisteme büyük bir yenilik getirdiğini düşünüyorum.					
37	Kripto paraların zamanla yok olacağını düşünüyorum.					
38	Çeşitili kripto para uygulamalarını kullanmanın bana birçok fırsat sunduğunu düşünüyorum. (İlk üyelikte verilen ücretsiz kripto paralar gibi)					
39	Kripto paraların geleceğin parası olacağını düşünüyorum.					
40	Kripto para kullanan kişilerin daha zeki olduğunu düşünüyorum.					
41	Kripto para kullanan kişilerin toplum içinde daha prestijli bir grupta yer aldığını düşünüyorum.					
42	Arkadaş çevremde kripto para kullanmak bir statü sembolü oluşturmaktadır.					
43	Yakın çevremdeki kişiler kripto para kullanmamı istemektedir.					

Kripto paralarla yaptığınız işlemlerde en fazla ne kadar para kazandınız?

(1) 0-1000 TL

(2) 1001-5000 TL

(3) 5001-10000 TL

(4) 10001 TL ve üzeri

Kripto paralarla yaptığınız işlemlerde en fazla ne kadar para kaybettiniz? (TRY)

(1) 0-1000 TL

(2) 1001-5000 TL

(3) 5001-10000 TL

(4) 10001 TL ve üzeri

Nihai durumda kripto para işlemlerin kar/zarar durumu yüzdesel olarak ne kadardır? (Kripto para kullanmayı bıraktıysanız bıraktığınız zamandaki kar/zarar durumunu belirtiniz.)

(_____)

3.BÖLÜM

Bu bölümdeki sorular sadece daha önce kripto paralarla işlem yapmış ancak şu anda işlem yapmayı bırakan kişilerin cevaplaması için oluşturulmuştur.

No	Sorular	5	4	3	2	1
1	Kripto paraların fiyatlarındaki yüksek oynaklık kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					
2	Kripto paraların merkezi olmayan yapısı kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					
3	Kripto paralarla ilgili yapılan düzenlemelerin yetersizliği kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					
4	Kripto paraların çalınması ve yasa dışı faaliyetlerde kullanmılması kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					
5	Kripto paralarla yaptığım işlemlerde yaşadığım akasaklıklar kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					

6	Kripto paralarla yaptığım işlemlerde çok fazla para kaybetmiş olmam kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					
7	Kripto paralara kıyasala daha fazla kazanç sağladağım yatırım araçlarının olması kripto paralarla işlem yapmayı bırakmamda etkili olmuştur.					
8	Kripto paraların fiyatlarındak oynanklık seviyesi daha az olursa tekrar kripto paralarla işlem yapablirim.					
9	Kripto paralarla ilgili daha fazla düzenleme yapılırsa tekrar kripto paralarla işlem yapablirim.					
10	Kripto paralarla yapılan işlemlerdeki güvenlik seviyesinin arttığını düşünürsem tekrar kripto paralarla işlem yapablirim.					
11	Tekrar asla kripto paralarla işlem yapmayı düşünmüyorum.					

Kripto paralarla işlem yapmayı bıraktıktan sonra hangi yatırım araçlarına yöneldiniz?

(1) Döviz/Altın

(2) Ev/Arsa

(3) Araba

(4) Hisse senedi

(5) Emtia

(6) Faiz geliri

(7) Diğer _____/_____/_____

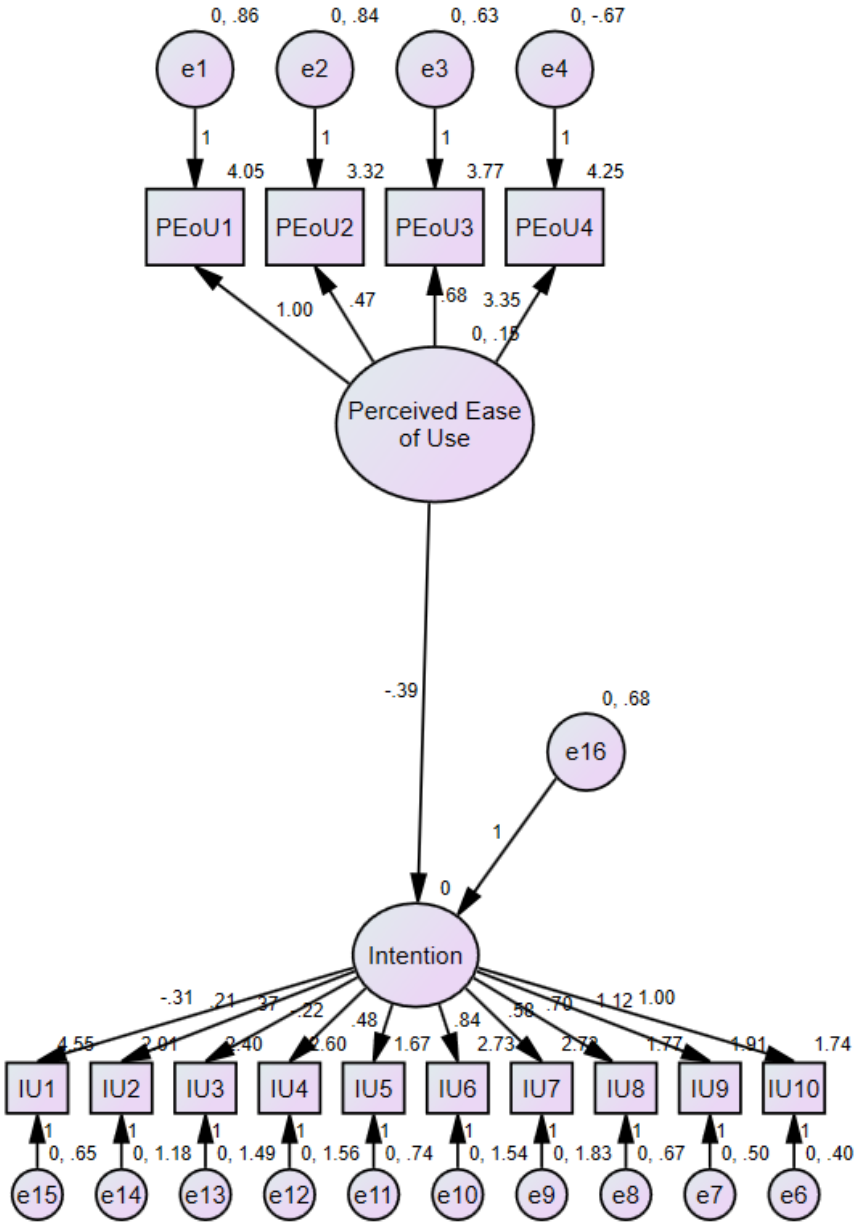
4.BÖLÜM

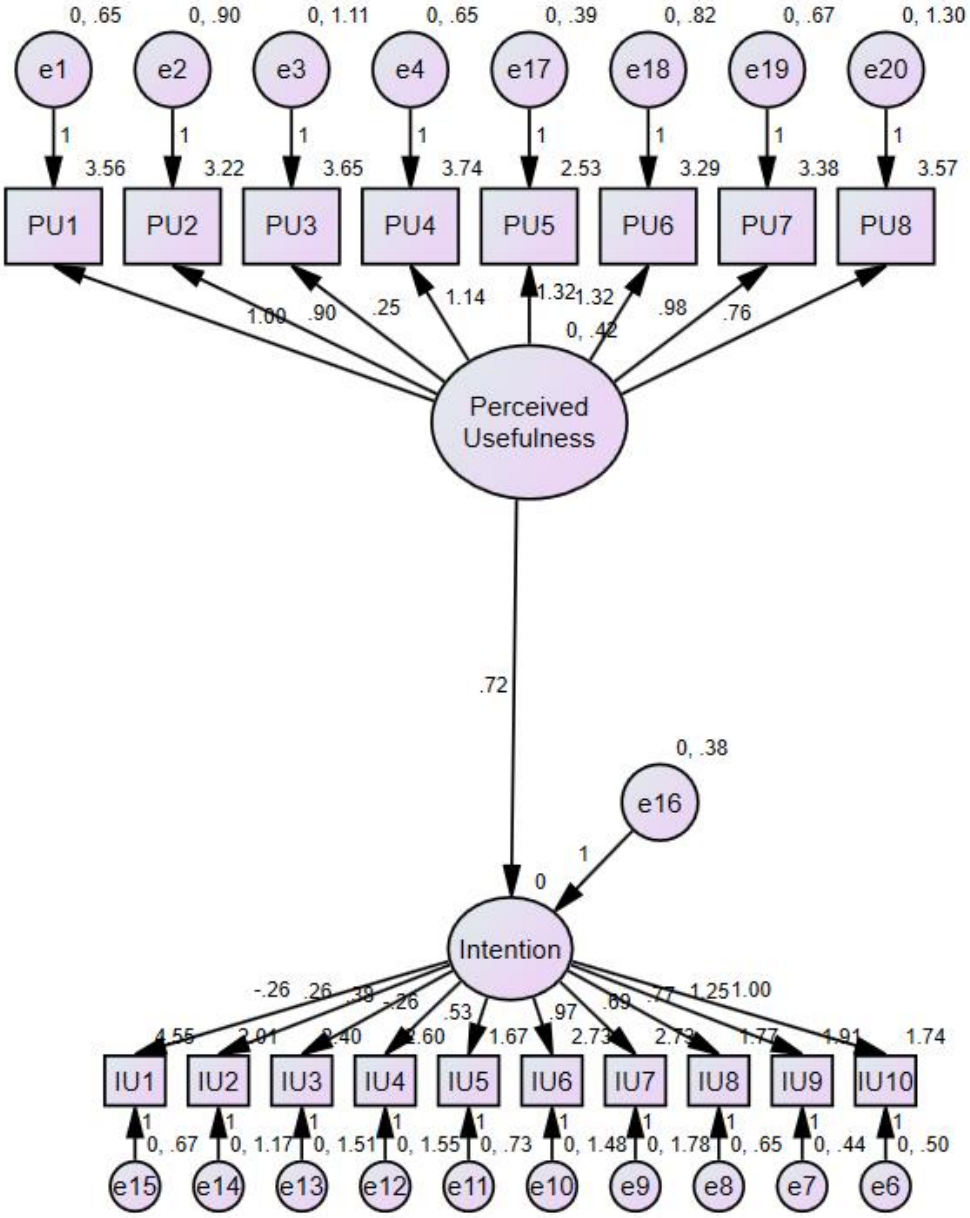
Bu bölümdeki sorular daha önce kripto paralarla hiç işlem yapmamış kişilerin cevaplaması için oluşturulmuştur.

No	Sorular	5	4	3	2	1
1	Kripto paraların fiyatlarındaki yüksek oynaklık kripto paralarla işlem yapmamamda etkili olmuştur.					
2	Kripto paraların merkezi olmayan yapısı kripto paralarla işlem yapmamamda etkili olmuştur.					

3	Kripto paralarla ilgili yapılan düzenlemelerin yetersizliği kripto paralarla işlem yapmamamda etkili olmuştur.					
4	Kripto paraların çalınması ve yasa dışı faaliyetlerde kullanmılması kripto paralarla işlem yapmamamda etkili olmuştur.					
5	Etrafımdaki kişlerin çok fazla para kaybetmesi kripto parlarla işlem yapmamada etkili olmuştur.					
6	Kripto paralarla yapılan işlemlerin çok riskli olduğunu düşünmem kripto parlarla işlem yapmamada etkili olmuştur.					
7	Kripto paralarla ilgili yeterli bilgiye sahip olmamam kripto parlarla işlem yapmamada etkili olmuştur.					
8	Kripto paralara kıyasala daha fazla kazanç sağlayacağımı düşündüğüm yatırım araçlarının varlığı kripto parlarla işlem yapmamada etkili olmuştur.					
9	Kripto paralarla işlem yapmanın etik ve ahlak anlayışıma uygun olmaması kripto parlarla işlem yapmamada etkili olmuştur.					
10	Kripto paraların fiyatlarındaki oynaklık azalırsa kripto paralarla işlem yapabilirim.					
11	Kripto paralarla ilgili yeterli düzenlemeler yapılırsa kripto paralarla işlem yapabilirim.					
12	Kripto paralarla yapılan işlemlerdeki güvenlik seviyesinin arttığını düşünürsem kripto paralarla işlem yapabilirim.					
13	Kripto paralarla yapılan işlemlerin daha az riskli olduğunu düşünürsem kripto paralarla işlem yapabilirim.					
14	Kripto paralarla ilgili yeterli bilgiye sahip olduğumu düşünürsem kripto paralarla işlem yapabilirim.					
15	Kripto para işlemleri ile diğer yatırım araçlarına kıyasla daha yüksek kazanç elde edeceğimi düşünürsem kripto paralarla işlem yapabilirim.					
16	Kripto parlarla asla işlem yapmam.					
17	Kripto paraların zamanla yok olacağını düşünüyorum.					
18	Kripto paraların geleceğin parası olacağını düşünüyorum.					

C. RESULTS OF MEASUREMENT MODELS

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PU4
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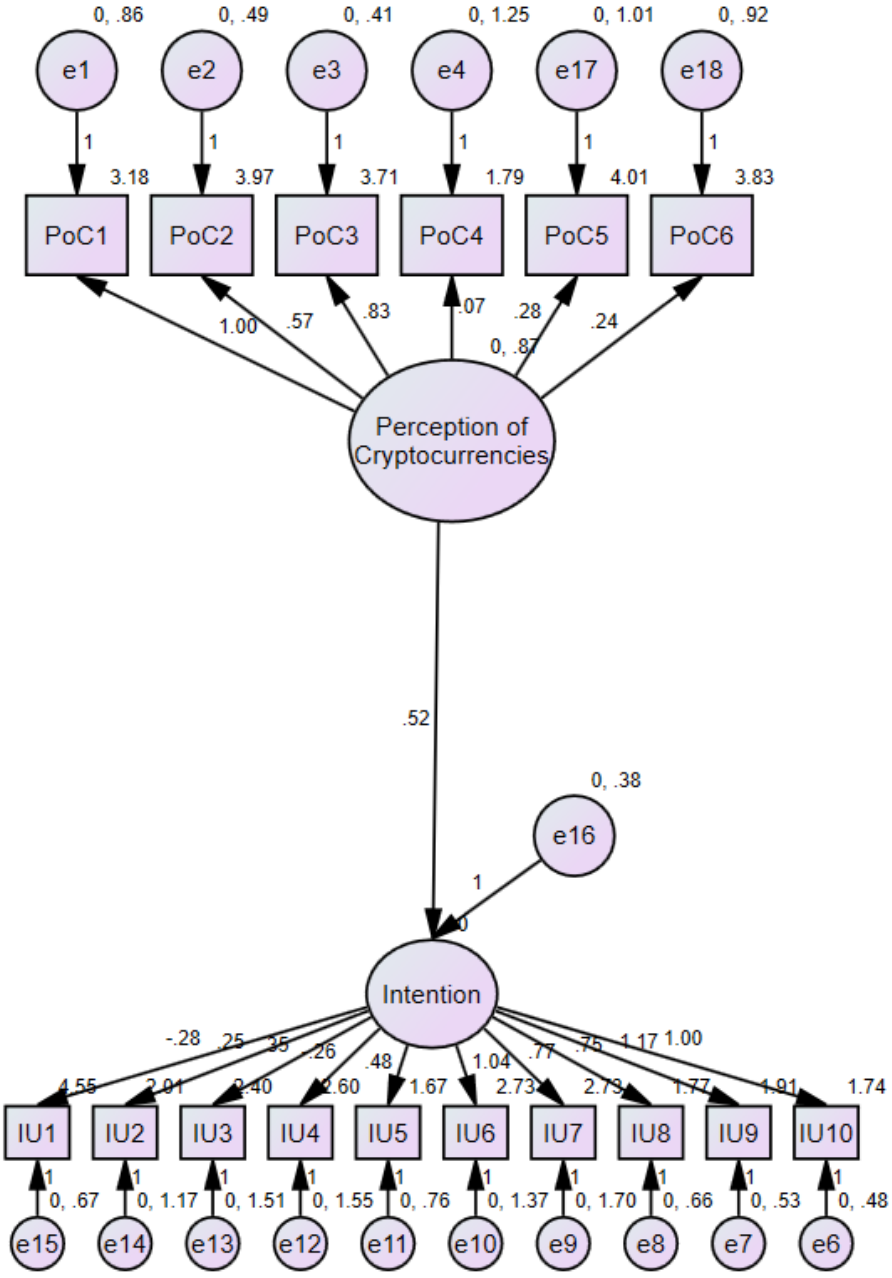
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PoC3
PoC4
PoC5
PoC6
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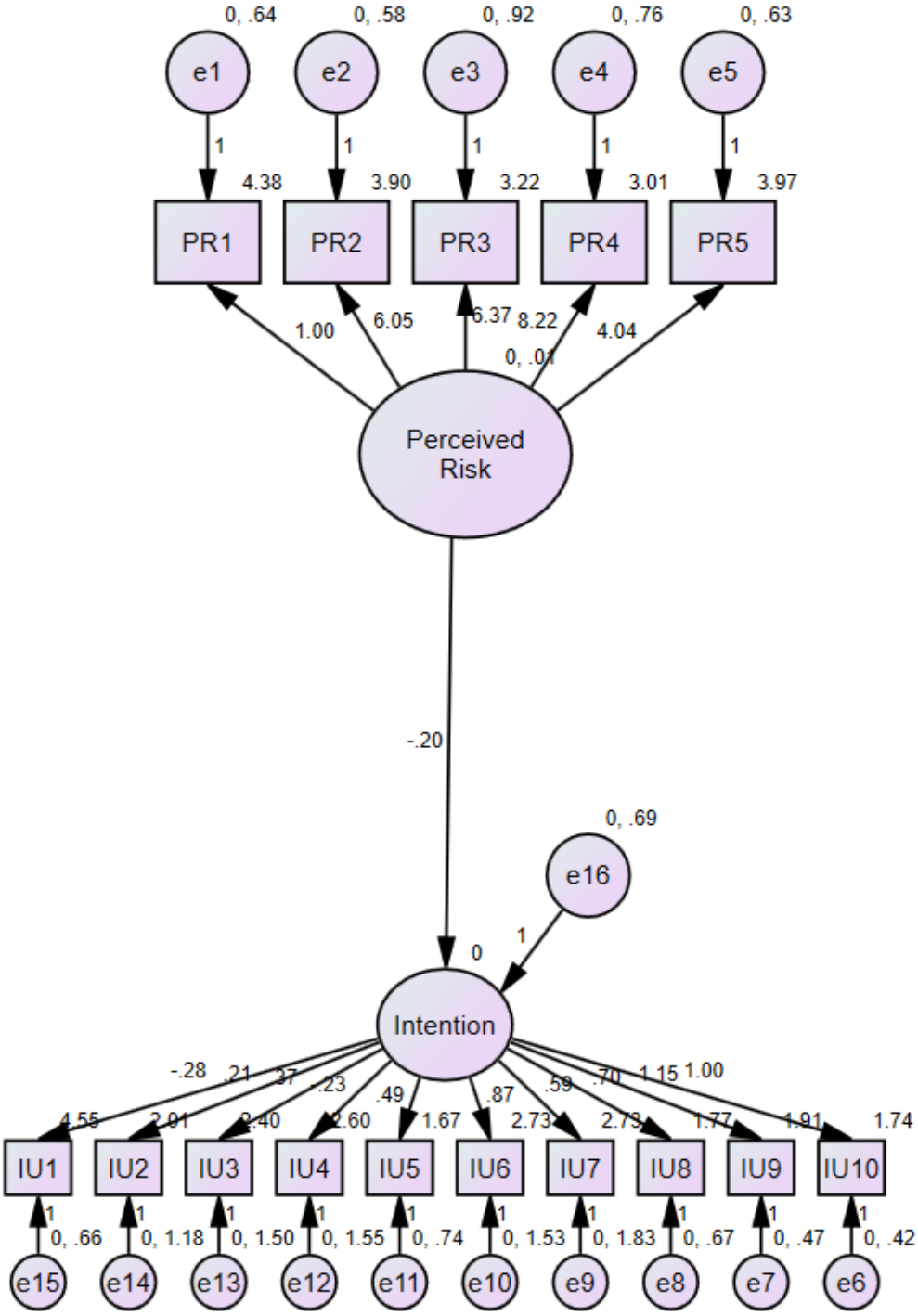
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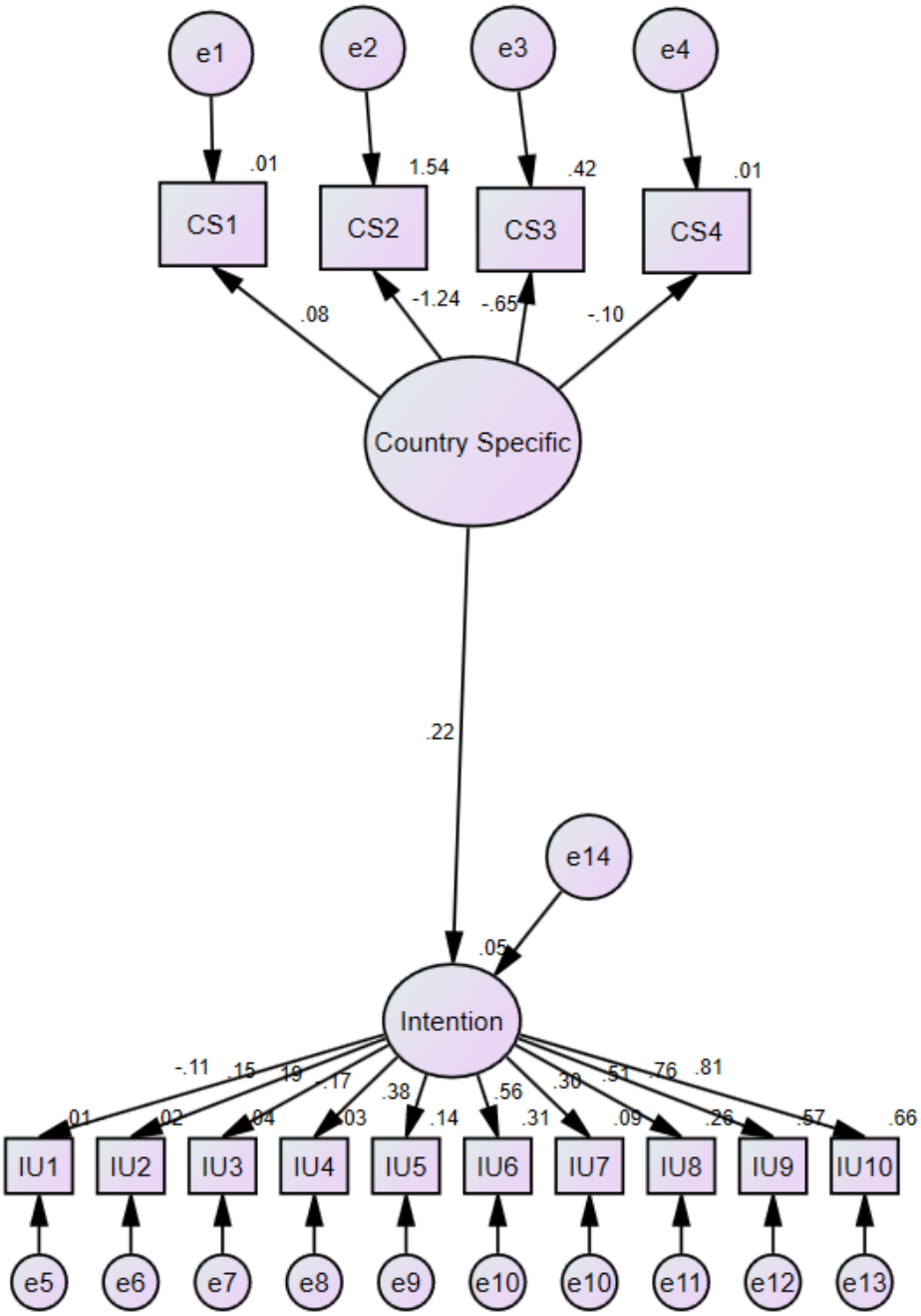
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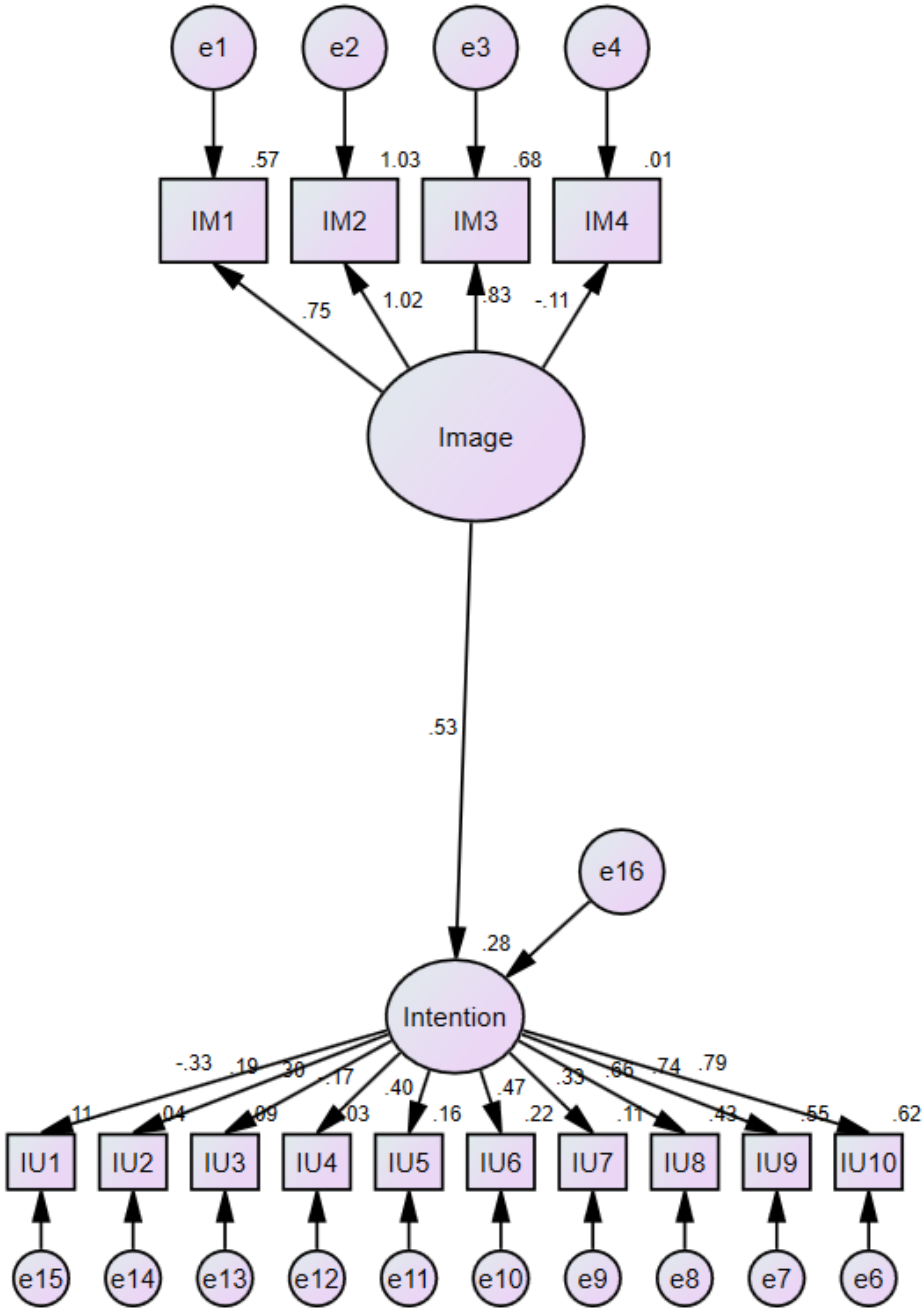
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Regression Weights: (Country Specific Issues - Default model)

			Estimate	S.E.	C.R.	P	Label
F2	<---	F1	1.994	3.722	.536	.592	
famousinfluencersCS1	<---	F1	1.000				
InfCS2	<---	F1	-11.843	24.238	-.489	.625	
TaxCS3	<---	F1	-5.603	9.816	-.571	.568	
FxrateCS4	<---	F1	-.845	1.864	-.453	.650	
useforpaymnetIU1	<---	F2	1.000				
transfermoneyIU1	<---	F2	1.007	.301	3.344	***	
debtpaymentIU1	<---	F2	.655	.281	2.332	.020	
leverageIU1	<---	F2	.405	.296	1.369	.171	
use_reg_baseIU1	<---	F2	.589	.228	2.581	.010	
transferabroadIU1	<---	F2	.341	.197	1.729	.084	
curiosityIU1	<---	F2	-.179	.228	-.784	.433	
stayupdateIU1	<---	F2	.245	.279	.879	.380	
EntertainmentIU1	<---	F2	.147	.224	.659	.510	
InvestmentIU1	<---	F2	-.110	.227	-.486	.627	

Standardized Regression Weights: (Country Specific Issues - Default model)

			Estimate
F2	<---	F1	.221
famousinfluencersCS1	<---	F1	.084
InfCS2	<---	F1	-1.242
TaxCS3	<---	F1	-.645
FxrateCS4	<---	F1	-.104
useforpaymnetIU1	<---	F2	.812
transfermoneyIU1	<---	F2	.757
debtpaymentIU1	<---	F2	.508
leverageIU1	<---	F2	.301
use_reg_baseIU1	<---	F2	.561
transferabroadIU1	<---	F2	.378
curiosityIU1	<---	F2	-.173
stayupdateIU1	<---	F2	.194
EntertainmentIU1	<---	F2	.145
InvestmentIU1	<---	F2	-.107

Regression Weights: (Image of Cryptocurrencies - Default model)

			Estimate	S.E.	C.R.	P	Label
Intention	<---	Image	.527	.129	4.075	***	
smrt_pplIM1	<---	Image	1.000				
prestigeIM2	<---	Image	1.273	.143	8.873	***	
rep_in_peerIM3	<---	Image	.885	.111	7.998	***	
peer_wanttouseIM4	<---	Image	-.189	.195	-.967	.334	
useforpaymnetIU1	<---	Intention	1.000				
transfermoneyIU1	<---	Intention	1.053	.176	5.991	***	
debtpaymentIU1	<---	Intention	.796	.149	5.343	***	
leverageIU1	<---	Intention	.576	.217	2.659	.008	
use_reg_baseIU1	<---	Intention	.806	.214	3.770	***	
transferabroadIU1	<---	Intention	.465	.144	3.236	.001	
curiosityIU1	<---	Intention	-.252	.191	-1.318	.187	
stayupdateIU1	<---	Intention	.464	.190	2.438	.015	
EntertainmentIU1	<---	Intention	.249	.167	1.494	.135	
InvestmentIU1	<---	Intention	-.338	.128	-2.655	.008	

Standardized Regression Weights: (Image of Cryptocurrencies - Default model)

			Estimate
Intention	<---	Image	.528
smrt_pplIM1	<---	Image	.755
prestigeIM2	<---	Image	1.016
rep_in_peerIM3	<---	Image	.826
peer_wanttouseIM4	<---	Image	-.109
useforpaymnetIU1	<---	Intention	.789
transfermoneyIU1	<---	Intention	.742
debtpaymentIU1	<---	Intention	.656
leverageIU1	<---	Intention	.332
use_reg_baseIU1	<---	Intention	.467
transferabroadIU1	<---	Intention	.404
curiosityIU1	<---	Intention	-.166
stayupdateIU1	<---	Intention	.305
EntertainmentIU1	<---	Intention	.187
InvestmentIU1	<---	Intention	-.331

Regression Weights: (Perceived Ease of Use - Default model)

			Estimate	S.E.	C.R.	P	Label
F2	<---	F1	10.765	43.027	.250	.802	par_12
fearoflossPEoU1	<---	F1	1.000				
easytounderstandPEoU2	<---	F1	10.300	41.749	.247	.805	par_1
userfriendlyPEoU3	<---	F1	10.824	44.213	.245	.807	par_2
tensionofusePEoU4	<---	F1	8.958	35.705	.251	.802	par_3
useforpaymnetIU1	<---	F2	1.000				
transfermoneyIU1	<---	F2	1.138	.327	3.477	***	par_4
leverageIU1	<---	F2	.444	.321	1.382	.167	par_5
use_reg_baseIU1	<---	F2	.603	.248	2.430	.015	par_6
transferabroadIU1	<---	F2	.320	.222	1.440	.150	par_7
curiosityIU1	<---	F2	-.178	.256	-.693	.488	par_8
stayupdateIU1	<---	F2	.268	.310	.863	.388	par_9
EntertainmentIU1	<---	F2	.239	.252	.951	.342	par_10
InvestmentIU1	<---	F2	-.034	.255	-.135	.893	par_11
debtpaymentIU1	<---	F2	.829	.321	2.581	.010	par_13

Standardized Regression Weights: (Perceived Ease of Use - Default model)

			Estimate
F2	<---	F1	.779
fearoflossPEoU1	<---	F1	.059
easytounderstandPEoU2	<---	F1	.648
userfriendlyPEoU3	<---	F1	.805
tensionofusePEoU4	<---	F1	.547
useforpaymnetIU1	<---	F2	.748
transfermoneyIU1	<---	F2	.789
leverageIU1	<---	F2	.304
use_reg_baseIU1	<---	F2	.529
transferabroadIU1	<---	F2	.327
curiosityIU1	<---	F2	-.158
stayupdateIU1	<---	F2	.195
EntertainmentIU1	<---	F2	.218
InvestmentIU1	<---	F2	-.031
debtpaymentIU1	<---	F2	.592

Regression Weights: (Perception of Cryptocurrencies - Default model)

			Estimate	S.E.	C.R.	P	Label
F2	<---	F1	.523	.138	3.777	***	
Wise_to_invPoC1	<---	F1	1.000				
more_ppl_use_in_ftrPoC2	<---	F1	.571	.131	4.361	***	
big_innovPoC3	<---	F1	.829	.167	4.974	***	
extinctionPoC4	<---	F1	.070	.155	.453	.651	
useforpaymnetIU1	<---	F2	1.000				
transfermoneyIU1	<---	F2	1.169	.194	6.024	***	
debtpaymentIU1	<---	F2	.751	.161	4.676	***	
leverageIU1	<---	F2	.770	.229	3.358	***	
use_reg_baseIU1	<---	F2	1.037	.228	4.545	***	
transferabroadIU1	<---	F2	.480	.153	3.145	.002	
curiosityIU1	<---	F2	-.258	.201	-1.281	.200	
stayupdateIU1	<---	F2	.353	.201	1.752	.080	
EntertainmentIU1	<---	F2	.254	.175	1.450	.147	
InvestmentIU1	<---	F2	-.281	.135	-2.079	.038	
opp_diff_appPoC5	<---	F1	.281	.145	1.937	.053	
future_moneyPoC6	<---	F1	.239	.138	1.734	.083	

Standardized Regression Weights: (Perception of Cryptocurrencies - Default model)

			Estimate
F2	<---	F1	.621
Wise_to_invPoC1	<---	F1	.710
more_ppl_use_in_ftrPoC2	<---	F1	.605
big_innovPoC3	<---	F1	.772
extinctionPoC4	<---	F1	.059
useforpaymnetIU1	<---	F2	.751
transfermoneyIU1	<---	F2	.784
debtpaymentIU1	<---	F2	.589
leverageIU1	<---	F2	.422
use_reg_baseIU1	<---	F2	.572
transferabroadIU1	<---	F2	.398
curiosityIU1	<---	F2	-.161
stayupdateIU1	<---	F2	.220
EntertainmentIU1	<---	F2	.182
InvestmentIU1	<---	F2	-.261
opp_diff_appPoC5	<---	F1	.254
future_moneyPoC6	<---	F1	.226

Regression Weights: (Perceived Usefulness - Default model)

			Estimate	S.E.	C.R.	P	Label
F2	<---	F1	.722	.194	3.729	***	
More_FreedomPU1	<---	F1	1.000				
rel_securityPU2	<---	F1	.897	.230	3.901	***	
anonymityPU3	<---	F1	.249	.204	1.218	.223	
fast_transferPU4	<---	F1	1.139	.239	4.776	***	
useforpaymnetIU1	<---	F2	1.000				
transfermoneyIU1	<---	F2	1.249	.200	6.238	***	
debtpaymentIU1	<---	F2	.773	.163	4.753	***	
leverageIU1	<---	F2	.692	.232	2.981	.003	
use_reg_baseIU1	<---	F2	.967	.231	4.186	***	
transferabroadIU1	<---	F2	.533	.154	3.453	***	
curiosityIU1	<---	F2	-.264	.204	-1.298	.194	
stayupdateIU1	<---	F2	.376	.204	1.849	.064	
EntertainmentIU1	<---	F2	.257	.177	1.450	.147	
InvestmentIU1	<---	F2	-.260	.136	-1.908	.056	
makelife_easyPU5	<---	F1	1.321	.245	5.388	***	
rel_cheapPU6	<---	F1	1.316	.272	4.837	***	
rel_transparentPU7	<---	F1	.980	.221	4.429	***	
small_amountPU8	<---	F1	.755	.248	3.044	.002	

Standardized Regression Weights: (Perception Usefulness - Default model)

			Estimate
F2	<---	F1	.607
More_FreedomPU1	<---	F1	.628
rel_securityPU2	<---	F1	.526
anonymityPU3	<---	F1	.152
fast_transferPU4	<---	F1	.676
useforpaymnetIU1	<---	F2	.739
transfermoneyIU1	<---	F2	.824
debtpaymentIU1	<---	F2	.597
leverageIU1	<---	F2	.373
use_reg_baseIU1	<---	F2	.524
transferabroadIU1	<---	F2	.435
curiosityIU1	<---	F2	-.162
stayupdateIU1	<---	F2	.231
EntertainmentIU1	<---	F2	.181
InvestmentIU1	<---	F2	-.239
makelife_easyPU5	<---	F1	.810
rel_cheapPU6	<---	F1	.688
rel_transparentPU7	<---	F1	.616
small_amountPU8	<---	F1	.396

Regression Weights: (Perceived Risk- Default model)

			Estimate	S.E.	C.R.	P	Label
F2	<---	F1	-.198	1.046	-.189	.850	
vol_riskPR1	<---	F1	1.000				
ML_riskPR2	<---	F1	6.051	5.575	1.085	.278	
Idshare_riskPR3	<---	F1	6.372	5.895	1.081	.280	
Dec_riskPR4	<---	F1	8.215	7.554	1.088	.277	
Hack_riskPR5	<---	F1	4.037	3.779	1.068	.285	
useforpaymnetIU1	<---	F2	1.000				
transfermoneyIU1	<---	F2	1.150	.184	6.258	***	
debtpaymentIU1	<---	F2	.703	.149	4.713	***	
leverageIU1	<---	F2	.588	.216	2.717	.007	
use_reg_baseIU1	<---	F2	.868	.213	4.075	***	
transferabroadIU1	<---	F2	.488	.143	3.403	***	
curiosityIU1	<---	F2	-.234	.191	-1.222	.222	
stayupdateIU1	<---	F2	.366	.191	1.922	.055	
EntertainmentIU1	<---	F2	.208	.167	1.249	.212	
InvestmentIU1	<---	F2	-.284	.128	-2.224	.026	

Standardized Regression Weights: (Perceived Risk - Default model)

			Estimate
F2	<---	F1	-.028
vol_riskPR1	<---	F1	.145
ML_riskPR2	<---	F1	.679
Idshare_riskPR3	<---	F1	.613
Dec_riskPR4	<---	F1	.740
Hack_riskPR5	<---	F1	.509
useforpaymnetIU1	<---	F2	.789
transfermoneyIU1	<---	F2	.810
debtpaymentIU1	<---	F2	.579
leverageIU1	<---	F2	.339
use_reg_baseIU1	<---	F2	.503
transferabroadIU1	<---	F2	.425
curiosityIU1	<---	F2	-.153
stayupdateIU1	<---	F2	.241
EntertainmentIU1	<---	F2	.157
InvestmentIU1	<---	F2	-.278

D. TURKISH SUMMARY / TÜRKÇE ÖZET

Uzun yıllar boyunca birçok kişi tarafından merkezi olmayan para birimleri geliştirilmeye çalışmış ve bu girişimlerin kırılma noktası 2008'de Satoshi Nakamoto tarafından yayımlanan "Bitcoin: A Peer-to-Peer Electronic Cash System" isimli makale ile gerçekleşmiştir (Nakamoto, 2008). Makalede ilk merkeziyetsiz kripto para birimi olan Bitcoin'in arkasında yatan teknoloji anlatılmaktadır. İlk merkezi olmayan kripto para olan Bitcoin'in icadından bu yana, bireylerin ve kurumlar kripto paralara ilgi göstermektedirler. Kripto paralara ilgi arttıkça, kripto ekosistemi gelişmiş ve tüm dünyada ekonomik sistemi etkileyen büyük bir endüstri yaratmıştır. 2013 yılında sadece 67 kripto para dolaşımda iken bu çalışmanın yapıldığı sırasında kripto paraların sayısı 5000'in üzerine çıkmıştır. 2017 yılında kripto para birimlerinin toplam piyasa değeri 500 milyar ABD dolarının üzerine çıkmış, 2017'deki yükselişinden sonra, üç yıl boyunca dalgalı bir seyir izleyen piyasa değeri verisi 2020'ye kadar önceki zirve değerine ulaşamamıştır. 2020'den sonra kripto paralar yapılan yatırım miktarı tekrar artmaya başlamış ve kripto para birimlerinin toplam piyasa değeri 2 trilyon ABD dolarının üzerine çıkmıştır. Günümüzde ilk merkeziyetsiz kripto para olan Bitcoin, kripto para piyasasının %52,5'ine sahip olarak piyasayı domine etmektedir.

Kripto paralara ilgi arttıkça, kripto paralar ile ilgili işletmelere olan ihtiyaç da artmış ve finansal sistemlerdeki geleneksel mekanizmaları telafi eden mekanizmaların eksikliğini gidermek için çeşitli kripto para türleri ve kripto ile ilgili yeni iş modelleri ortaya çıkmıştır. Ethereum, kendi blok zinciri üzerinde çalışan bir yöntem ile "sabit kripto para" (stablecoins) oluşturmaya çalışmaktadır. Sabit kripto paralar değerlerini başka bir varlığa sabitleyerek fiyat oynaklıklarını dengelemeyi amaçlayan kripto paralardır. Fayda kripto paraları (utilty tokens) kripto paralar yatırım yapma imkânı sağlamayı hedeflemekte ve ilk dijital para arzı (ICO) ile çeşitli projelerin fonlanmasına yardımcı olmayı sağlamaktadırlar. Güvenlik kripto paraları (security tokens) geleneksel hisse senetlerinin eşdeğeri olarak kullanılmak için tasarlanmıştır ve insanlar bu kripto paraları satın aldıklarında bir şirketin belirli bir oranında ortağı

olmaktadırlar. Sosyal kripto paralar (social tokens) piyasa değerlerini spor kulüpleri ya da çeşitli markalara dayandırmakta ve bireylere beğendikleri topluluğu destekleme imkânı sağlamaktadırlar. Yönetim kripto paraları (governance tokens), hisse senetleri ile benzer bir yapıya sahip kripto paralardır ve bu kripto paralara sahip bireyler projelerin protokolüne ilişkin karar verme süreçlerinde yer alma hakkına sahiptirler. Borç kripto paraları (debt tokens) şirket tahvilleri ve uzun vadeli kredilerin alternatifi olmak için tasarlanmış kripto paralardır. Borç kripto paraları her ne kadar kendi kredi mekanizmalarını yaratmaya çalışsalar da bu mekanizma yüksek temerrüt riskli barındırmaktadır. Değiştirilemez kripto parlar (non fungible tokens-NFTs) Ethereum blok zincirini kullanarak farklı ürün türlerinin orijinalliğini kanıtlamak için tasarlanmıştır. Gizlilik kripto paraları (privacy tokens) yatırımcılarına daha fazla gizlilik sağlamayı ve bireylerin yaptıkları yatırımları diğer kişilerden gizlemesine olanak sağlamak için tasarlanmıştır. Borsa kripto paraları (excahnge tokens) kripto para borsaları tarafından kripto paraların daha fazla kişi tarafından benimsenmesini sağlamak amacıyla oluşturulmuştur. Merkez bankaları da merkez bankası dijital paralarını (Central Bank Digital Currencies-CBDC) ile kripto para alternatifi ürünler geliştirmiştir.

Kripto ekosistemi geliştikçe ve kripto paralarla ilgili birçok farklı iş modeli oluşturuldukça kripto paraların finansal sisteme olan etkileri de tartışılmaya başlamıştır. Literatürde kripto paraların finansal sisteme olan etkileri konusunda iki görüş bulunmaktadır. Bir görüş, kripto paralarla ilgili hack saldırıları ve kripto para borsalarına ilişkin güven riskleri nedeniyle kripto paraların finansal sistem üzerindeki potansiyel zararlı etkilerine dikkat çekmektedir. Diğer bir görüş ise kripto paraların, finansal sisteme benzersiz teknolojiler getirerek daha hızlı ve daha düşük maliyetli işlem yapma gibi kolaylıklar sağlamasından, finansal sisteme olan potansiyel faydalarına odaklanmaktadır.

Kripto paraların finansal sisteme yenilik getirmesi merkeziyetsiz yapılarından kaynaklanmakta ve akademik çalışmalar daha çok ilk merkeziyetsiz kripto para olan Bitcoin odaklı yapılmaktadır. Bitcoin'in oluşturulmasındaki amaçlarından biri de alternatif para birimi olmasını sağlamaktır ve Bitcoin’in bunu sağlaması itibari paraların tüm işlevlerini yerine getirmesine dayanmaktadır. Literatürde kripto

paraların itibari para fonksiyonlarını sağlayıp sağlaması konusunda bir fikir birliği bulunmamaktadır. Bazı akademisyenler kripto paraların, paranın değer saklama işlevini yerine getirdiğini iddia ederken, diğerleri ise sadece kripto paralar ile itibari paralar arasındaki benzerlikleri vurgulamaktadır. Kripto paraların itibari para fonksiyonlarını yerine getirip getiremediği konusunda bir fikir birliği olmasa da bu iki para birimi arasındaki ilişki ülkelerin para politikası hakkında egemen gücünü tehdit etmektedir. Kripto paralar merkezi olmayan bir yapıya sahip oldukları için itibari para olarak kabul edilmeleri durumunda finansal sistem için yüksek düzeyde risk oluşturmaktadır. Kripto paraların itibari para olarak kabul edilmesi durumunda, devletlerin para yaratma yeteneğini kaybedebilir ve devletin bu konudaki egemenliği ortadan kalkabilir. Olası egemenlik kaybı, ülkelerin bağımsız para politikası izleyememesi nedeniyle finansal sisteme zarar verebilir. Kripto paraların anonim yapısı, suçluların kripto paraları kullanarak yasa dışı faaliyetlerini yasal kurumlardan gizlemesini kolaylaştırmakta ve yasa dışı değeri nakde çevirmek için bir fırsat sağlamaktadır. Kripto paralar aracılığıyla yasa dışı faaliyetler için kullanılan para miktarı, tüm kripto paraların çok küçük bir bölümünü oluşturmaktadır. Oran olarak küçük olsa da yasa dışı faaliyetlerde kullanılan kripto para miktarı yüksek seviyelere ulaşabilmektedir. Para miktarının yanı sıra kripto paraların yasa dışı kullanımının varlığı da ülkelerin ekonomilerini etkilemektedir. Bireyler yatırımlarını kaybetmekte, bir miktar para kayıt dışı ekonomiye gitmekte ve terörün finansmanı ulus devletler için risk oluşturmaktadır. Bu tür etkiler nedeniyle düzenleyici otoriteler kripto paralarla ilgili düzenlemeler yapmış veya yasaklamıştır. Tablo E.1'de kripto paralarla ilgili düzenlemeler derlenmiştir.

Tablo E.1: Dünya Çapında Kripto Para Düzenlemeleri

ABD	• Yasal para birimi sayılmamakta • Kripto paraların ödeme yapma amacıyla kullanılması vergilendirmeye tabi olabilmekte
	• Yasal para birimi sayılmamakta • Mağazalarda ödeme aracı olarak kullanılabilen kripto paralar 2013 yılından itibaren vergiye tabi tutulmaktadır.

Kanada	• 2014 yılında kara para aklamayla mücadele (AML) için kripto para borsalarını düzenleyen ilk ülke.
Çin, Cezayir, Bangladeş vb.	• Çin'in kripto paralarla ilgili ilk kısıtlaması, 2017'de spekülatif Bitcoin ticaretinin %90'ını oluşturan yerel borsaları kapatmaktı. • 2019 yılında kripto paraların kullanılması tamamen yasaklandı. • 2021'de kripto paralarla ile ilgili her türlü işletme yasaklandı. • Çin ile birlikte Cezayir, Bangladeş, Mısır, Irak, Fas, Nepal, Katar ve Tunus kripto paraları yasaklayan ülkelerdir ve kripto paraları üstü kapalı olarak yasaklayan 42 ülke vardır.
AB	• Avrupa Birliği'nde (AB), kripto para birimleri yasa dışı olarak kabul edilmez. Kripto para birimleriyle ilgili vergilendirme üye devletler arasında farklılık gösterir, ancak üye devletlerin çoğu, kripto para kazançlarından 0 ile %0,5 arasında vergi tahsil etmektedir. • 2015 yılında kripto para ve itibari para birimi değişimi KDV'den muaf tutulmuştur. • 2020 yılında yasa dışı faaliyetler, özellikle kripto paralar kullanılarak kara para aklama işlemleri düzenlenmiştir. • Fransa, İtalya ve Almanya'da düzenleyici kurumlar, kripto para borsaları için kayıt zorunluluğu bulunmaktadır. • Birleşik Krallık'ta kripto para birimleri dört farklı türe ayrılır ve e-para ile güvenlik kripto paraları yasalarla düzenlenmiştir.
El Salvador	• El Salvador, 2021'de kripto paraları yasal para birimi olarak kabul eden ilk ülke olmuştur.
Venezüella	• Petro, hiperenflasyona karşı bir önlem olması amacıyla 2018 yılında oluşturulan dünyanın ilk devlet destekli kripto para birimidir.

Kaynak: Yazarın derlemesi

Devletlerin kripto paralara olan yaklaşımı değerlendirildiğinde kripto para birimlerinin devlet egemenliği için önemli bir sorun olarak görüldüğü sonucuna varılmaktadır. Ayrıca, uluslararası finansal sistemi korumak için uluslararası düzenlemeler oluşturmaya yönelik girişimler de bulunmaktadır. Farklı ülkelerde kripto para düzenlemeleri açısından farklılıkların bulunması ve geleneksel düzenleyici yaklaşımlar bağlamında düzenlemelerin oluşturulmasının karmaşıklığı nedeniyle, kripto para birimleri ile ilgili uluslararası düzeyde herhangi bir düzenleme bulunmamaktadır.

Kripto paralar dünya genelinde kullanılmaya başlandıkça, kripto paraların ülke ekonomilerine olan etkileri de artmış ve gelişmiş ve gelişmekte olan ülkeler için farklı etkilerin olduğu literatürde tartışılmıştır. Kripto para ekosisteminin merkezi olmayan yapısı nedeniyle, kripto para birimleri ile ilgili veriler gönüllülüğe dayanmaktadır ve bu durum standardizasyon ve güvenilirlik sorunlarına neden olmaktadır. Ancak, veriler "güvenilmez" olsa da analizlerin gerçekleştirilebilmesi için tek kaynak konumdadırlar ve ülke ekonomileri ile değerlendirildiğinde verilerle yapılan analizlerin tutarlı olduğu değerlendirilmektedir.

ABD toplam 27,4 milyon kullanıcı sayısı ile ülkeler arasında en yüksek kripto para kullanıcı payına sahiptir. ABD'yi sırasıyla 17,3 milyon, 13 milyon, 10,3 milyon ve 9 milyon toplam kullanıcı sayısı ile Rusya, Nijerya, Brezilya ve Pakistan takip etmektedir. Öte yandan ABD, ülkeler arasında en fazla kripto para kullanıcısına sahip olsa da toplam nüfusa oranı olarak kripto para kullanıcıları açısından ilk sırada yer almamaktadır. Ukrayna %12,73 oran ile nüfusun yüzdesi olarak en fazla kripto para kullanıcısına sahip ülke konumunda yer almaktadır. Ukrayna'yı sırasıyla %11,91, %10,34, %8,52 ve %8,31 ile Rusya, Venezuela, Kenya ve ABD izlemektedir. Bireysel yatırımcılar, dünyadaki kripto para yatırımcılarının çoğunu oluşturmaktadır. Ortalama olarak, yatırımcıların %73'ü bireysel, %21,2'si ticari ve kurumsal müşterilerdir ve yatırımcıların %5,8'i tanınmamaktadır. Bireysel yatırımcılar Latin Amerika, Asya Pasifik ve Orta Doğu'da nispeten yüksektir. Gelişmiş ülkelerin çoğu Avrupa ve Kuzey Amerika'da olduğu için büyük kurumların gelişmekte olan ülkelere göre kripto paralara daha fazla ilgi gösterdiği ve gelişmiş ülkelere daha fazla yatırım yaptığı anlaşılmaktadır. Kripto ekosistemi geliştikçe kripto paraların ülke ekonomilerine olan

etikleri de artmaktadır. Yukarıda bahsedildiği gibi kripto paralarla ilgili gelişmeler farklı ülke gruplarında farklı düzeyde gerçekleşmiştir. Kripto paraların ülkeler ekonomilerine olan etkileri de farklı ülke gruplarında farklı düzeyde geçekleşmektedir.

Tablo E.2: Kripto Paraların Potansiyel Risk ve Faydaları

Potansiyel Faydalar	**Potansiyel Riskler**
Kurumsal organizasyon eksikliğinin telafisini sağlama	Finansal istikrar riski
Finansal entegrasyonda artış	Siber güvenlik riski
Kurumsal yolsuzluğun azaltılması	Operasyonel risk
İşlem maliyetlerinin düşürülmesi	Piyasa bütünlüğü riski
Üçüncü taraf kurumların önüne geçerek şeffaflık ve hesap verebilirliğin sağlanması	Yönetimsel riskler
Gelişmekte olan ülkeler için yetişme sürecine katkıda bulunma	Hack ve dolandırıcılık riski
Mikro kredi ve sigorta sağlama	Kriptotolaşma (cryptoization) riski
Finansal sisteme dahil olmada artış	

Kaynak: Yazarın derlemesi

Bu tür riskler ve faydalar farklı ülkelerde farklı derecelerde ortaya çıkmaktadır. Risk ve faydaların ekonomi üzerindeki etki düzeyi, potansiyel etki alanı tarafından belirlenmektedir. Kripto para birimlerinin ülke ekonomileri üzerindeki potansiyel etkisi, temel olarak kripto para birimleri ile ilgili düzenlemelerin düzeyi değişmektedir. Düzenleyici kuruluşlar kripto para birimleriyle ilgili tüm faaliyetleri yasaklarsa, ekonomi üzerindeki potansiyel etkilerinin çoğu gerçekleşmez. Düzenlemelerin düzeyi ile, her ülkeye özgü ekonomik dinamikler etki düzeyini değiştirmektedir. Gelişmekte olan ülkelerde makroekonomik istikrarın daha düşük olması ve güçlü finansal kurumların eksikliği, gelişmiş ve gelişmekte olan ülkeler arasında önemli bir fark oluşturmaktadır. Gelişmiş ülkelerde, makroekonomik istikrarın daha yüksek olması ve güçlü finansal kurumların varlığı kripto para birimlerinin ülke ekonomileri üzerindeki potansiyel etkilerine daha az alan

bırakmaktır. Gelişmiş ülkelerdeki güçlü ekonomik yapı bireylerin kripto paraya olan ilgisini azaltıcı yönde etkilemektedir. Yüksek düzeyde işsizlik, yüksek enflasyon ve para biriminin değer kaybetmesi, gelişmekte olan ülkelerde kripto para birimlerine daha fazla ilgi gösterilmesine neden olmaktadır. Gelişmekte olan ülkelerde, insanlar tasarruflarını korumak ve geleneksel yatırımlardan çok daha fazla kar elde etmek için kripto para birimlerine alternatif bir araç olarak yaklaşmaktadır. Kripto paraların ülke ekonomilerine olan etki düzeyini belirleyen bir diğer önemli parametre ise kripto para birimlerinin benimsenme düzeyindeki farklılıktır. Gelişmiş ve gelişmekte olan ülke ekonomilerinin kripto paralardan etkilenme düzeyini belirleyen en önemli faktör, insanlar tarafından kripto paraların benimsenme seviyesindeki farklılıktır.

Kripto paralar hem gelişmiş hem de gelişmekte olan ülkelerde genellikle yatırım yapmak için kullanılır. Paranın tüm işlevlerini yerine getirememeleri, onların bir yatırım aracı olarak kullanmalarının ana nedenidir. Genel kullanım amacının yanında, kripto paraların kullanımı açısından gelişmiş ve gelişmekte olan ülkeler arasında bazı kullanım farklılıkları bulunmaktadır. Gelişmekte olan ülkelerde kripto paraların kullanım çeşitliliği gelişmekte olan ülkelere kıyasla daha fazladır. Mülkiyet hakkı hizmeti almak, mikro kredi almak ve internet ve elektrik altyapısını geliştirmek için kripto paraların kullanılması Afrika Kıtası'ndaki ülkelerde daha yaygındır. Afrika Kıtası dışındaki gelişmekte olan ülkeler arasındaki kullanım farklılıkları daha az görülse de gıda ve sigorta takibi için bir araç kripto paraların kullanılması diğer farklı kullanımlara örnek olarak gösterilebilir. Öte yandan gelişmiş ülkelerde kripto paraların kullanımı bir yatırım aracı olma üzerine yoğunlaşmıştır. Bu tür kullanım farklılıklarının oluşmasında banka şubelerinin sayısındaki yeterlilik, güvenilen kurumların varlığı, mülkiyet haklarının onaylanmasına yönelik hizmetlerin yeterli düzeyde sağlanmış olması vb. gibi bazı temel kalkınma göstergelerine gelişmiş ülkelerin halihazırda ulaşmış olması ancak, bazı gelişmekte olan ülkelerin halen bu temel ihtiyaçlardan yoksun olması büyük etki sahibidir. Kripto para birimlerinin belirli zararlı etkileri hem gelişmiş hem de gelişmekte olan ülkeler için önemli bir tehdit oluşturmaktadır. Özellikle sabit sabit kripto palaların oluşturduğu riskler ve hack olayları her iki ülke grubunu da etkilemektedir. Kripto paraların gelişmekte olan ülkeleri daha fazla etkilemesinin negatif yönleri değerlendirildiğinde, kripto para birimlerinin itibari para birimleri ile ikame edilmesi nedeniyle merkez bankalarının

ekonomiyi etkileme yeteneğini kaybetmesi olası en zararlı sonuç olarak görülmektedir.

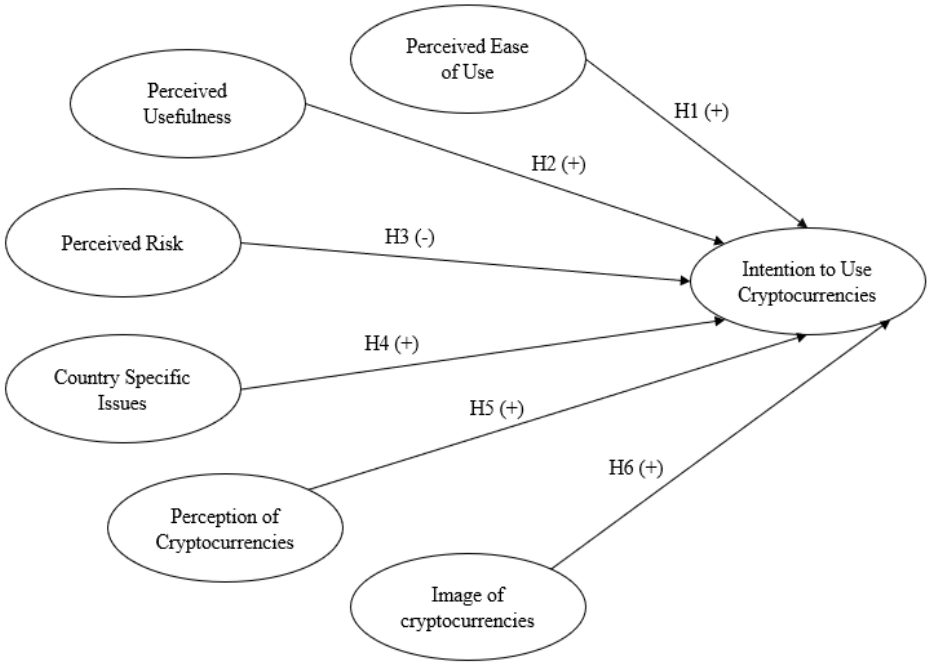
Türkiye, kripto para birimlerinin ilgi gösterildiği önemli ülkelerden biridir. Türkiye'de kripto para birimlerinin gelişimi diğer gelişmekte olan ülkelere benzer şekilde ilerlemiştir ve Türkiye kripto paralara ilgi gösterme açısından "geç kalan" ülkelerden biridir. Türkiye'de kripto paralara temel ilgi 2021 yılında gerçekleşmiştir. Türkiye'de seçilen kripto para borsalarına dayalı günlük kripto para kullanıcıları incelendiğinde kripto paralara olan ilginin ilk artışını 2017'nin sonunda yaptığı görülmektedir. Bu artış, 2017'de bitcoin ve diğer kripto para birimlerinin artan popülaritesi ile ilgilidir. 2021'de meydana gelen ikinci artışta ise Covid-19 salgının ülke ekonomilerine olan negatif etkisi ve bireylerin tasarruflarını değerlendirmek için alternatif araçlara ilgi göstermesinin etkili olduğu değerlendirilmektedir.

2021 yılından itibaren Türkiye'de kripto para birimlerine artan ilgi nedeniyle birlikte, düzenleyici kurumlar kripto paraların ekonomi üzerinde oluşturabileceği olası negatif etkileri önlemek için bir dizi düzenleme yapmışlardır. 2013 yılında elektronik paralarla ilgili yapılan düzenleme yeni çeşit para birimleri ile ilgili düzenlemelerin ilk adımını oluşturmuştur. Daha sonta yapılan düzenlemelerde kripto paraların fiyatlarındaki oynaklık, dijital cüzdanların çalınması, servis sağlayıcılarla ilgili operasyonel risklere vurgu yapılmış ve merkez bankası dijital para biriminin çıkartılması değerlendirilmiştir. Kripto paralarla ilgili önemli sayılabilecek düzenlemeler Türkiye'de yer alan kripto para borsalarından Thodex'in işlem yapmayı bırakması ve yaklaşık olarak 2 milyar dolar değerinde kripto paranın çalınması sonrasında yapılmıştır. 2021 yılında kripto paralarla ödeme yapılması yasaklanmıştır. Ayrıca kripto para sağlayıcılara kullanıcıların kimlik bilgileri istendiğinde bilgi verme zorunluluğu getirilmiştir. Kripto paraların Türkiye'deki gelişimi değerlendirildiğinde hem kullanıcı tarafında hem de düzenleyici kurumlar tarafında son yıllarda oldukça fazla önem arz ettiği görülmektedir.

Bu çalışmanın temel amacı Türkiye'de kripto para birimlerinin benimsenmesinin altında yatan faktörleri belirlemektir. Literatür incelendiğinde Türkiye'de kripto para birimlerinin benimsenmesi ile ilgili gazete haberleri, raporlar ve sınırlı sayıda

akademik araştırma bulunduğu görülmüş ve kapsamlı bir analiz gerçekleştirilerek literatüre katkıda bulunulması amaçlanmıştır.

Kapsamlı bir çalışma yapmak ve ilgili literatüre katkı sağlamak için hem röportaja dayalı hem de ankete dayalı analizler yapılmıştır. Anket ve mülakat soruları, dünya çapında kripto para biriminin benimsenmesine ilişkin akademik analizlere dayalı olarak hazırlanmıştır. Sorular oluşturulurken röportaj ve anket soruları oluşturulmasına yönelik olarak hazırlanmış akademik rehberler incelenmiş, akademisyenlerden görüş alınmış ve ODTÜ uygulamalı Etik Araştırma Merkezi'nden onay alınmıştır. Derinlemesine analiz yapabilmek için anket sorularını oluşturmak üzere beş kişi ile standartlaştırılmış açık uçlu görüşmeler yapılmıştır. Görüşülen kişiler, anket sorularını oluştururken daha güvenilir bilgiler elde etmek için Türkiye'deki kripto para birimi kullanıcılarının farklılıkları göz önüne alınarak farklı profildeki kişilerden seçilmiştir. Bu çalışmada kripto paraları kullanmaya devam eden bireyler, kripto paraları kullanmış ancak kullanmayı bırakmış kişiler ve kripto paraları hiç kullanmamış kişiler olmak üzere üç farklı grup incelenerek literatüre katkı sağlanması hedeflenmiştir. Kripto paraları deneyimleyen kişilerden elde edilecek verileri analiz etmek için temel model olarak teknoloji kabul modeli 'ne (TAM) seçilmiş ve orijinal model bu çalışmada kullanılmak üzere modifiye edilmiştir. Orijinal modelde olmayan ülkeye özgü durumlar, algılanan risk, kripto para algısı ve kripto paraların imajı olmak üzere dört farklı değişken modele eklenmiş ve altı adet hipotez oluşturulmuştur. Oluşturulan model figür E.1'de gösterilmiştir.



Figür E.1: Araştırma Modeli ve Hipotezeler

Hipotez 1 (H_1): Algılanan kullanım kolaylığı ile kripto para kullanma niyeti arasında pozitif bir ilişki vardır.

Hipotez 2 (H_2): Algılanan fayda ile kripto para kullanma niyeti arasında pozitif bir ilişki vardır.

Hipotez 3 (H_3): Algılanan risk ile kripto para kullanma niyeti arasında negatif bir ilişki vardır.

Hipotez 4 (H_4): Ülkeye özgü durumlar ile kripto para kullanma niyeti arasında pozitif bir ilişki vardır.

Hipotez 5 (H_5): Kripto para algısı ile kripto para kullanma niyeti arasında pozitif bir ilişki vardır.

Hipotez 6 (H_6): Kripto paraların imajı ile kripto para kullanma niyeti arasında pozitif bir ilişki vardır.

Çalışmada yer alan katılımcılar halka açık yerler, üniversiteler ve kurumlar gibi alanlardan seçilerek örneklemin çeşitlendirilmesi amaçlanmıştır. Veri toplama işlemi

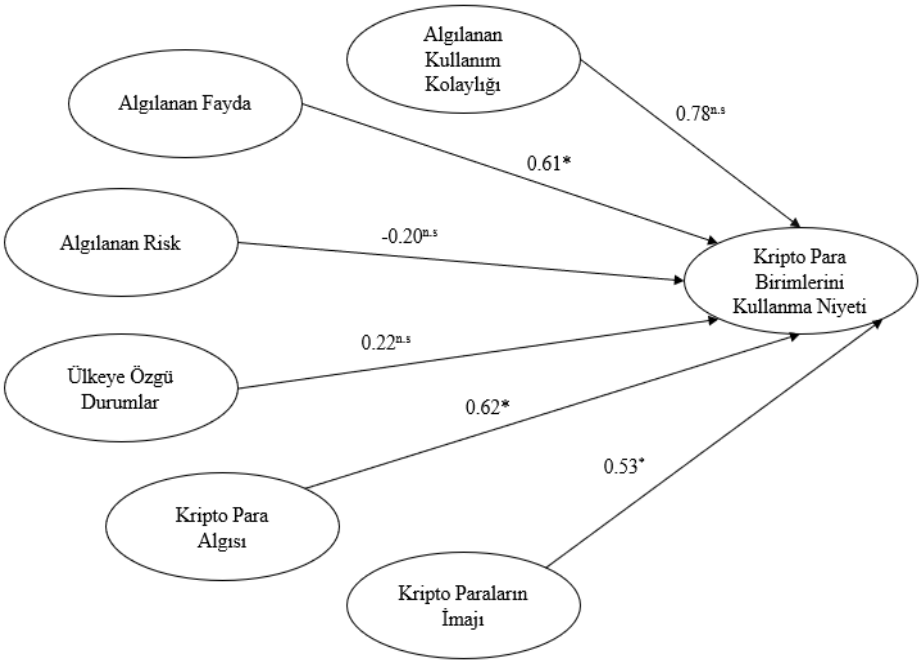
sonucunda toplam 130 katılımcıdan veri elde edilmiştir. Örneklemde yer alan yetmiş yedi kripto para kullanmıştır. Kripto para kullanan kişilerden kırk üç kişi kripto para kullanmayı bırakırken, otuz dört kişi bu çalışma sırasında kripto para kullanmaya devam ettiğini belirtmiştir. Katılımcılardan elli üç kişi ise daha önce hiç kripto para kullanmadığını ifade etmiştir.

Çalışmada yer alan katılımcıların demografik özellikleri incelendiğinde %34,5'inin kadın ve %64,6'sının ise erken olduğu gözlemlenmiştir. Katılımcıların %36,2'si 18-24 yaş arasında, %28,5'i 25-30 yaş arasında, %14,6'sı 31-40 yaş arasında ve %20,8'i 40 yaş üzeridir. Katılımcıların %33,1'i lise mezunu, %10'u yüksek okul mezunu, %50'si lisans mezunu, %4,6'sı yüksek lisans mezunu ve %2,3'ü doktora derecesine sahiptir. Katılımcıların çoğunluğunu lisans mezunu genç erkekler oluşturmaktadır.

Kripto para deneyimleyen kullanıcıların verileri incelendiğinde Katılımcıların %83,1'inin kripto paraları arkadaşlarından öğrendiği, %70,1'inin kripto paralar hakkındaki bilgi düzeylerinin ne çok iyi ne de çok kötü olduğunu belirttiği, %87'sinin kripto para yatırımı için kripto para borsalarını kullandığı, %71,4'ünün kripto para yatırımlarını son üç yıl içinde yaptığı ve %89,6'sının ağırlıklı olarak 2021 yılında kripto paralara yatırım yaptıkları gözlemlenmiştir. Kullanıcıların %24,4'ü BTC, %23,8'i DOGE, %22,3'ü SHIB ve %10,2'si ETH kullanmıştır. Örneklemdeki kripto para kullanıcılarının %72,7'si diğer yatırım seçeneği olarak döviz ve altını tercih ettiklerini belirtmiştir. Kullanıcıların %31,2'si 1001-5000 TL arasında kazan elde ettiğini ve %42,9'u 1001-5000 TL arasında zarar elde ettiğini belirtmiştir. Kullanıcıların %45,5'i kripto para yatırımındaki genel pozisyonlarını kârlı olarak belirtmiş, %45,5'i kripto para yatırımındaki genel pozisyonlarını zarar olarak belirtmiş ve %9,1'i ise ne zarar ettiklerini ne de kar elde etmediklerini belirtmiştir.

Türkiye'de kripto para biriminin benimsenmesini etkileyebilecek ülkeye özgü koşulları anlamak için dört soru sorulmuştur. Kullanıcıların %52'si ünlü influencerların fikirlerinin kripto para kullanımını etkilediği konusunda kesinlikle hemfikir olduğunu ifade etmiştir. Kullanıcıların %59,7'si yüksek enflasyon seviyesinin kripto para kullanımını artırdığına kesinlikle katıldığını belirtmiş, %24,7'si Türkiye'de kripto para yatırımlarında vergi uygulamasının olmamasının kripto para kullanımını artırdığını ifade etmiş ve %59,7'si döviz kurundaki yüksek

oynaklığın kripto para kullanımını artırdığına kesinlikle katıldığını belirtmiştir. Kullanıcıların %55,8'i yatırım yapmayı kripto paralara yatırım yapmayı bıraktığını, %44,2'si ise kripto paralara yatırım yapmaya devam ettiğini ifade etmiştir.



*Tahmin değeri %95 güven aralığında anlamdır; n.s. anlamlı değildir

Modifiye edilmiş modele girilen altı kısıttan üçünün kripto para kullanma niyeti üzerinde istatistiksel olarak anlamlı bir etkisi olduğu sonucuna ulaşılmıştır. Algılanan fayda ($\beta=0.61$; $p<0.05$), kripto para algısı ($\beta=0.62$; $p<0.05$) ve kripto paraların imajı ($\beta=0.53$; $p<0.05$.)

Kripto para kullanmayı bırakan kullanıcıların neden bıraktıklarını incelemek için yedi tane sorul oluşturulmuştur. Kullanıcıların kripto para yatırımı yapmayı bırakmasında en önemli neden olarak kripto para yatımından kaynaklanan para kaybının en önemli etmen olduğu sonucuna ulaşılmıştır. Ayrıca kripto paraların fiyat seviyesindeki oynaklık, kripto paralarla ilgili düzenlemelerin yetersizliği ve kripto paraların çalınması gibi unsurların da etkili olduğu sonucuna ulaşılmıştır. Kripto para yatırımı yapmayı bırakan kullanıcılar, kripto para fiyatlarının daha stabil olması ve kripto paralara yatırım yapmanın daha güvenli olması durumunda tekrar kripto para yatırımı yapabileceklerini belirtmişlerdir.

Daha önce hiç kripto para yatırımı yapmamış katılımcıların verileri incelendiğinde kripto paralarla ilgili bilgi düzeylerindeki yetersizlik, kripto paralara yatırım yapan arkadaşlarının para kaybetmiş olması ve kripto paraların çok risk içeren yatırım aracı olmasının daha önce hiç kripto para yapmamalarında en etkili olan nedenler olduğu sonucuna ulaşılmıştır. Ayrıca, kripto paraların fiyatlarındaki oynaklık ve kripto paralarla ilgili siber risklerin de daha önce hiç kripto para yatırımı yapmamalarında etkili olduğu belirtilmiştir. Daha önce hiç kripto para yatırımı yapmamış kişilerin çoğunluğu, kripto paralarla ilgili bilgi düzeylerinin artması ve kripto paraların daha fazla düzenlenme yapılması durumunda kripto paralara yatırım yapabileceklerini belirtmişlerdir. Kripto para yatırımını bırakmış ve hiç yapmamış kişilerin kripto paralara yatırım yapma konusunda beklentileri değerlendirildiğinde, Türkiye'de kripto para piyasasının daha fazla düzenlenmesinin finansal katılımı artırabileceği ve düzenleyici otoritelerin para ve maliye politikalarında kontrol seviyesinin yükselebileceği değerlendirilmektedir.

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