

Czech University of Life Sciences
Faculty of Economics and Management
Department of Economics



Master's Thesis

The adaptation of decentralized finance (Case study:
decentralized finance among Prague University
Students)

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DIPLOMA THESIS ASSIGNMENT

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Economics and Management

Economics and Management

Thesis title

The adaptation of decentralized finance (Case study: decentralized finance among Prague University Students)

Objectives of thesis

The objective of this thesis is to find out the adaptation level that university students have on the topic of decentralized finance. And whether they find good potential in it in the future. This research will help find out whether the adaptation of decentralized finance has already started for university students in Prague. And what are the aspects they believe make decentralized finance a good or a bad invention? This research will help us know the stance of university students in Prague about decentralized finance, and the general awareness about decentralized finance amongst university students in Prague. This will help readers of research know where the future might go, and what are the possibilities of decentralized finance emerging in the future. It will also help understand what may be missing to improve the general trust in decentralized finance

Methodology

The literature review will be developed through online research through relevant sources that publish financial and blockchain news such as Forbes, Ethereum, MarketWatch, and Bloomberg. While data gathered about Prague student awareness and attitude towards decentralized finance will be gathered through questionnaires and semi-structured interviews. Questionnaires will be used because they allow gathering a large amount of data in a short period of time which we can analyze quantitatively, and semi-structured interviews help gather information about a specific subject while also allowing the person being interviewed to add more information if they feel can be relevant for the research, this will help add more qualitative data to the research and more personal insight to the project.

The proposed extent of the thesis

40-60 pages

Keywords

Decentralized finance, traditional finance, banking.

Recommended information sources

1. Sandner, P. (2021). Decentralized Finance Will Change Your Understanding Of Financial Systems. [online] Forbes. Available at: <https://www.forbes.com/sites/philippandner/2021/02/22/decentralized-finance-will-change-your-understanding-of-financial-systems/?sh=78df25235b52> [Accessed 26 Jun. 2021].
2. Lemmens, P. (2021). The coming wave of disruption: from bitcoin to decentralized finance. [online] Pure play asset management | Robeco.com. Available at: <https://www.robeco.com/en/insights/2021/04/the-coming-wave-of-disruption-from-bitcoin-to-decentralized-finance.html> [Accessed 28 Jun. 2021].
3. Ethereum (n.d.). Decentralized finance (DeFi). [online] ethereum.org. Available at: <https://ethereum.org/en/defi/>.
4. Meegan, X. and Koens Ing, T. (n.d.). Lessons Learned from Decentralised Finance (DeFi). [online] . Available at: https://new.ingwb.com/binaries/content/assets/insights/themes/distributed-ledger-technology/defi_white_paper_v2.0.pdf.
5. Grigo, J., Hansen, P., Patz, A. and Wachter, V. (2020). Decentralized Finance (DeFi) – A new Fintech Revolution? [online] . Available at: https://www.bitkom.org/sites/default/files/2020-07/200729_whitepaper_decentralized-finance.pdf.

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Declaration

I declare that I have worked on my thesis “The adaptation of decentralized finance (Case study: decentralized finance among Prague University Students)” By myself. And all the sources used in this thesis are referenced and sources listed in the reference table. As the Author of this thesis, I declare that the thesis does not break any copyrights.

In Prague on 30/11/2022

Marwan Ibrahim

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The adaptation of decentralized finance (Case study: decentralized finance among Prague University Students)

Abstract

This research project is created to analyze and investigate the level of adaptation of decentralized finance among university students in Prague. The Idea of the research originated because the current level of investments and market capital of decentralized finance is increasing day by day. With more users joining the decentralized finance sector, it is still not clear why there is such an increased number of decentralized finance investments and users and whether there is potential for decentralized finance to substitute traditional finance. So, the researcher decided to investigate whether university students in Prague universities are using decentralized finance, and if yes, what are they using it for. The data in the research was gathered through a literature review, and feedback from Prague students was gathered through questionnaires given out to students both online and in person. After conducting a detailed literature review about decentralized finance and collecting questionnaire feedback for over 120 university students in Prague, Czech Republic. The findings are that the majority of university students in Prague, over 81% percent know what decentralized finance is. And 46.2% of the university students in Prague did have a decentralized finance transaction in the past 2 years. 57% percent of the students in Prague use it as a form of investment rather than a currency for exchanging goods. Lastly, over 75% percent of university students in Prague believes that using decentralized finance as a form of investment, and conducting financial transactions will increase in the upcoming years. The findings from the literature review strongly suggested that people tend to use decentralized finance when they cannot rely on or trust their country's traditional financial system. So decentralized finance does not fully replace traditional finance but acts as a potential substitute for traditional financial systems if it is not functioning well or there are issues with the traditional financial system. Which explains the reason why decentralized finance is only utilized as a form of investment in the Czech Republic and not as legal tender. As the local Czech Financial system is functioning well.

Keywords; Decentralized, Finance, Blockchain, University, Students, Adoption, Prague.

Adaptace decentralizovaných financí (subjekt výzkumu: Decentralizované finance mezi studenty pražských univerzit)

Abstraktní

Tento výzkumný projekt byl vytvořen, aby analyzoval a zkoumal úroveň adaptace decentralizovaných financí mezi studenty pražských univerzit. Motivace tohoto výzkumu vyplývá z momentální výše investic, a tržního kapitálu decentralizovaných financí, které rostou každým dnem. S více uživateli připojujících se do sektoru decentralizovaných financí, stále není jasné proč počet investic a uživatelů decentralizovaných financí stále roste, a pokud mají decentralizované finance potenciál nahradit finance tradiční. Proto se výzkumník rozhodl vystudovat, zda studenti pražských univerzit využívají decentralizované finance a pokud ano, na co je používají. Údaje v tomto výzkumu byly shromážděny z posudků literatury a skrz zpětnou vazbu pražských studentů, shromážděné v dotaznících, které byly studentům vydávány jak online tak i osobně. Po sestavení detailního literárního posudku o decentralizovaných financí a shromáždění zpětné vazby z dotazníků od více jak 120ti studentů pražských univerzit v České Republice. Výsledkem je, že většina studentů pražských univerzit, přes 81%, ví co jsou to decentralizované finance. A 46.2% studentů pražských univerzit provedli transakci v decentralizovaných financích za poslední dva roky. 57% studentů v Praze je používá spíše formou investice, než jako měnu na nákup zboží. Nakonec přes 75% studentů pražských univerzit věří, že využití decentralizovaných financí jako formy investice, a vytváření finančních transakcí se v budoucích letech zvýší. Výzkum literárních posudků silně naznačil, že lidé mají sklon k využití decentralizovaných financí v případech, že se nemohou spolehnout, nebo důvěřovat tradičnímu státnímu finančnímu systému. Což vysvětluje důvod, proč jsou v České Republice decentralizované finance pouze využívány formou investic, místo legálního platidla. Jelikož lokální český finanční systém funguje dobře.

Klíčová slova: Decentralizované, finance, blockchain, studenti, univerzit, adaptace, Praha.

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1. Introduction

The Economic world is highly connected and full of competition between countries and organizations. While that is a positive aspect from the economic point of view. Many families' livelihood and lifelong earnings are deeply connected to their country's economic and financial system management. Positive country economic management is very crucial to the stability of population of this country. And as it can be seen from many economic scenarios that happened in recent years, the depreciation of Venezuelan currency, Lebanese liquidity crisis and Turkish currency crisis. The financial system may not always be perfect, or protective of its users. There have been many scenarios of governments making mistakes and damage the country's financial system in process, leaving many of the population in economic collapse and endanger their livelihood (Reuters, 2021). This has severe impact on the livelihood of many families. Who are not actively engaged and following up with the recent updates and news of the financial sector and central banks. For example, the Lebanese pound have lost 90% of its value in late 2019. Pushing the country to a financial crisis due to governmental incompetence and leadership flaws (Sabaghi, 2022). Lebanon's GDP decreased from 55 billion in 2018 to 20.5 billion in 2021 according to the world bank (Reuters, 2022). People often store their life savings in their country's currency, and if the country management is not competent enough. Population of that country may lose value of all their savings due to the mistakes their country's leadership or central bank leadership decisions. And These issues are not always the fault of the average citizen. But it would put the safety and livelihood of average citizen life and future at huge risk. And that is because the average citizen has no control or overseeing ability of what is happening inside the central bank or other financial institutions in the country. Central bank information can sometimes be very centralized and not shared quickly with other stakeholders outside of the central bank. Countries that once faced huge financial burdens because of their central banks are Lebanon, Venezuela, Sri Lanka, and many other countries (Stevens, 2022). These countries woke up one day to realize all their savings, cash, liquidity is losing its value day by day. Simply because their central banks made mistakes, kept information for themselves, and hidden data from the rest of the population.

Due to financial crises presented above, people have decided to create an alternative financial system that can provide solution to the current centralized financial system, where it operates in a decentralized environment where no central group of people can have full control and ownership of managing the monetary system. By eliminating middlemen and banks, People

can now use peer to peer network and leverage the technological advances achieved to use conduct financial transactions through decentralized finance. Decentralized financial system sometimes called “DeFi” is an operating financial system where computers from all around the world are connected and everyone connected to the decentralized finance network can monitor transactions, liquidity, transaction fees, wallet holders and other financial information. Whenever there is internet, the decentralized finance can lend, borrow, buy, sell, and hold electronic money. Decentralized finance eliminates the need of having banks to hold our savings, or to process transactions for us. And with the use of technology, this makes the cost of transactions and holding money much cheaper. This helped create a parallel economy in which now people can also store their money as crypto currency on online networks. Decreasing the risk of having the government control their money and increasing the sense of ownership to people with their money.

With such financial crises happening, this pushed people to try to find a new solution to the current financial system. A solution to the current financial system where the average citizens can have more power and overview of the financial system, can make their own decision without the need of confirmation or accessibility from the central bank or local government. For example, the people of Lebanon are now unable to withdraw their money from their banks. Even though this money belongs to them, but due to the mismanagement from higher level leadership of the country’s funds, the country’s central bank lost its liquidity reserves and is now unable to pay back the people their money. While higher level leadership in the government were able to withdraw all their funds months before the crisis has happened. The country’s leadership staff was aware of the liquidity issue happening in the Lebanese central bank and were able to withdraw their savings and transfer it to foreign accounts abroad, so they save their funds before the Lebanon economy collapsed. While the average Lebanese citizen was not able to oversee such information or forecast. And failed to protect himself from such economic collapse, because the information about the potential financial sector collapse was hidden from the public for a long time by the Lebanese government.

The process of eliminating such problem as low access to financial information can be resolved by decentralized finance, simply because all the users engaging in the decentralized finance have access to the public ledger and would have been able to spot the large sums of money being withdrawn by officials in the central bank and the local government. Which would raise suspicion for the public to withdraw their funds as well. Reducing the damage that has impacted the Lebanese population in 2021. The Lebanese citizen is now unable to withdraw their savings

because there are currently no reserves available at the Lebanese banks for people to withdraw money. And the central bank halted withdrawals for all the local citizens. The Lebanese population now have many different choices to make, either to depend on their country's financial system, which is struggling from fraud and mismanagement for years, start from zero and create a new financial system. Or rely on decentralized finance as a contingency financial system until the country gets the support it needs for the world bank.

As it can be seen from the issues presented above, centralized finance has drastic fallout damage to the populations using it. And by the market capital of decentralized finance increasing drastically, this has raised the curiosity of the researcher in this research to try to analyze and investigate the level of adaptation of decentralized finance among university students in Prague, Czech Republic. As this would show how much people understand from decentralized finance, how often they use it, and what they believe is its advantages/disadvantages.

2. Aim, Objectives, and research questions

2.1. Aim

To research the adaptation level of decentralized finance among university students in Prague.

2.2. Objectives

- To research about Decentralized finance, their advantages, and disadvantages. And why they are continuously growing in the means of market cap and public interest.
- To gather data about the awareness and understanding of Decentralized finance among university students in Prague.
- To gather data about the percentage of university students that are currently engaging in decentralized finance.
- To Gather data about whether university students are still interested to invest in Decentralized finance technology in the future.
- Draw conclusions on the level of awareness and interest of blockchain investments amongst university students in Prague.

2.3. Research questions

<ul style="list-style-type: none"> To research about Decentralized finance, their advantages, and disadvantages. And why they are continuously growing in the means of market cap and Active users. 	<ol style="list-style-type: none"> 1. What is decentralized finance technology? 2. What are the advantages of decentralized finance technology? 3. What are the disadvantages of decentralized finance technology? 4. Why is the decentralized finance market cap increasing recently?
<ul style="list-style-type: none"> To gather data about the awareness and understanding of blockchain investments amongst university students in Prague. 	<ol style="list-style-type: none"> 1. How aware are university students in Prague about blockchain investments and decentralized finance? 2. Do university students in Czech Republic understand the concepts of decentralized finance? 3. Do university students in Prague find potential in decentralized finance? 4. What is the main usage of decentralized finance among university students in Prague?
<ul style="list-style-type: none"> To gather data about the percentage of university students that are currently engaged in decentralized finance. 	<ol style="list-style-type: none"> 1. Do university students in Czech Republic use decentralized finance? 2. How much is the percentage of university students that understand decentralized finance? 3. Is the interest for decentralized finance increasing or decreasing?

	<ol style="list-style-type: none"> 4. What are the percentage of income that university students invest in decentralized finance?
<ul style="list-style-type: none"> • To Gather data about whether university students are still interested to invest in blockchain technology in the future. 	<ol style="list-style-type: none"> 1. Do students in Czech University find potential in Decentralized finance? 2. Does University students in the Czech Republic think the trend of using decentralized finance will increase? 3. Does University students in the Czech Republic think the trend of using decentralized finance will Decrease? 4. What does the University students in the Czech Republic find as the advantage of decentralized finance?
<ul style="list-style-type: none"> • Draw conclusions on the level of awareness and interest of blockchain investments amongst university students in Prague. 	<ol style="list-style-type: none"> 1. Are University students at Czech University of life science Interested in decentralized finance? 2. Do students in the Czech university of life sciences find potential in decentralized finance in the future? 3. What is the percentage of the Students in Czech university of life science that are currently invested in decentralized finance?

	4. Do students in the Czech universities use decentralized finance?
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3. Methodology

When it comes to constructing your research, there is many aspects that you need to take into consideration to have the right approach to gathering and analysing your data. One of these aspects are the methodology. The researcher's approach of collecting, analysing, and presenting the data for his study is referred to as his methodology. Therefore, it is crucial for this research that we explain the technique that will be applied to the data and information acquired from this research, as well as the rationale behind our choice of methodology. By demonstrating that the methods and techniques used are the ones that best meet the research's aims and objectives, methodology should enable the researcher to defend the design choice. and be able to deliver reliable and useful findings.

The data will be gathered through Questionnaire, which will be analysed by creating Pie graphs of the responses, the graphs will be then analysed, and findings added to the research. The tool of google forms provides automated graphs creation, which will decrease the time consumed for gathering the data. Furthermore, the Researcher will use Chi Square test to test if there is any relationship between different values that is collected in the research. The test will help identify how categorical values are related in the research. The first Chi-Square test will be used in order to try to find if there is a relationship between gender, and their awareness of decentralized finance. This will help identify if Gender has an impact on the level of awareness of decentralized finance. The second Chi Square test will be used to find if there is relationship between gender and whether the respondent has used decentralized finance in the past 2 years. This will help to know if there is relationship between gender and if they use decentralized finance. Lastly, A Chi-Square test will be used to find out if there is relationship between if people use decentralized finance, and if they trust their local banks in conducting their financial activities. This will help add statistical analysis of the data gathered. Improving the overall findings and the benefits of the research.

3.1. Research philosophy

To start with, we must identify the research philosophy. The research philosophy term relates to the development of knowledge and the nature of that knowledge (Saunders et al., 2015) The

research philosophy chosen has important assumptions on how the researcher view the world. Those assumptions will also influence the research strategy. To start with, we must identify the epistemology of the research, Epistemology as defined in the business research book refers to what constitutes acceptable knowledge in a field of study (Saunders et al., 2015). To simplify what epistemology means, is that for different research, there are different research approaches which could be utilized. For example, a researcher to find out information about the feeling of employees toward their managers, will use a different approach than a researcher which is analysing the operation assets of a company. Because the first researcher data that will be collected will be more related to feelings, which is closer to the natural scientist. While the second researcher would be focusing more on the collection and analysis of facts such as number of computers, number of cars etc. Therefore, in this research, due to the nature of the data being collected, the research will be conducted through positivism approach. Because the research will be conducted with regard to visible social reality and because the research's results may result in generalizations that resemble laws, positivism is typically embraced as the philosophical attitude of natural scientists (Saunders et al., 2015). Additionally, the interpretivism approach will serve as the research's supporting epistemology. According to the interpretivist epistemology, it is essential for the researcher to comprehend how people differ from one another as social agents. This underlines the significance of undertaking human research while being aware that the outcomes will be more varied and contain a wide range of variables. rather than counting the number of computers or cars.

On the other hand, ontology is more focused on the nature of reality. the epistemological strategy follows. Ontological approaches can be divided into two categories: subjectivism and objectivism. Subjectivism, on the other hand, maintains that social phenomena are produced from the perception and subsequent actions of those social actors concerned with its existence. Objectivism portrays the position of social entities as existing external to social actors concerned with their existence (Saunders et al., 2015). Due to the type of data being collected for this study, the researched adopted the objectivism approach, as it matches the research data needs. As decentralized finance ecosystem exists outside perception of decentralized finance users and crypto users. However, a secondary approach will be utilized, which will be the subjectivism approach.

3.2. Research Approach

After deciding the research philosophy, it is important to underpin the research approach. Research approach refers to the process of construction of hypothesis. There are two main types

of research approaches, deduction, and induction theory. Deduction theory refers to testing a theory, where a theory is first created, and then it is subjected to rigorous test (Saunders et al., 2015) While on the other hand induction research philosophy relates to the process of creating theory from analysing and testing information and data collected. So due to the nature of this research, which is to analyse and research the level of adaptation of decentralized finance among university students in Prague. The method of inductive inquiry was chosen by the researcher. Since the theory is developed beforehand, prior to the data collection, it is developed at the conclusion of the research, following the collection and analysis of all the data. Additionally, to assist the researcher in covering the entire area of the research assignment, a complementary deductive technique will be adopted.

3.3. Research Strategy

Research strategy is a crucial component of research because it is where the researcher decides how to go about collecting the data for the study. Different strategies can be used for exploratory, descriptive, and explanatory research. Different research strategy will need to match with specific research philosophies and approaches. Due to the nature of this research, and the need to research the level of adaptation of decentralized finance among university students in Prague. The researcher decided that the research strategy that will be utilized in this research will be survey method. Survey method is usually associated with deductive approach. And it is often used for descriptive research. Utilizing the survey method, you can gather quantitative data for quantitative analysis using both descriptive and inferential statistics. Additionally, models of specific correlations between variables can be created utilizing the data gathered using a survey technique, along with suggestions for potential causes. When sampling is used, it is feasible to provide results that are representative of the entire population at a lesser cost than collecting the data for the entire population, which should allow you greater control over the research process.

Therefore, to gather information about the level of adaptation of decentralized finance among university students in Prague. The most applicable approach to gather this data in timely manner was questionnaire. This is because questionnaires offer researchers a quick method to gather a large amount of data in a short period of time. The type of data that will be gathered from the questionnaire is qualitative data.

The questionnaire consisted of 14 multiple choice questions. The aim of the questionnaire was to conduct survey among university students in Prague to try find out the level of adaptation of decentralized finance among university students in Prague. The sample size of 120 respondents

was requested by the thesis supervisor Vladmir Krepl, where the thesis supervisor considered that having 120 responses as a fair sample considering the short period of time required, and so there would still be time to analyse the data and present it in the final thesis. The Questionnaires were handed out to students in person at the campus of Czech University of life sciences, and at the students in the Czech Technical library as it is a main hub for studying for university students in Prague. The respondents were given 10 minutes to answer the survey, and the responses were all saved automatically at the google form docs where the questionnaires are published.



Figure 1 Questionnaire cover page (Ibrahim, 2022)

The data gathered from the questionnaire would then be analysed by the google forms platform. Where it will automatically create charts that represents the responses and their choices. These graphs will be used to present the data and used to create conclusion for the research.

The Questionnaire will include the following cover page which introduces the respondents to the survey and provides them with basic information about the research purposes and different point of contacts that can be used for any further Questions.

3.4. Chi Square test

After gathering the data from the questionnaires and analyzing the responses and recording relevant trends. The researcher will also use Chi square test method to find any correlation or connection between different variables in the questionnaire. Chi square tests is often used to test hypothesis (Hayes, 2022).

Given the size of the sample and the number of variables in the relationship, the chi-square statistic examines the size of any discrepancies between the expected results and the actual results. When data are being evaluated from a random sample and the variable in issue is a categorical variable, a chi-square test is applicable. A categorical variable is one that includes options like the type of automobile someone drives, their race, level of schooling, whether they are male or female, or how much they like a particular political candidate. These kinds of data are frequently gathered through questionnaires or survey responses. Therefore, when examining this kind of data, chi-square analysis is frequently the most helpful.

The research methodology that was used during the research has deemed to comply with fulfilling the requirement of the research. The findings helped answer the research questions and helped create conclusions for the research.

4. Literature Review

4.1. The origin of decentralized finance

The foundation of decentralized finance originated when bitcoin whitepaper was first published in 2008 under the name “Bitcoin: A peer-to-peer electronic cash system”. Bitcoin is the first blockchain based peer to peer currency in the world (POPESCU, 2021). The white paper was uploaded by a person or group of persons under the pseudonym of Satoshi Nakamoto. Which published the first plan or protocol of bitcoin. The main aspect that differentiates bitcoin from other currencies in this world is that it is decentralized. Unlike other financial institutions that often have a central organizing agency to manage, monitor and operate the currency. Bitcoin leverages the blockchain network to guarantee that bitcoin stays operative and neglecting the need for an official gatekeeper or a central gatekeeper. This helps increase trust in the bitcoin network, as everyone has similar access to the network and its information. In a more simple and purposeful explanation, Satoshi Nakamoto created a peer-to-peer network in which people can make transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be altered or adjusted. Without re-doing the proof of work. And this transactions ledger is accessible to everyone at the same access level. Creating equal flow of information across all its users. And preventing any attempt to hide information from its users.

4.2. How Bitcoin Transactions Work

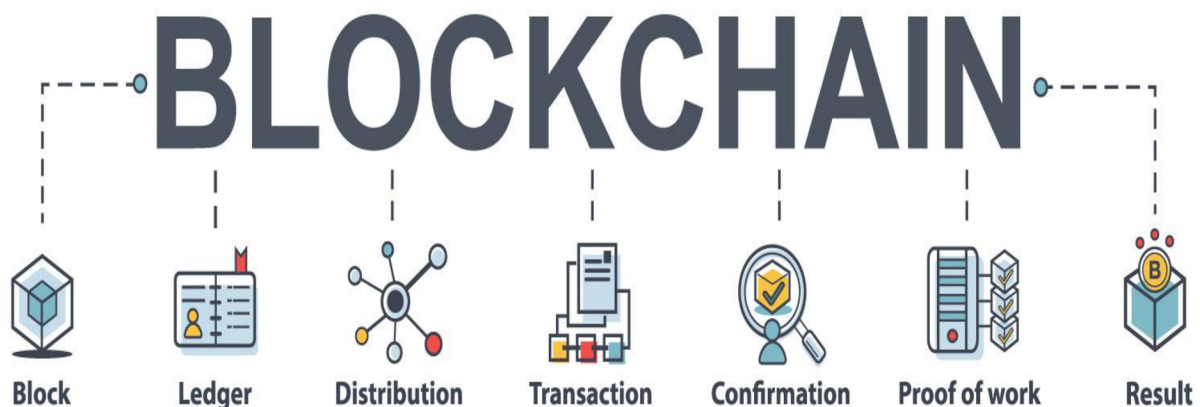


Figure 2 Blockchain Transaction (Scott, 2022)

To be simplified, Bitcoin is a peer-to-peer electronic cash, that allows people online to make payments to be sent directly from one person to another, without going through financial institutions. By having digital signature, it provides part of the solution. And the main benefit of such transaction is that it eliminates the need of a trusted third party. The network

timestamps transactions by hashing them into an ongoing chain of hash-based proof of work, forming a record that cannot be changed without redoing the proof of work.

When a person decides to send bitcoin or crypto currency to another user in the network, the first step is to have an electronic wallet, which will be used to transfer the funds to another wallet in the network, Second, the sender must know the wallet address where the money is to be transferred. The blockchain network creates a signature using your private key and the amount to be delivered after the first wallet requests to send cryptocurrency to the second wallet. It then publishes this signature to the network for miners to verify. The network miners now have the signature and may verify that the wallet contains the specified amount of bitcoin before sending it to the second user. The miners will then add this transaction to the most recent block and have it verified by other miners. The transaction will be saved into that block after receiving a minimum number of validations from various miners, and the validators will be compensated for their work in recording the transaction with validation fees.

This chain, which originates with the greatest CPU resource, serves as evidence for the order in which the events occurred. There isn't much structure needed for the network itself. Nodes are free to leave and re-join the network whenever they want. accepting the longest chain of proofs of work as evidence of what transpired when they were not actively participating in the process.

4.3. The main Decentralized finance networks, and how they operate

There are many different types of decentralized finance networks, coins, or currencies. On the day of writing this research paper, the largest crypto currency in the means of market capital is Bitcoin, with the current market cap of 366.76 billion (CoinMarketCap, 2022). However, at peak of 2021 November, Bitcoin market cap was at 1.3 trillion dollars which is more than many tech companies combined, or even some countries in Europe and middle east. Followed by Ethereum, with the market capital of 159.53B, which at peak of November 2021 was at 569 billion. Followed by Tether, a stable coin with the current market capital of 68.42 billion dollars, which peaked at 84 billion at May 2022. Comes after the fourth largest coin by market capital which is the stable coin USD Coin with the market capital of 45.89 billion. Finally, Binance Coin BNB. With the Current Market Capital of 43.63 billion dollars. And peaked at 105 billion Dollars in November 2021.

You might be wondering, what is the difference between all these different Crypto currencies? Well, let's first find the main common similarity between those crypto currencies. The main

similarity between all the mentioned crypto currencies is that they operate under the blockchain technology. Which is an open source, accessible for everyone form of ledger that anyone can access and monitor transactions in. So, what is the difference between those crypto currencies?

Well, to start with, we must understand that crypto currencies fall into two categories: **Coins** and **tokens**. Coins are native assets of a blockchain, like for example bitcoin or Ethereum. These coins are essential for transactions to occur on the network. While tokens are created within the blockchain, and you can have unlimited number of tokens within a blockchain, however, a blockchain must only have one native asset (Kumar, 2022).

Typically, Coins are created for transactional fees, governance, and other use cases. They can be considered as the infrastructure or a backbone of the blockchain. While tokens can represent myriad of other cases such as gaming, stable coins, NFTs (Kumar, 2022).

So based on this information, the crypto Currencies we just mentioned above can be classified as the following: Bitcoin, Ethereum and Binance are Native Coins. While Tether and USDC are Tokens.

Let's start with bitcoin. Bitcoin is the leader in the crypto sector. This is because it is the first Crypto currency that was published to the world. Secondly, it is the largest in the network by the means of market capitalization. Furthermore, the main unique factor about bitcoin is that the supply of bitcoins is capped to 21 million. And as of June 2022, there is slightly more than 19 million bitcoins currently in circulation. And almost a thousand bitcoins are mined to the system every day, which will drive bitcoin to reach its maximum supply at some point in the future, which is expected to have an impact on its demand. The idea of bitcoin having a supply cap of 21 million, attracted many investors and users, because it fits to the basic economic theory of demand and supply. And theoretically, as the supply of something is decreasing, its price should increase. Therefore, many investors believe the price of bitcoin should continue to increase due to its finite supply. Bitcoin is originally created to be independent of governmental and central bank authorities. It relies on blockchain technology to keep the coin operational. Bitcoin was also the founder of cryptography and consensus (peer-to-peer) verification, which is the foundation of all crypto currencies today (Tardi, 2022). Lastly, A P2P network structure is often decentralized and is created to function at the best interest of all parties involved, rather than primarily benefiting a singular party or a centralized body. A peer-to-peer blockchain network synchronizes various computers to operate as one big computer.

P2P networks should ideally be censorship-resistant, open, public networks that enable the sharing of crucial data and information among all interested parties.

Additionally, Ethereum is the second-largest cryptocurrency in the decentralized financial ecosystem. Ethereum is also based on blockchain technology, but it was designed as a programmable blockchain (Tardi, 2022) which means that it was not only created or designed to support currency. It was also designed to allow developers and network users to create, publish, monetize, and deploy decentralized applications which are sometimes referred as (dApps). Ether is the main native currency of the Ethereum network. Which means, all the transactions in the Ethereum network must be confirmed with Ethereum. Ethereum has also been the blockchain where the concept of NFTs originated. NFTs stand for Non-Fungible Tokens (Explain what is NFTs here). The main difference between Ethereum and Bitcoin is that bitcoin was created as a form of currency and a hold of value, While Ethereum is created to allow developers and users to create decentralized apps, smart contracts, digital games, and collectibles. Which gives room for infinite creations that can utilize those tools to create great services for its users.

Thirdly, Tether is the world's first crypto currency to be marketed as a stable coin, a new type of crypto currencies known as Fiat collateralized stable coins. The value tether coin is directly pegged to the US dollar. This was created as a tool to protect investors from the volatility of crypto currencies. Allowing investors to exchange their crypto currencies to Dollar pegged currency (Tether) to protect their gains from investments in the decentralized finance. Allowing the investors to save their profits in the form of dollars, protecting them from any further volatility in the crypto currency network. So, tether was never intended to be a speculative investment, but rather a stable coin to save your funds. However, it is important to understand that Tether does not have its own blockchain. Tether is a Centralized entity. The company tether has the power to issue (mint) and destroy (burn) USDT tokens at any point to adjust the supply of the coin in circulation. Which raises many questions about the Integrity of tether as a coin, and how far we can trust the entity behind it. Many people believe that Tether holds a drastic power over the blockchain network. Because it is basically the lifeblood of crypto ecosystem. People are worried that if tether plans to suddenly increase its supply in the network, it may impact the Integrity of the evaluation of these crypto currencies. This happened when in May 2022 tether lost its peg to the dollar for a short period of time, which resulted in the rest of crypto currencies plummeting in the fears of an ecosystem collapse to due tether losing its pegging.

Fourthly, another digital stable coin linked to the dollar is called USDC Coin. It is run by a group known as Center. it was established by a group called Circle. In the decentralized finance ecosystem, USDC is regarded as the second-largest stable coin (Hicks, 2022). The market capitalization of USDC peaked at 24th of June 2022 reaching 55.79 billion, while it is currently at 43.9 billion at the time of writing this report on the 21st of October 2022. To put this more into perspective, together USDC and Tether account for 80% of the capitalization of the global stable coin market (Hicks, 2022). The coin was originally launched in 2018 and was initially planned to be a regulated stable coin that runs on the blockchain technology. One of the main advantages stable coins offer to crypto traders and users is that it allows them to buy and sell other crypto currencies without having to move real money in and out of exchanges. Facilitating better trading experience. It also allows traders and investors to be able to quickly exchange their economic gains from other crypto currencies and save their profit in fiat currencies. USDC can be transferred 24/7 and is faster than many other crypto currencies. Allowing people to make transactions faster and cheaper. Reducing the cost for transferring assets.

Lastly, BNB coin is a cryptocurrency that was issue by Binance exchange and trades with the BNB symbol. The Coin was founded in July 2017, and it initially ran on the Ethereum Blockchain with ERC 20 standard (Frankenfield, 2022). Binance originally was operating on the Ethereum network, However, now it is the native currency of Binance own blockchain, the Binance Chain. The Binance exchange is currently the largest exchange worldwide, which allows trading of more than 600 crypto currencies and provides other services such as NFTs, Loans, launchpads for new tokens or coins, and Binance credit card. The coin Initially started with 100 million Binance tokens as supply. However, Every Quarter, the Binance committee uses one fifth of its profits to re-purchase and permanently burn the Binance coins held in its treasury. This is to try to decrease the number of Binance coins in supply/circulation and therefore increase its price.

The coin BNB can be used in many ways, it can be used to pay transaction fees on binance.com and Binance blockchain network. It can also be used for payments at travel accommodation sites such as Travelbybit, trip.io. it can be used for entertainment purposes such as buying gift cards. Or pay for online services, or even financial activities such as taking a loan. This is all possible due to the sophisticated Binance exchange which offers its users many different services.

4.4. The market capitalization of decentralized finance

The Total Market Capital of decentralized finance as of writing this statement on the 14th of October 2022 is 978 billion dollars \$. That is -60% change from one year ago on 14th of October 2021 (*Crypto market cap charts 2022*). As we can see from the chart provided below, the market capitalization of crypto currency has peaked in November 2021, reaching the total market capitalization of 3 trillion dollars. And then continued to drop periodically until it reached 978 billion dollars today. To put that into perspective, The total market capital of German companies listed on the Frankfurt stock exchange equals to 2.21 trillion euros (Statista, 2022). So, during November 2021, the market capital of decentralized finance exceeded the total market capital of the whole Germany stock exchange market. Which is one of the major economies in the world.

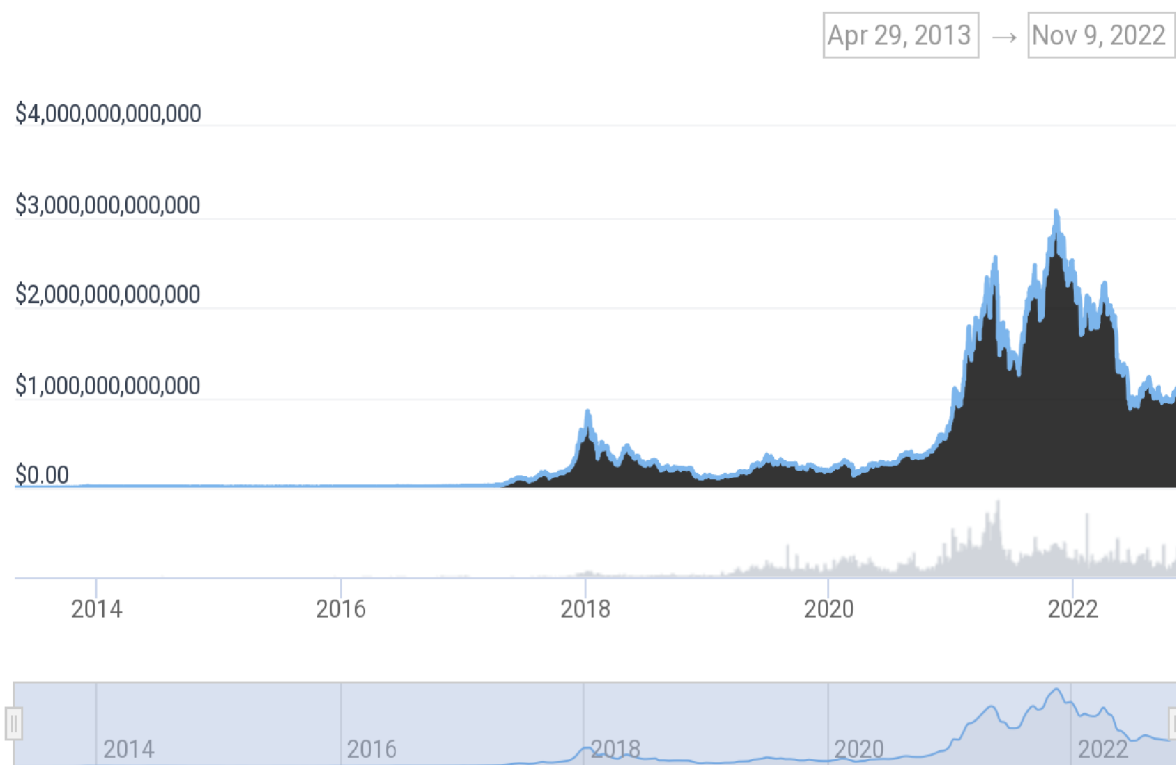


Figure 3 Total Crypto Currencies Market Cap (*Crypto market cap charts 2022*)

4.5. Transaction fees of decentralized finance

Transaction fees are referred as Gas fees in the blockchain network. Gas fees are required to successfully conduct a transaction on the blockchain network. And gas fees are usually priced in tiny fractions of the original transaction being executed. The price of gas fees is determined based on many aspects, the main aspects of determining the gas fees are supply, demand, and

network capacity and the time of executing the transaction (Frankenfield, 2022). The idea of gas fees is created to compensate the blockchain miners for the work done in maintaining and book-keeping the blockchain network. While making a crypto transaction, the users can choose the amount of gas they are willing to pay, there is gas limit which cannot be paid less than it. The higher you pay for gas fees, the higher the priority will be for the miners to execute your transaction, and the opposite is also correct, the less gas fees paid for a transaction will impact its transaction speed by decreasing its priority, therefore less miners will be interested in executing the transaction for you. Furthermore, gas price is the price per unit of work done, therefore if the transaction amount is larger, the gas price for that transaction will also increase, due to the increased number of units in the transaction (Frankenfield, 2022). The transaction is then executed by miners or validators, by verifying and processing the transaction on the network, and then are awarded a fee in return for their computing power provided. Furthermore, Another Aspect to be considerate about is the supply and demand for the transactions dictate the transaction gas prices. If the network is congested, with an increase of requested transactions, the gas prices might increase in that time. But if the demand for transactions is low, the gas price for transactions will also decrease due to no traffic.

You might be wondering, why do I need to pay gas fees to execute a transaction? Well, it is because it is what incentives miners and validators to be providing this service. Because if miners could not benefit from keeping the blockchain network running, there would be no reason for miners to invest in becoming a validator in the network. The network would not be able to operate decentralized if the miners are not supporting by keeping the blockchain active and recording transactions to the public ledger.

4.6. Decentralized finance as a substitute to traditional finance.

Decentralized finance has shown to be useful in many different aspects of the world and the economy. One scenario occurred in Ukraine, where the Kyiv government was in severe need of donations and has shown interest in using decentralized finance as a tool to receive donations and financial support to improve its national defense. After that Ukrainian government tweeted that the country now accepts international support aid via crypto currencies, the country quickly gathered more than 100 million dollars in financial aid in a short period of time (Dermarkar & Hazgui, 2022).



Ukraine / Україна ✓

@Ukraine

Ukraine government organization

Stand with the people of Ukraine. Now accepting cryptocurrency donations. Bitcoin, Ethereum and USDT.

BTC - 357a3So9CbsNfBBgFYACGvxxS6tMaDoa1P

ETH and USDT (ERC-20) -
0x165CD37b4C644C2921454429E7F9358d18A45e14

4:29 PM · Feb 26, 2022 · Twitter for iPhone

55.8K Retweets 13.9K Quote Tweets 210.1K Likes



Figure 4(Stand with the people of Ukraine. now accepting cryptocurrency donations. bitcoin, Ethereum and USDT 2022)

Ukraine Leveraged the power of decentralized finance to gather more donations. This provided a way for the Ukrainian government to receive donations with less levels of bureaucracy for the transaction to be completed. This allowed the Ukrainian government to receive the funds directly to its electronic wallet without the need to wait for bank confirmations and other traditional financial system bureaucracy. This is a large improvement to the traditional way of donations, where your bank and local government would know about your donation. Another advantage that the crypto currency donations had over other form of donations, is that they were relatively faster received rather than the traditional means of donation. This is because there was absence of intermediaries. Which often slow down the process, and even take a cut of the donation to process as fees. Because in comparison with the Bank transferred donations, which would take up to several days to

arrive to the Ukrainian government, the crypto currency asset transfers were deposited within minutes. Allowing the government to be able to access and use the funds in a faster manner. This demonstrates a strong use case of decentralized finance where it can move quicker between countries, decreasing the need of middlemen and banks that often require a percentage of the transaction.

Decentralized finance not only benefited the people of Ukraine during the Ukrainian Russian war. The Russians also used decentralized finance to their benefit. As it may be known for many people, the Russian government and banks received a hefty share of sanctions during the past few years. This has impacted the ability for the Russian citizens to be able to store, save and spend their funds internationally, Because the Russian local banks were sanctioned to be prevented to make international payments, deposits, and many other financial activities. This pushed the Russian citizens to use decentralized finance as a new form of financial system that serves their needs. By using decentralized finance, the locals in Russia were able to conduct purchases internationally while the governments cannot seize their funds or stop them from conducting any purchase. There are numerous reports of Russian citizens that used crypto currencies as haven to allow them to use their funds and avoid numerous restrictions and vulnerabilities imposed on them by western governments and agencies (Dermarkar & Hazgui, 2022). This showed that decentralized finance can act as a tool for the citizens, when the original financial system is put against them, or is not functioning to the people's best interest.

One of the use cases of decentralized finance is to support governments and people from different part of the world. Just days before the Russian invasion in Ukraine, there was a truckers protest movement in Canada called the "freedom Convoy" that opposes the government health measures. To support the protest, the organizers launched a campaign to fund their cause through GoFundMe website. However, after collecting over 10 million dollars in donations, the platform seized the 10 million donations that were raised (Dermarkar & Hazgui, 2022). This meant that the organizers were not able to use the money that the public donated to them due to the governmental interference. This forced the organizers to look for another way to receive donations and overcome the sanctions that the authorities have imposed, they then used crypto Currency to receive donations. After setting up a crypto currency donation fund, the organizers were able to raise 1 million in matter of days. Which this time the Canadian authorities were not able to seize. This is a short example of the power that decentralized finance can impose on the community and overcome traditional barriers such as banks, states, and governments. However, this example is not used to support or to be against

the freedoms truckers' convoy, it is only used as an example of how decentralized finance can be used by the people when the traditional finance system is not working at their best interests. But the researcher has no interest to support or to be against the freedom convoy in Canada. It was just used for research purposes and to illustrate different scenarios where decentralized finance could be used.

Another example of decentralized finance being used as a secondary economic tool is in Lebanon. After the traditional financial system collapsed in Lebanon, many locals have switched to using decentralized finance to conduct transactions and store the value of their funds. According to CNBC, many locals in Lebanon now use tether stable coin to buy groceries in Lebanon after the economic collapse (Sigalos, 2022). And majority of the Lebanese population trust the decentralized finance network to support their finance better than their traditional financial system which has collapsed in 2019.

As it can be seen from the analysis provided above, decentralized finance can act as a perfect replacement for traditional financial system once it collapses. Offering people new tool to invest, exchange and store goods and services. Where if it did not exist, people in those economies would have harder time to try and create a substitute for their financial system.

4.7. How Bitcoin is Mined



Figure 5 How Bitcoin is mined (Ojogabonitoo, 2018)

The process of minting, holding and transactions of bitcoins is done through computers owned by people called “miners”. Once a new Coin is minted, the miners race to be the ones to validate the transaction and enter them into the public ledger of all bitcoin transactions. And the miners which end up registering that transaction are the ones to receive a cut of the gas fees paid. This is one way of making money through the bitcoin ledger network. Another way of making bitcoins in the network is by mining. Mining is performed by using sophisticated hardware that solves extremely complex computational math problem, and the first computer to be able to solve this complex math computational problem receives the next block of bitcoins, and then the process repeats again (Hong, 2022) This bitcoin rewards that are given to miners’ incentives people to mine more and keep the network running. Because those mined bitcoins can at any time be traded with international exchanges for other assets such as Dollars or Euros. Allowing miners to financially benefit from their computers and to keep the blockchain network running. And because many people in this world share this responsibility, this makes the bitcoin network decentralized. Because the mining process is not fixed or saturated to any specific location on the planet. You can mine whenever and wherever you are if you have the necessary equipment and internet connection to process mining. Which creates a competitive edge against centralized finance where only specific financial institutions are allowed to create, monitor, and manage the money in the financial system.

4.8. The energy consumed from decentralized finance networks.

To analyze decentralized finance, we must take into consideration on crucial aspect of creating, maintaining, and operating the decentralized finance network, The energy usage of this network. It is stated that the process of creating, and spending bitcoins consumes around 91 terawatts hours of electricity annually. That is more than what a whole nation like Finland the nation of 5.5 million citizens uses in a full year (Huang et al., 2021). This is a lot of energy, considering it only needs electricity and not large machinery or engineering. To put that into perspective, the network of decentralized finance uses half a percent of the whole world’s electricity consumed. Which has increased more than 10 times in the past 5 years. To put it into different perspective, the bitcoin network uses the same amount of electricity that Washington uses as a state yearly (Huang et al., 2021). In the early day of bitcoin, it was much easier to mine bitcoins that it is now. The graph below shows how the energy required to mine one bitcoin has change over time.

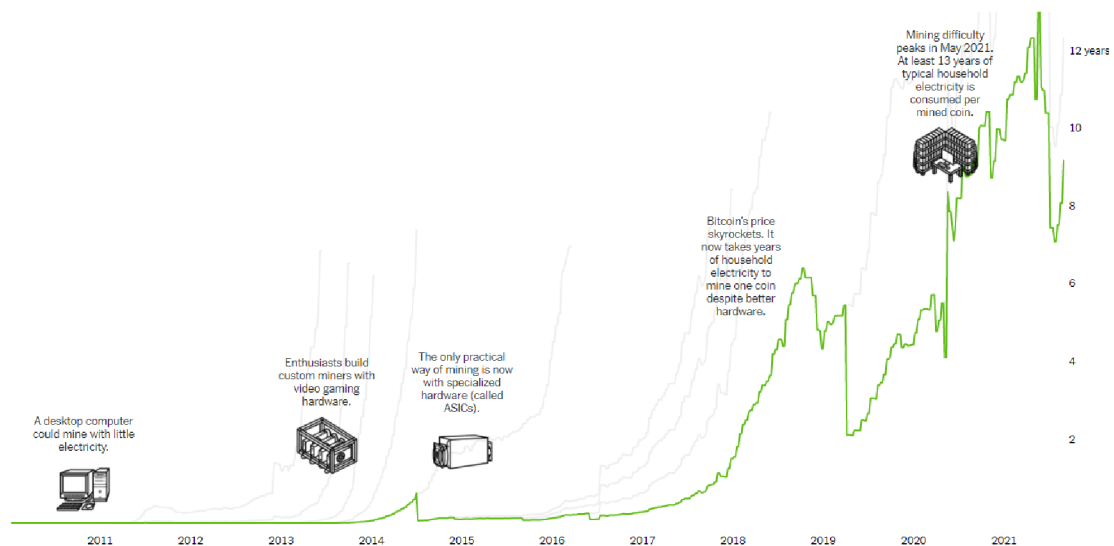


Figure 6 Bitcoin Energy Usage (Gupta, 2021)

As we can see from the graph provided above, the computing power required to mine a single bitcoin has been drastically increasing over time in the past years. In 2011, a single home desktop computer was able to mine a single bitcoin with little energy needed. But in May 2021, the computing power required to mine a single bitcoin equals to over 13 years of average household energy usage is required to mine a single bitcoin (Huang et al., 2021). This raised many ethical questions on whether the decentralized finance anonymity is worth all this amount of energy. Specially at times where the world is struggling to cut down its energy usage to combat the main problem of the world today which is global warming. Moreover, the bitcoin mining computing power has been too concentrated, that only seven mining groups own nearly 80 percent of all the computing power in the network. That is why miners often move to countries where there is abundance of electricity or cheap electricity.

For many years, the bitcoin mining center of the world used to be China, where 75% of the bitcoin mining computing power came from China. However, after the Chinese government crackdown on mining, to preserve energy and tackle the climate change, the computing power of Chinese miners went down from 75% to 46% (Huang et al., 2021) meanwhile, the US share of the mining power grew to 16% from 4% during the same period.

The impact of bitcoin mining does not only stop at the consumed electricity, but there is also a different type of environmental impact happening from mining bitcoins. It is the hardware waste being created by mining bitcoins. Because every year, the requirement to mine bitcoin

is increasing in the means of CPU power and processing power, this means that miners usually must upgrade their mining gears to have faster mining and better chances at solving the complicated puzzles. Which causes a high turnover and a new e-waste problem. It is believed that every year and half, the computing power needed to mine a single bitcoin double. Making older mining rigs to be less efficient and less valuable to the miners, which they are forced to sell. And exchange for new hardware. Even though this hardware could be still beneficial for many other computing process, it is no longer beneficial for the miners which are always looking for the best computers to support them with their mining processes. According to the bitcoin waste monitor, Bitcoin is currently creating more waste than some mid-size countries. With the annual total waste created by bitcoin reaching to 42.82 kt waste.

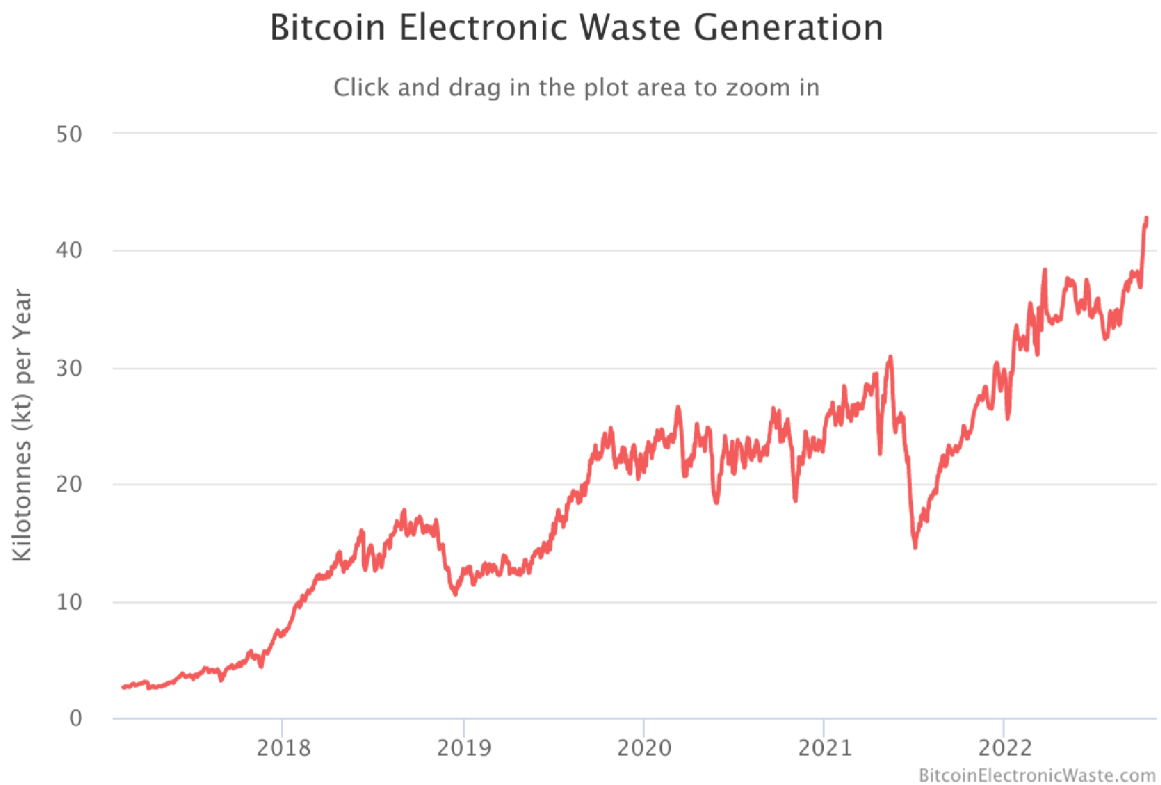


Figure 7 Bitcoin Electronic Waste Generation (DIgiConomist, 2021)

However, bitcoin miners seem to not care about the E-waste and Electric consumption issue because they do not have the proper solution and the moment, and the level of financial gains overcome the sense the ownership regarding our planet and longevity of the planet.

4.9. The lack of regulation in decentralized finance.

Decentralized finance provides a novel way of providing financial services to people and customers. Where users can use the same financial tools that are available in the modern

financial world but provided by decentralized finance providers and protocols. The only difference between decentralized finance and modern/traditional finance is that in decentralized finance there is no intermediaries, and it relies on automated protocols instead. Because of that, the size of decentralized finance has grown exponentially over the last year. The size of decentralized finance is mainly measured by the sum of all the digital assets that are used in defi protocols. Also known as TVL “Total Volume Locked”. Which has increased drastically from 18 billion in January 2021 to over 240 billion by the end of December 2021(Born et al., 2022). There are many decentralized finance crypto platforms that offer a replicate of the traditional finance services within the crypto asset’s ecosystem in an unregulated and decentralized way. So, people can lend, collateral, and provide crypto derivatives investments without central intermediaries. This means that if any of the transactions, or the platforms used to create those investments ever fail or gets shutdown. There is no regulatory organization that can step in an provide support for the investors. Helping them find their money, or the person behind the stolen money. This creates a large disadvantage and risk throughout the decentralized finance system. However, for many people they believe it is a risk they are willing to take in the favors of decentralized finance.

5. Questionnaire findings

To find out the level of adaptation of decentralized finance among university students in Prague. The researcher decided that the best method to gather such large amount of data in a short period of time was through questionnaire method. This would allow the researcher to be able to find the level of adaptation of decentralized finance in a short period of time from many respondents. The researcher created a questionnaire which was shared with university students in Prague. Majority of the respondents were asked to solve the questionnaire at the Czech University of life sciences campus, or at the Czech technical university library. The researcher chose the Czech technical university library as it is a studying hub for many different university students in Prague as it provides large and well architectural facility where students from different universities can study together.

The researcher was requested to gather responses from 120 students as requested by his thesis supervisor Vladmir Krepl. And was able to gather 122 respondents over 2 weeks. The questionnaire data will be analyzed below and feedback from the researcher will also be provided.

The First question in the questionnaire asked the respondents about their Gender, this question was created to try to find out if there is connection between gender and their knowledge about decentralized finance. The question stated (Can you please specify your gender?) where 36.1% of the respondents were female and the other 63.9% are males as seen in the graph provided below.

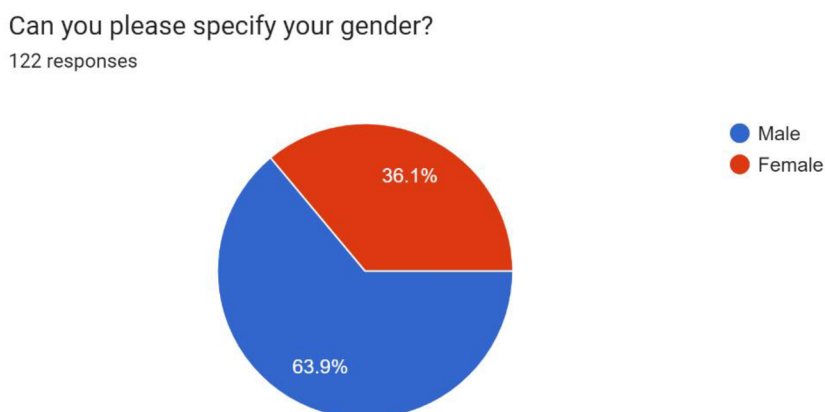


Figure 8 Research findings, Question 1 (Ibrahim, 2022)

Question 2; What University are you studying in?

What University are you studying in?

122 responses

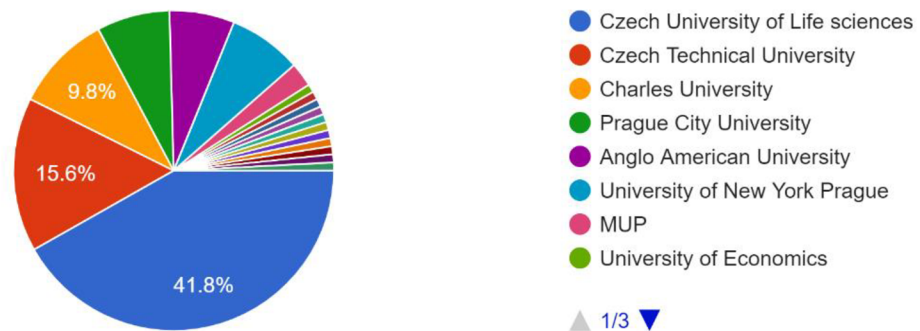


Figure 9 Research findings, Question 2 (Ibrahim, 2022)

As you can see from the graph provided above, most of the respondents are from the Czech University of Life Sciences, with 41.8% of the respondents are from Czech university of life sciences, which equals to 51 respondents of the 122. Followed by 15.6% from the Czech technical university, which was the location where the questionnaire was also handed out. Followed by 9.8% from Charles university. While the rest are majorly from Prague City university, Anglo American University, and University of New York in Prague. Gathering feedback from this many different universities helped the researcher gather diverse feedback and point of views which could help answer the researcher's research question which is "the level of adaptation of decentralized finance among university students in the Czech Republic"

Question 3; Do you know what Decentralized Finance (Crypto currencies) is?

Do you know what Decentralized Finance (Crypto currencies) is?

121 responses

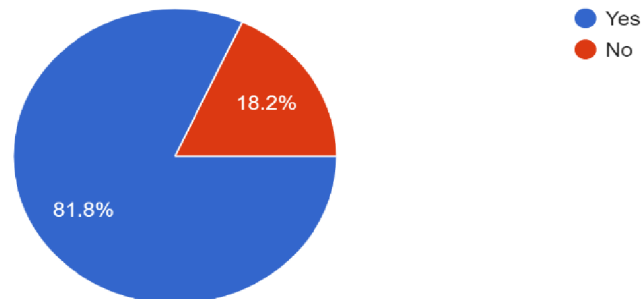


Figure 10 Research findings, Question 3 (Ibrahim, 2022)

The Third question is asked to help understand whether university students in the Prague know what is decentralized finance or crypto currency is. Which would help back up our research questions with information about the level of awareness and understanding of decentralized finance among university students in the Czech Republic. The response was that majority of the respondents (81.8%) of the 120 respondents indeed know what decentralized finance is. Which is a strong indicator that decentralized finance is growing in popularity among university students in Prague. Whether it was for investments, trading, buying NFTs, these answers will be found out in the upcoming questions.

With this level of awareness of decentralized finance, it means that the adoption stage can be achieved much faster than before when people did not know about decentralized finance.

Question 4; How well do you think you understand how decentralized finance (Crypto currency) work?

How well do you think you understand how decentralized finance (Crypto currency) work?
122 responses

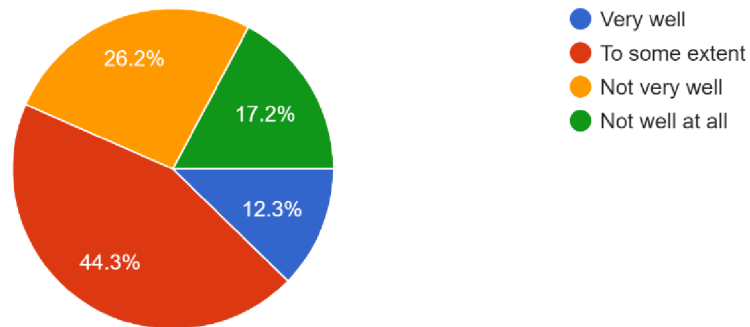


Figure 11 Research findings, Question 4 (Ibrahim, 2022)

The fourth question was asked to try have a view of the level of understanding that university students in Prague currently have regarding decentralized finance. The answers were surprising as majority of the respondents did understand decentralized finance to some extent. With 44.3% of the respondents choosing this option. While other 12.3 percent of the people understand decentralized finance very well. This explains the why majority of the people would rather be interacting with the traditional financial system as they understand it better than the decentralized one. However, this also shows that 56.6% of the overall respondents have a positive level of understanding of decentralized finance, while the other 43.4 percent does not. Which raises the importance of increased education and trainings for what is decentralized finance and what could be its benefits to the economy and consumers.

Based on the findings of this question, even the young generation of the world still needs education about decentralized finance, which means that the older generations would also benefit from trainings and education regarding decentralized finance.

Question 5; Have you made a Decentralized Finance transaction in the last 2 years?

Have you made a Decentralized Finance transaction in the last 2 years?

122 responses

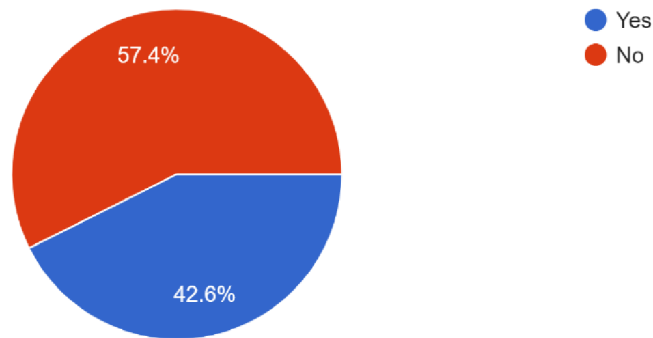


Figure 12 Research findings, Question 5 (Ibrahim, 2022)

When asking the respondents about whether they have made a decentralized finance transaction in the past 2 years, their response was surprising. As 42.5% of the respondents indeed did have a decentralized finance transaction in the past 2 years. This is a positive finding towards the research question “whether or not university students in Prague are engaging in decentralized finance”. Considering that decentralized finance started in 2009 and currently 42.5% of university students in Prague have used it in the past 2 years, sends message regarding its functionality. It means that decentralized finance is a tool which can be used to achieve different type of activities. In the upcoming question we will be trying to find out in what ways did the university students in Prague use decentralized finance. to understand better what the best means of use for such new technology in the financial world could be.

Question 6; If your answer was yes, please specified what was the reason of the transaction?

If your answer was yes, please specify what was the reason of the transaction?

57 responses

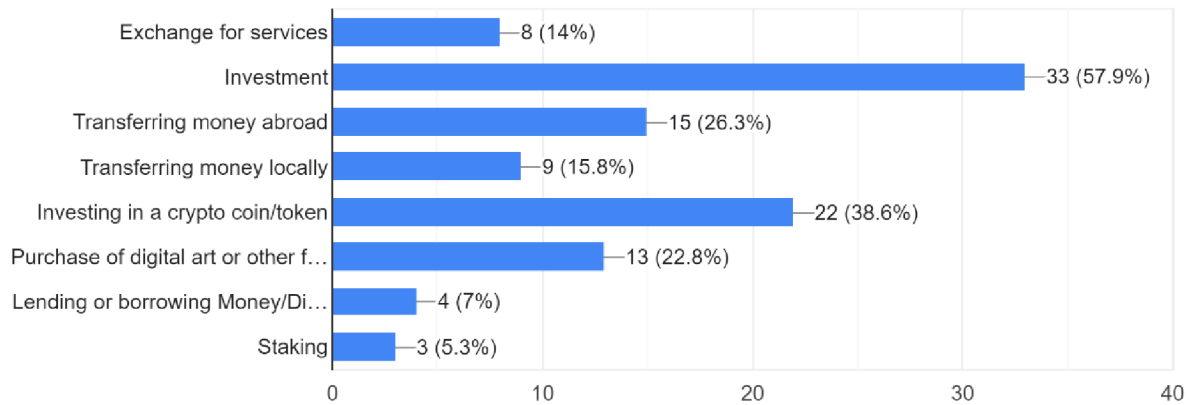


Figure 13 Research findings, Question 6 (Ibrahim, 2022)

Following up from question number 5, the researcher wanted to understand what the services or tools are that university students are utilizing decentralized finance for. The findings were as expected, 57.1% of the users that used decentralized finance in the past 2 years have used it for investment purposes. While the second largest percentage of the users also used it to invest but in a crypto coin/token at 39.3% of the overall responses. Followed by transferring money abroad with 26.8 percent. This shows that majority of university students in Prague use decentralized finance as a new tool of investment to create financial gains for their financial assets. And majority also use it for transferring money abroad as it helps them overcome the expensive banking fees associated with transferring the money to another country. Banks also usually take longer time to transfer money abroad, in contrast with decentralized finance where in all the scenarios it would take less than a day to make an international transfer of assets. Furthermore, the options following in popularity was Exchange of services and transferring money locally. Which shows strong ability for decentralized finance to facilitate transactions. And, be used as means of exchange for services.

Question 7; Do you trust your Country's Central Bank/Government in maintaining your local currency's exchange rate in the long term?

Do you trust your Country's Central Bank/Government in maintaining your local currency's exchange rate in the long term?

122 responses

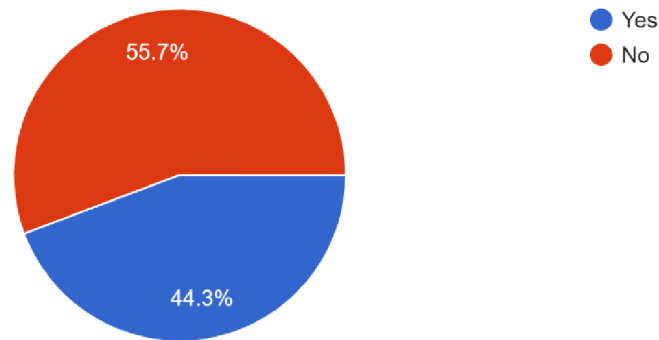


Figure 14 Research findings, Question 7 (Ibrahim, 2022)

This question was asked to find out if there is possibility that young generation would find more trust and reliability in decentralized finance. Because as we discussed in the literature review in this research, one of the main reasons decentralized finance was initiated it was because of the market crash of 2008 and the economic depression created by it. Many people believed it was caused by irresponsible and greedy banks which gambled with the money of the people and their wellbeing.

Reacting to the economic depression created by banks, people wanted a more reliable financial system. And seeing that majority of university students in Prague also do not trust their central banks and governments to operate at their best interest. Provides space for other service providers to fill this gap created by the lack of trust to banks and governments. This means if a decentralized finance substitute to banks is created, more young people would be interested in it.

Question 8; Do you trust your bank at handling your financial activities (Loan fees, Interest rates, money transferring fees) with your best interest in mind?

Do you trust your bank at handling your financial activities (Loan fees, Interest rates, money transferring fees) with your best interest in mind?

122 responses

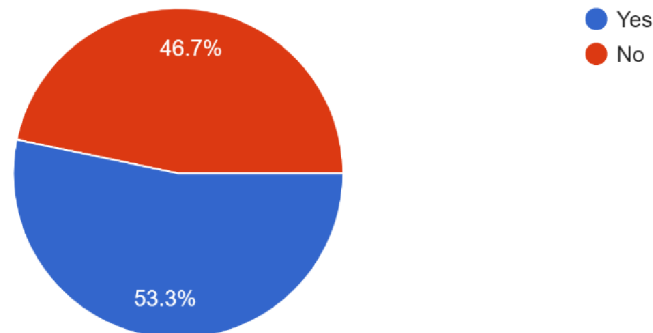


Figure 15 Research findings, Question 8 (Ibrahim, 2022)

Question eight was asked to the respondents to find out whether the university students in Prague trust the banks in handling their financial activities with their best interest in mind. This question was included in the research because it would help the researcher find out if the university students trust and want to work with banks. Because if the university students do not trust banks, this would create a gap where decentralized finance can benefit from. Hence why the question was found important by the research.

The findings were surprising, as a 46.7 of the respondents responded that they in fact do believe that banks carry their financial activities without having the client's best interest in mind. Which is surprising information, considering banks handle all our financial transactions in the modern days. This shows the reason why decentralized finance userbase is increasing recently as more people are looking for better options rather than relying on their local bank to cover their financial activities.

Question 9; Do you think the trend of using Decentralized finance (Crypto currencies) to conduct financial transactions will increase or decrease in the future?

Do you think the trend of using Decentralized finance (Crypto currencies) to conduct financial transactions will increase or decrease in the future?

119 responses

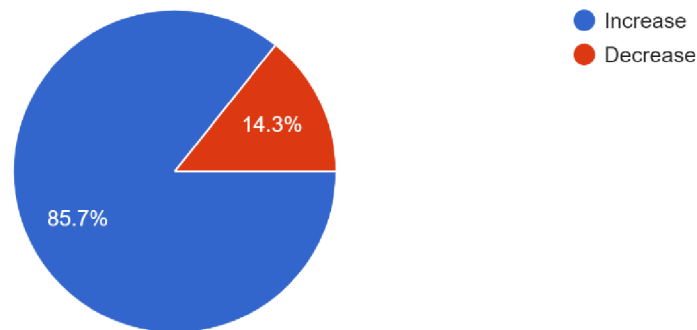


Figure 16 Research findings, Question 9 (Ibrahim, 2022)

Question number nine was asked to the respondents to try to give their feedback if they think the trend of decentralized finance is expected to increase or decrease from now on. This would help the researcher understand the current expectations of decentralized finance and whether university students of Prague find potential in it in the long term. The answers were surprising as 85.5% of the respondents believe that in fact the trend of using decentralized finance as a tool to conduct financial transactions will increase in the future. This shows the amount of potential decentralized finance might have as the adoption increases among young university students and international organizations.

Question 10; Do you think the trend of using Decentralized finance (Crypto currencies) as an investment tool will increase or decrease in the future?

Do you think the trend of using Decentralized finance (Crypto currencies) as an investment tool will increase or decrease in the future?

119 responses

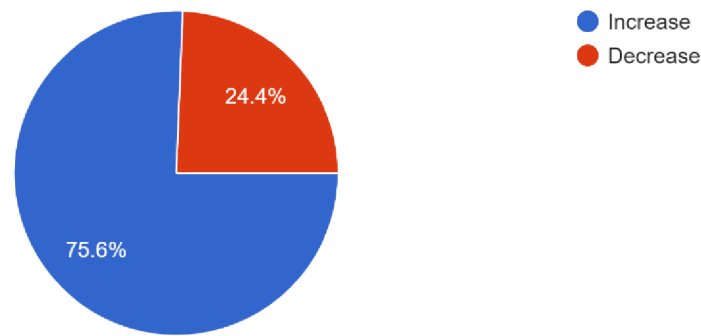


Figure 17 Research findings, Question 10 (Ibrahim, 2022)

Question number ten is created to find out if young university students in Prague think the trend of decentralized finance will be increased as a form of transaction, or an investment form. And the findings are that university students also believe that using decentralized finance as a form of investment will also increase in the future. This could be expected as the value of the bitcoin from the day it was created until today has increased from less than one-dollar in 2009 to over 16 thousand dollars in 2022. And the price of other of other decentralized finance coins has increased drastically such as Ethereum which increase costed 1 dollar in 2015 and currently costs 1200 dollars in 2022.

This enormous, decentralized finance gains have made decentralized finance investments look as a potential money maker for new generations, which resulted in many of the new generations to use decentralized finance as an investment tool in the future.

Question 11; What do you think are the advantages of Decentralized Finance (Crypto Currencies)?

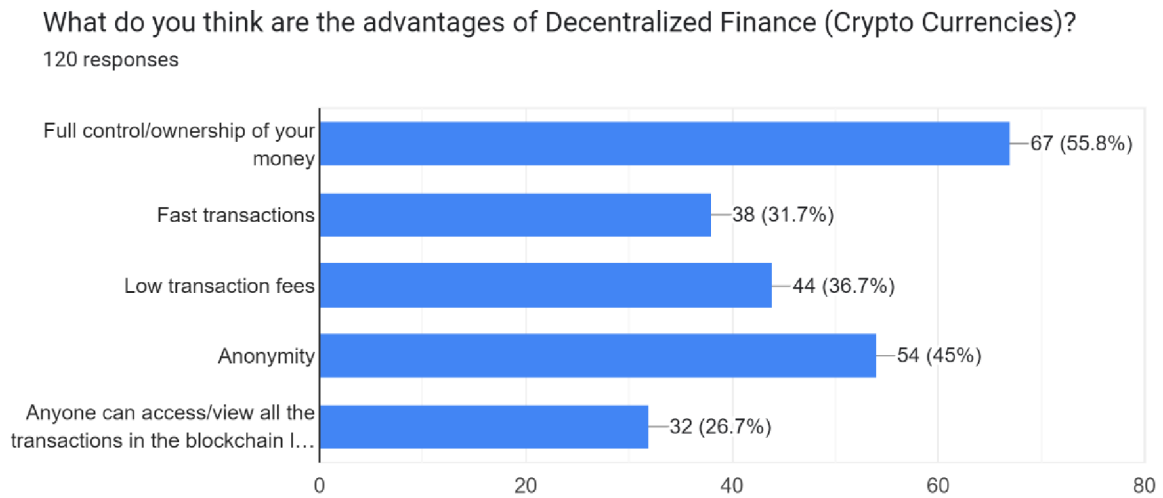


Figure 18 Research findings, Question 11 (Ibrahim, 2022)

Question eleven was asked to the respondents to see what the current university students in Prague find as advantages of decentralized finance. Most of the respondents believe that having full control/ownership of your money is the biggest advantage of decentralized finance. Because as discussed in the literature review above, unlike traditional finance, there is no central governing entity which could for example freeze your account, or hold your funds for investigating, or by any means does anything to your electronic wallet without having your keys. So, if you are the only person which owns the keys to your wallet, there is no other central agency which can use your money or stop you from spending it. Unlike banks, where they can at any point have your account frozen or on hold for many different reasons.

The other most selected reason for advantages of decentralized finance was the anonymity included in decentralized finance. Because you can make transactions to anyone in the world at any time. And no middleman is included in the process. And no public record created.

Question 12; What do you think are the disadvantages of Decentralized Finance (Crypto Currencies)?

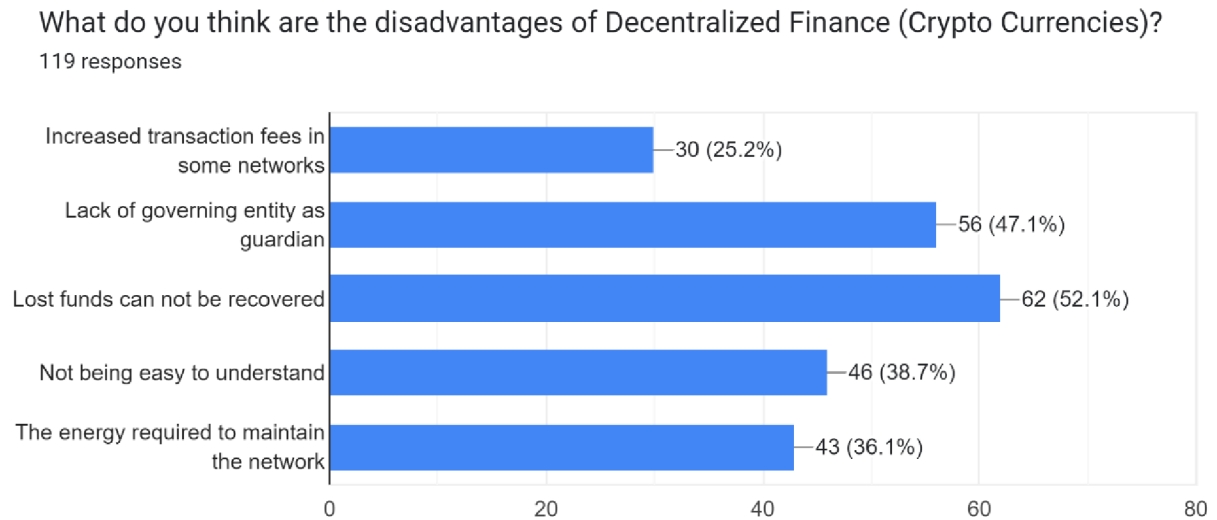


Figure 19 Research findings, Question 12 (Ibrahim, 2022)

Question number twelve was created to find out what young university students in Prague find as disadvantage of decentralized finance. Majority of responses pointed of the fact that lost funds cannot be recovered at all. Which is true, since there is no central entity managing the network or that have large power over the network. If a decentralized finance user sends their tokens/coins to a wrong address or an address that does not exist. Those funds could be lost forever. As there is no way to reverse the transaction or force the other wallet to return the money.

There are many times of people getting locked outside their electronic wallets because they forgot the seed phrase used to unlock the wallet. And there is no other way to access those funds, even though everyone is sure about who is the owner of this wallet. There is still no other way to access the funds without the password seed phrase.

The second most chosen answer was the lack of governing entity as a guardian, which makes sense because that governing entity would help support users with lost funds, or any other issue. However, that would not come in hand with the main attractive concept of decentralized finance which is divided ownership of the network amongst its users.

The third most chosen reason was that the whole blockchain technology and decentralized finance concept is hard to understand, hence less users are attracted to it. That is why major exchanges and crypto platforms offer education about how to set up your wallet and what is the best way to maintain the wallet and to be safe.

Question 13; What do you think would help increase the adoption level of decentralized finance?

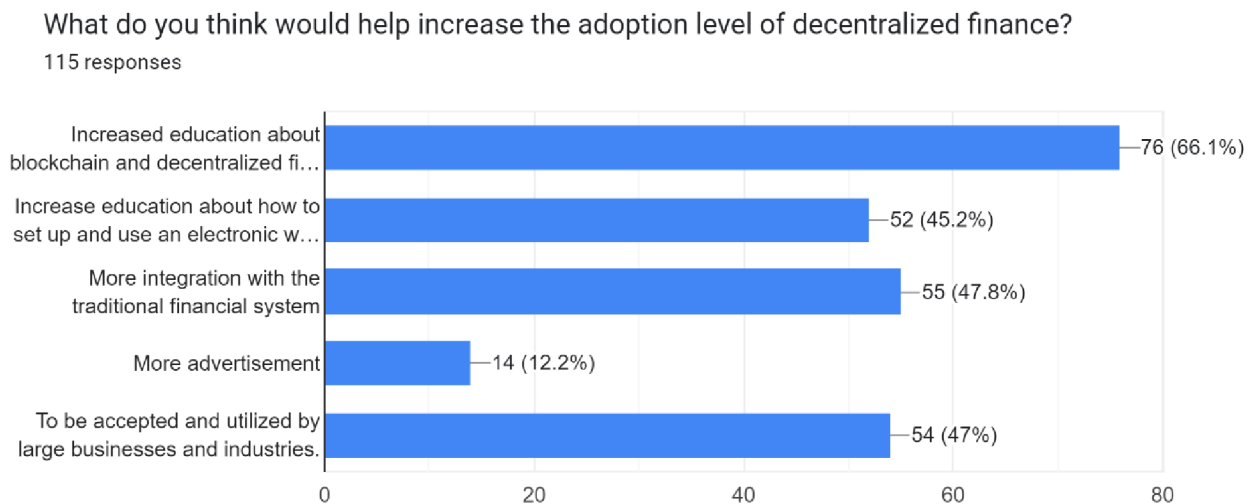


Figure 20 Research findings, Question 13 (Ibrahim, 2022)

Question number thirteen was asked to find out what could possibly help increase the adoption level of decentralized finance. This question would help the researcher create conclusion on what people think could help increase the adoption level of decentralized finance. Most of the respondents 65% responded that increased education about blockchain and decentralized finance could indeed help increases its level of adoption. Which makes sense, as majority of the respondents from the question before about the disadvantages of decentralized finance was that it was hard to understand. So, to increase its users, we must look at options and activities where we can increase the education about blockchain and decentralized finance.

The second most chosen option was to integrate it more with the traditional financial system, and to be accepted and utilized by large businesses and industries. Both options are valuable input, as the current decentralized finance is still in the process of being regulated, to be able to operate side by side with the traditional financial sector. So, if we see more banks increase

its collaboration with decentralized finance, more people will trust decentralized finance and be willing to use it furthermore.

Question 14; Which industries do you think could benefit from the blockchain technology other than the financial sector?

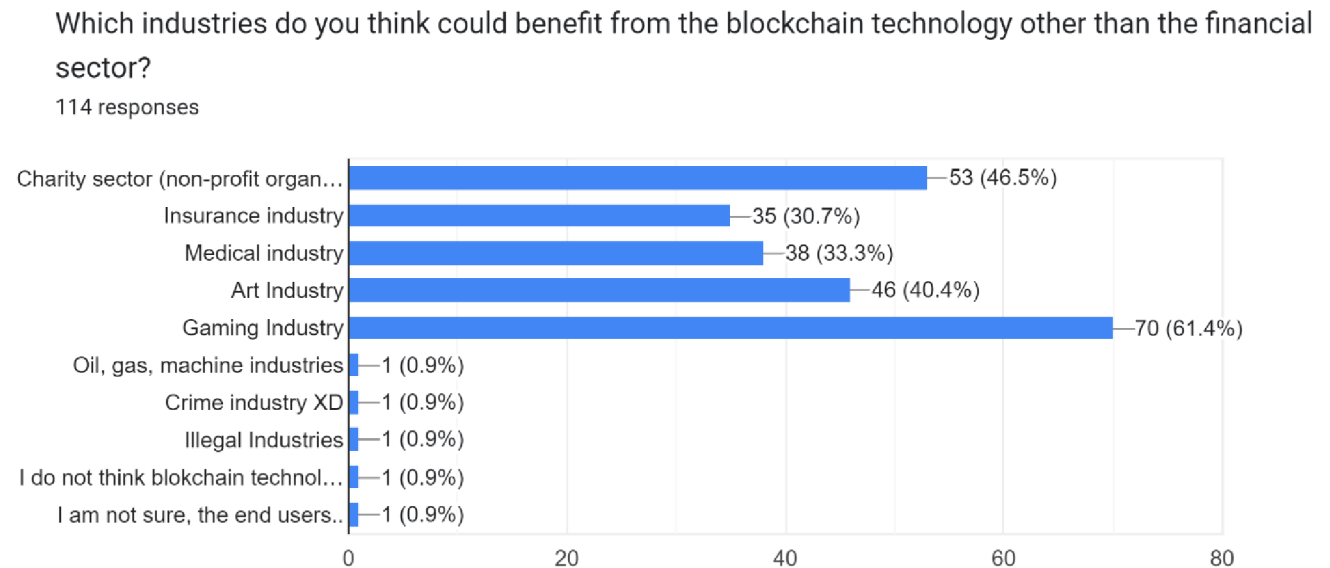


Figure 21 Research findings, Question 14 (Ibrahim, 2022)

Question number 14 was created to find out if the blockchain technology could be beneficial by other industries other than the financial sector. And the answers were majorly in favor of the gaming industry. With over 61.4% choosing the gaming industry as possible industry that could use the blockchain technology. As blockchain technology can improve the process of trading collectibles in games. Allowing users to be able to own the collectible on the blockchain network and trading it with different online players.

The second most chosen option was the charity sector, with over 46% of the respondents choosing it. This makes sense as the charity industry is heavily built on transparency and trust. Which is two aspects the blockchain technology provides with complete ease. Therefore, charity sector could be one of the main beneficial industries when it comes to decentralized finance.

And comes in third position, the art industry with over 40% of the respondents choosing this option. This also makes sense as the trend of NFTs (Non-fungible token) is also increasing

throughout the art industry users. NFTs allows artists to sell their art straight to the clients without the need of a middleman, it also allows the art customers know how many people have owned this art before. By checking the transaction history of the NFT in the blockchain ledger. Helping with preventing scams and increase transparency in the industry.

Question 15; Do you have anything extra to add? (Voluntary)

This question was asked to find out if the university students in Prague anything have extra to be added to the research in which can be beneficial for the study, majority of the answers where not directly related to the question and was used to send greetings to the researcher. However, there are multiple useful answers by different students in Prague which the researcher believe adds more information about the point of view of university students in Prague and will be added below.

At the end from my point of view that crypto currency have its pros and cons but it's cons is much more than its pros because the amount of energy it wast is putting the world in worst situation that how it would be if we didn't use it (and all of the country are going out of natural energy forms "fuel, petro and gas" and this is also affecting on the climate)

Figure 22 Research findings, Question 15 (Ibrahim, 2022)

This respondent showed his point of view, that decentralized finance has its own pros and cons. But however, the cons are much more than the pros. Since as discussed in the literature review in this research. The decentralized finance blockchain network consumes a large quantity of energy to keep running efficiently. With many analyzers estimating the use to be the worth of 13 years of average household usage to mint a single bitcoin. which of course could be better utilized for other purposes. The respondent also stressed that many of the world is now moving to clean energy and using energy for maintaining the blockchain does not match the goal of eliminating unnecessary use of energy.

One respondent also added.

I am not a fan of cryptocurrencies. In my opinion, it can cause problems to society due to small ability to be controlled.

Figure 23 Research findings, Question 15 (Ibrahim, 2022)

Which also indicates that many users are just looking for stability and reliability. Which in many ways decentralized finance does not provide that. Since it is a new technology with a lot of challenges in the network. Which it is understandable that some users may still be resilient in completely accepting the decentralized finance network.

Lastly, another respondent added.

I was thinking about putting a part of my savings into some cryptocurrencies (via Coinbase). But the fees were too high for me. So I invested money into stock market instead. With the recent crisis the investment didn't turn out well, but still way better than if I had put the money in crypto. Investing into crypto is pure speculation IMO.

Figure 24 Research findings, Question 15 (Ibrahim, 2022)

He mentioned that he wanted to invest in decentralized finance but was not interested in the high fees associated with it using Coinbase platform. However, he instead invested it in the stock market. Which the recent economic crisis in the world has made him lose a part of his investment. However, he believes that the losses created in the stock market is more bearable than the losses he would have accumulated if he has invested in the decentralized finance crypto market. Lastly adding that investing in crypto is pure speculation in his opinion. Which is a reasonable and valuable feedback to this research.

The researcher believes the decentralized finance because it is a new market, with a very weak and immature foundation. Therefore, decentralized finance can suffer more from economic crises because it is still a new project, and many people are not sure how decentralized finance will turn out. Unlike stocks investments which has been around for as far as we have been alive for. We are more used to the stock market and can see the assets in the stock market clearly. Whether it is by their brand image, assets, sales. However, the value of crypto assets is still hard to quantify. Which makes investors make cautious when investing in crypto rather than

traditional stock market where they can feel more safe knowing these are real companies, and that the stock market has some source of organized operating mechanism that has kept it running for years, and constantly has survived different types of economic crashes.

5.1. Chi Square Analysis for Questionnaire data.

To test the relationship between different variables in the research, Chi square statistical test will be used to try to find if there is correlation between gender of the respondent and whether they know what is decentralized finance. This means we will be conducting chi square test for question 1 and question 3 in the questionnaire that was sent out. Question 1; What is your gender. And question 3; Do you know what Decentralized Finance (Crypto currencies) is? Below is the hypothesis that will be used for the chi square analysis.

Null Hypothesis; There is no association between gender and decentralized finance awareness.									
Alternative hypothesis; There is association between gender and whether they knew decentralized finance or not.									

Figure 25 Hypothesis for Questions 1 and 3

To calculate the P value, we must first create the table of observed values and table of Expected Values. Below is the table of observed values for questions 1 and 3; The observed value is calculated by finding out how many respondents from the gender question was males and answered Yes. And writing that in the table as seen below. So, for example, in the table below there are 69 males that answered “yes” that they know what is decentralized finance and 9 males that answered “No” They do not know decentralized finance. And the steps are repeated to get the values for all the other questions. Lastly, the sum of both is added at the end of the table.

	observed Values		
	Yes	No	
Male	69	9	78
Female	30	13	43
	99	22	121

Figure 26 Observed Values for Question 1 and 3

The expected values are calculated by multiplying the row total and column total and dividing it by the overall total. In the first spot, the formula used is $78 \times 99 / 121$. Which will give us 63.81 which is added in the Figure below Figure 27.

And the Expected Values;

	Expected	
	yes	no
male	63.81818	14.18182
female	35.18182	7.818182

Figure 27 Expected Values of Question 1 and 3

After Calculating the observed values, and the expected Values. We can use this information to calculate the Chi Square. Using the formula provided in Figure 28 below. We will be misuing the observed values minus the expected values, squaring it. And dividing the answer by the expected Values.

$$\chi^2 = \sum \frac{(\text{Observed} - \text{Expected})^2}{\text{Expected}}$$

Figure 28 Chi Square Formula

The result after interpreting Figure 26 and Figure 27, using the formula in Figure 28 Would be;

(O-E) ² /E	Yes	No
Male	0.420746	1.893357
Female	0.763214	3.434461

Figure 29 Findings for Question 1 and 3

By adding all the values, as we can see in Figure 29, we get the Chi Square value in Figure 27. Which after dividing it by the DF value, we get the P value. And are now able to test the hypothesis.

		Chi Square;	6.511777
Alpha = 0.05		df	1
		P-value	0.010716
df = (Number of rows-1) * (Number of clumns -1)			

Figure 30 Chi Square Values and alpha

After finding out the P-value of 0.010716, it is now time to compare it with the alpha value. Where we will be able to either accept or reject our hypothesis created.

And since **the P value for Question 1 and 3 is 0.0107. And is less than the alpha value of 0.05, therefore the null hypothesis is rejected, and the alternative hypothesis is accepted. Therefore, there is association between Gender and whether they know decentralized finance or not.**

Chi Square Analysis 2; To find if there is relationship between the gender, and whether they conducted a decentralized finance transaction in the past 2 years. The Null Hypothesis is that there is no association between gender and using decentralized finance, while the alternative hypothesis is that there is association between gender and using decentralized finance.

Null Hypothesis; There is no association between gender and using decentralized finance in the past 2 years.									
Alternative hypothesis; There is association between gender and using decentralized finance in the past 2 years.									

Figure 31 Hypothesis for Question 1 and 5

We will use the same steps used in analyzing the previous Chi Square test.

if $p > 0.05$, you should accept the null hypothesis and reject the alternative hypothesis.
if $p < 0.05$, you should reject the null hypothesis and accept the alternative hypothesis

Figure 32 P-Value for the Chi Square test

Observed Values;

	Observed Values			
	Yes	No		
Male	36	42	78	
Female	16	28	44	
	52	70	122	

Figure 33 Observed Values for question 1 and 5

Theoretical Values;

	Theoretical Values	
	Yes	No
Male	33.245902	44.7541
Female	18.754098	25.2459

Figure 34 Theoretical Values of Question 1 and 5

Formula Used;

$(O-E)^2/E$	Yes	No
Male	0.22815	0.169483
Female	0.404448	0.300447

Figure 35 Findings for question 1 and 5

Findings;

Alpha = 0.05	Chi square	1.102528
	df	1
	P value	0.293712

Figure 36 P-Value for Question 1 and 5

Chi square findings for question 1 and 5;

Since the **P-value** is **0.29** and is more than the **alpha value of 0.05**, therefore the **null hypothesis is accepted**, and the alternative hypothesis is rejected. **Therefore, there is no association between gender and the usage of decentralized finance in the past 2 years.**

Chi Square Analysis 3; to try to see if there is any correlation between the users of decentralized finance, and their trust in banks in their country. We will be analyzing Question 5 and Question 8, And we will be using the same technique used to analyze the previous Chi Square tests.

Hypothesis;

Null Hypothesis; There is no association the usage of decentralized finance and trust in banks.					
Alternative hypothesis; There is association between using decentralized finance and level of trust in banks.					

Figure 37 Hypothesis for Question 5 and Question 8

Observed Data;

		Observed			
					(Trust in banks)
(Transactions done)		Yes	No		
	Yes	30	22		52
	No	35	35		70
		65	57		122

Figure 38 Observed data for Question 5 and 8

Theoretical;

	Theoretical	
	Yes	No
Yes	27.704918	24.29508
No	37.295082	32.70492

Figure 39 Theoretical Data for Question 5 and 8

After Chi-Square Formula;

$(O-E)^2/E$	Yes	No
Yes	0.190125	0.216809
No	0.141236	0.161058

Figure 40 Findings for Question 5 and question 8

P Value;

Alpha 0.05	Chi square results	0.709229
	Degrees of freedom	1
	P-value	0.3997

Figure 41 P-Value for question 5 and question 8

Chi Square test for Question 5 and 8;

Since the P-value is 0.39 and is more than the alpha value of 0.05, therefore the null hypothesis is accepted, and the alternative hypothesis is rejected. Therefore, there is no association between the use of decentralized finance and the trust in banks between university students.

6. Results and discussion

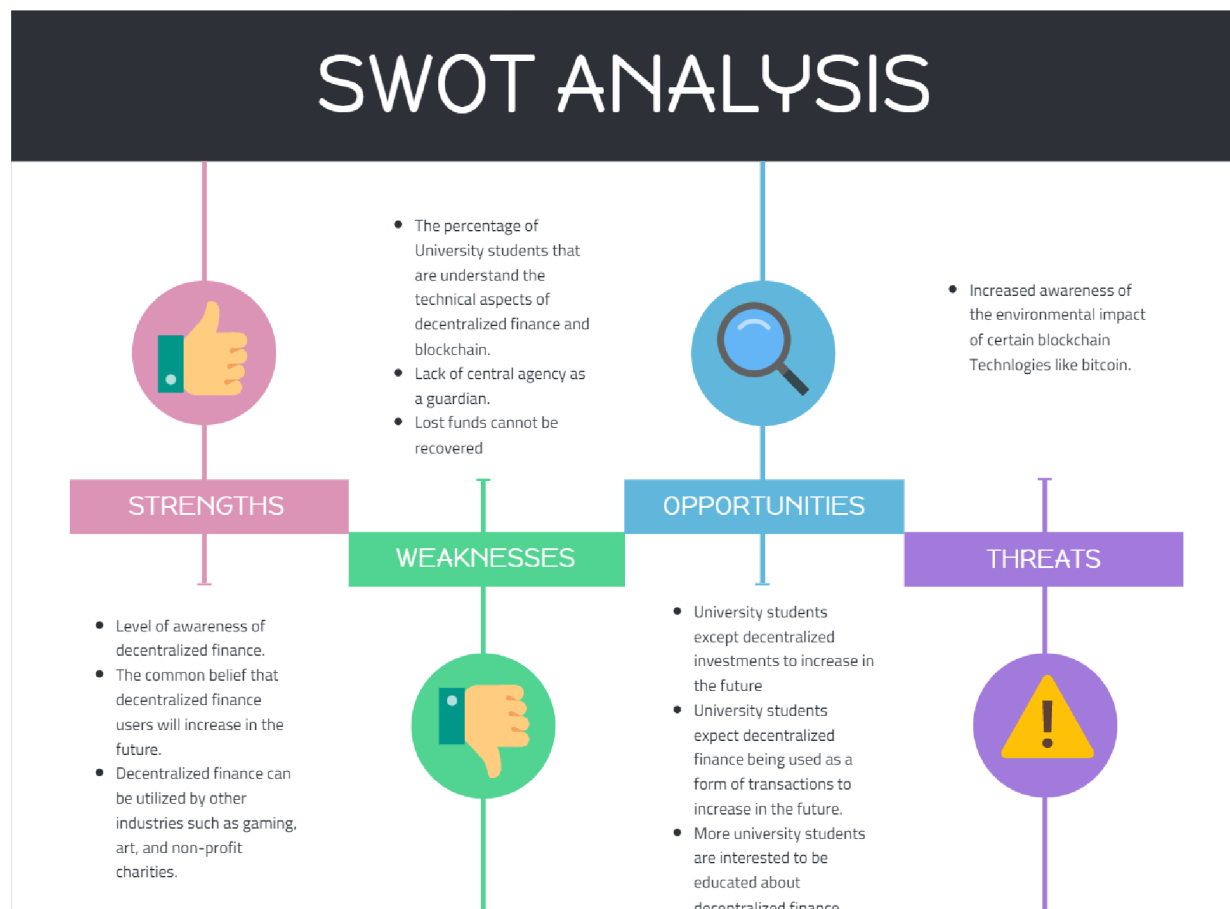


Figure 42 Swot Analysis for research findings (Ibrahim, 2022)

Based on the findings, the researcher believes that there is strong level of awareness and understanding of decentralized finance among university students in Prague. With over 81% of the respondents agreeing that they know what decentralized finance is. However, there is still areas that are missing for decentralized finance to completely substitute traditional finance. While Majority of the respondents confirmed that they know what is decentralized finance, only 12.3% of the respondents confirmed to know decentralized finance very well. With the rest 87.7% still learning about the topic. This shows why the level of adaptation is currently low and barely visible in our economy and day to day economic interactions.

It is also important to understand, that based on the literature review. We can see strong evidence that decentralized finance is only fully utilized when the local financial infrastructure is not functioning, at risk, or is not operating at the benefits of its users. So, for example, decentralized finance was utilized in Ukraine to decrease the bureaucracy required to receive donations, was also used by the Russian population to overcome the national sanctions they

received and to allow them to make international purchases and transfers. And it was also used by the Lebanese people as their country's financial system collapsed. So, as it can be seen from the previous scenarios, populations only tend to fully utilize decentralized finance when their financial system is not operative or is not operating at their best benefits. So, in the case of Prague University students, there is still no need to fully utilize decentralized finance as the Czech Financial system is operating fine for many of its users.

It is also visible that the major University students in Prague currently use decentralized finance as an investment tool. When asked about whether they believe the use of decentralized finance will increase as form of investments, 75% of the respondents responded with yes. And only 25% responded with No. This shows that there is strong believe that decentralized finance as an investment tool will continue to grow in the future.

The Chi Square test analysis has pointed out that there is association between gender, and the awareness of decentralized finance. Which means that generally, Males have higher knowledge about decentralized finance than females. However, there was no correlation between gender and the use of decentralized finance in the past two years. and there was no correlation between the usage of decentralized finance and the trust in the banks.

One of the main challenges for the adaptation level of decentralized finance is currently the educational level of decentralized finance. When asked the respondents on what they believe could increase the adaptation level of decentralized finance, their responses majority focused on increased education about decentralized finance and integrating it with the traditional economy. This means that for decentralized finance to be more utilized and used among the average citizens. More education is required to enhance the integration of this new financial system.

Finally, it is also visible that the consumption level of electricity and electronic waste created by decentralized finance is a major issue as confirmed by the literature review and questionnaires findings. The waste created by decentralized finance and electricity consumed creates a substantial risk on the adoption of decentralized finance. Because while the finances and economies of the country in the world matter, many users also care about the environment and global warming and using decentralized finance may not be the best option when it comes to the environmental aspect.

7. Conclusions

In Conclusion, the provided research was created to investigate the level of adaptation of decentralized finance among university students in Prague. The research started by introducing the aim, research questions and methodology that will be used in the research. Where the aim is to find the level of adaption of decentralized finance among university students in Prague. Followed by introduction about the decentralized finance, and a dive deep to the literature review associated with the topic of decentralized finance. The literature review examined many different aspects of decentralized finance, starting with the origins of decentralized finance, the top 5 coins/tokens, how decentralized finance operates, the total market capitalization of decentralized finance, and how different countries in the world have found benefits using decentralized finance. The findings for the dive deep in literature review is that one of the main challenges for decentralized finance is its electricity consumption and its e-waste generating issue. Where the electricity required to mine a single bitcoin required more energy for a single household for 11 years. And the computing power required to mine a single bitcoin keeps increasing over years, creating more electronic waste for future generations which are hard to recycle. However, the advantage of decentralized finance is that it was a good substitute to traditional financial system in many different countries for different reasons. Decentralized finance was utilized in Ukraine to attract more donations to the country during its occupation war with Russia. Increasing the speed of receiving the donations and its anonymity. Decentralized finance was also used as a mean of exchange of goods in Lebanon as the Lebanese government was corrupted and forced to file for insolvency after losing its citizens funds. Decentralized finance helped support the Lebanese people to still be able to conduct financial transactions both locally in Lebanon and internationally. Where otherwise they would have to completely rely on the Lebanese financial system which collapsed.

The other section of the research was dedicated to presenting and analyzing the data collected from questionnaires. The Questionnaire was answered by 122 students in different Prague universities. The questionnaire asked the students 12 different questions that would help assess their level of adaptation towards decentralized finance. The findings were that majority of university students do know what decentralized finance. And that over 46% of the university students have done a decentralized finance transaction in the past 2 years. And over 75% of university students in Prague believe that the trend of using decentralized finance as a form of investments and a mean of exchanging goods will increase in the upcoming years. Furthermore,

Majority of the students in Prague think that the waste created from decentralized finance and electricity consumed is its main disadvantage.

As it can be seen from the research created above, decentralized finance has many advantages and disadvantages. And if the reader is wondering why decentralized finance is not used as a mean of exchange of goods and services in Prague, Czech Republic. It is because the Czech financial system is currently functioning healthy. So, there is no reason for Czech students/ citizens or population to look for substitute mean of exchanging goods. So, they prefer to use decentralized finance as an investment tool. As the financial gains from decentralized finance have proven to provide much larger percentage of return rather than traditional stocks or bonds. However, the risk is also increased.

8. References

Born, A. et al. (2022) Decentralised finance – a new unregulated non-bank system?, European Central Bank. Available at: https://www.ecb.europa.eu/pub/financial-stability/macprudential-bulletin/focus/2022/html/ecb.mpbu202207_focus1.en.html

(Accessed: October 21, 2022).

CoinMarketCap Bitcoin price Today, BTC to USD live, marketcap and Chart (2022) CoinMarketCap. Available at: <https://coinmarketcap.com/currencies/bitcoin/> (Accessed: October 13, 2022).

Crypto market cap charts (2022) CoinGecko. Available at: <https://www.coingecko.com/en/global-charts#:~:text=The%20global%20cryptocurrency%20market%20cap,a%20Bitcoin%20dominance%20of%2038.57%25> (Accessed: October 11, 2022).

Dermarkar, S. and Hazgui, M. (2022) How the Russia-Ukraine conflict has put cryptocurrencies in the spotlight, The Conversation. Available at: <https://theconversation.com/how-the-russia-ukraine-conflict-has-put-cryptocurrencies-in-the-spotlight-180527> (Accessed: October 12, 2022).

Frankenfield, J. (2022) Binance coin (BNB) uses, support, and market cap, Investopedia. Investopedia. Available at: [https://www.investopedia.com/terms/b/binance-coin-bnb.asp#:~:text=Investopedia%20%2F%20Madelyn%20Goodnight-,What%20Is%20Binance%20Coin%20\(BNB\)%3F,a%20volume%20of%20%247.6%20billion](https://www.investopedia.com/terms/b/binance-coin-bnb.asp#:~:text=Investopedia%20%2F%20Madelyn%20Goodnight-,What%20Is%20Binance%20Coin%20(BNB)%3F,a%20volume%20of%20%247.6%20billion)

(Accessed: October 21, 2022).

Frankenfield, J. (2022) Gas (ethereum): How gas fees work on the ethereum blockchain, Investopedia. Investopedia. Available at: <https://www.investopedia.com/terms/g/gas-ethereum.asp> (Accessed: October 21, 2022).

Frankenfield, J. (2022) Gas (ethereum): How gas fees work on the ethereum blockchain, Investopedia. Investopedia. Available at: <https://www.investopedia.com/terms/g/gas-ethereum.asp> (Accessed: October 21, 2022).

Frankenfield, J. (2022) Gas (ethereum): How gas fees work on the ethereum blockchain, Investopedia. Investopedia. Available at: <https://www.investopedia.com/terms/g/gas-ethereum.asp> (Accessed: October 21, 2022).

Hayes, A. (2022) Chi-Square (X²) statistic: What it is, examples, how and when to use the test, Investopedia. Investopedia. Available at: <https://www.investopedia.com/terms/c/chi-square-statistic.asp> (Accessed: November 13, 2022).

Hicks, C. (2022) What is USD coin? how does it work?, Forbes. Forbes Magazine. Available at: <https://www.forbes.com/advisor/investing/cryptocurrency/usd-coin/> (Accessed: October 21, 2022).

Hong, E. (2022) How does bitcoin mining work? what is crypto mining?, Investopedia. Available at: <https://www.investopedia.com/tech/how-does-bitcoin-mining-work/> (Accessed: October 12, 2022).

Huang, J., O'neill, C. and Tabuchi, H. (2021) Bitcoin uses more electricity than many countries. how is that possible?, The New York Times. The New York Times. Available at: <https://www.nytimes.com/interactive/2021/09/03/climate/bitcoin-carbon-footprint-electricity.html> (Accessed: October 11, 2022).

Kumar, H. (2022) Demystified: The difference between crypto coins and crypto tokens. read here for details, <https://www.outlookindia.com/>. Available at: [https://www.outlookindia.com/business/demystified-the-difference-between-crypto-coins-and-crypto-tokens-read-here-for-details-news-197683#:~:text=The%20crypto%20industry%20has%20said,top%20of%20an%20existing%20Blockchain](https://www.outlookindia.com/business/demystified-the-difference-between-crypto-coins-and-crypto-tokens-read-here-for-details-news-197683#:~:text=The%20crypto%20industry%20has%20said,top%20of%20an%20existing%20Blockchain.). (Accessed: October 12, 2022).

POPESCU, O.V.I.D.I.U. (2021) The Story Behind Decentralized Finance (DEFI), Trality Blog. Available at: <https://www.trality.com/blog/decentralized-finance> (Accessed: October 12, 2022).

Reuters (2021) Lebanon currency drops to new low as financial meltdown deepens, Reuters. Thomson Reuters. Available at: <https://www.reuters.com/world/middle-east/lebanon-currency-drops-new-low-financial-meltdown-deepens-2021-06-13/> (Accessed: October 11, 2022).

Reuters (2022) Factbox: Just how bad is Lebanon's economic crisis?, Reuters. Thomson Reuters. Available at: <https://www.reuters.com/world/middle-east/just-how-bad-is-lebanons-economic-crisis-2022-09-14/> (Accessed: November 15, 2022).

Sabaghi, D. (2022) Lebanese exchange rate chaos causes economic hardship – DW – 10/13/2022, dw.com. Deutsche Welle. Available at: <https://www.dw.com/en/lebanons-currency-crisis-new-exchange-rate-policy-to-cause-massive-hardship/a-63420096> (Accessed: November 9, 2022).

Saunders, M., Lewis, P. and Thornhill, A. (2015) Research methods for business students PDF Ebook, Google. Google. Available at: https://books.google.cz/books/about/Research_Methods_for_Business_Students_P.html?id=vUdOCgAAQBAJ&redir_esc=y (Accessed: November 15, 2022).

Sigalos, M.K. (2022) In bankrupt Lebanon, locals mine bitcoin and buy groceries with tether, as \$1 is now worth 15 cents, CNBC. CNBC. Available at: <https://www.cnbc.com/2022/11/05/-in-bankrupt-lebanon-locals-mine-bitcoin-and-buy-groceries-with-tether.html> (Accessed: November 9, 2022).

Statista (2022) Frankfurt Stock Exchange: Market cap 2022 (2022) Statista. Available at: <https://www.statista.com/statistics/1203216/frankfurt-stock-exchange-market-cap/> (Accessed: October 21, 2022).

Stevens, M. (2022) These countries at risk of a deep economic crisis, NDTV.com. NDTV Profit. Available at: <https://www.ndtv.com/business/not-just-sri-lanka-more-countries-risk-economic-crisis-on-rampant-dollar-3165466> (Accessed: November 9, 2022).

Tardi, C. (2022) Understanding the different types of cryptocurrency, SoFi. SoFi. Available at: <https://www.sofi.com/learn/content/understanding-the-different-types-of-cryptocurrency/> (Accessed: October 12, 2022).

9. Figures References

Figure 1;

Questionnaire Cover page, Created by the researcher (Ibrahim,2022).

Figure 2;

Scott, M. (2022) New Era in technology: Blockchain Traceability, VISIOTT. Available at: <https://www.visiott.com/blog/blockchain-traceability/> (Accessed: November 6, 2022).

Figure 3;

Coingecko (2022) Crypto market cap charts, CoinGecko. Available at: <https://www.coingecko.com/en/global-charts#:~:text=The%20global%20cryptocurrency%20market%20cap,a%20Bitcoin%20dominance%20of%2037.16%25.> (Accessed: November 9, 2022).

Figure 4;

Ukraine Twitter (2022) Stand with the people of Ukraine. now accepting cryptocurrency donations. bitcoin, Ethereum and USDT.BTC - 357a3So9CbsNfBBgFYACGvxxS6tMaDoa1PETH and USDT (ERC-20) - 0x165cd37b4c644c2921454429e7f9358d18a45e14, Twitter. Twitter. Available at: <https://twitter.com/ukraine/status/1497594592438497282> (Accessed: November 5, 2022).

Figure 5;

ojogabonitoo (2018) Bitcoin Mining Illustration, IstockImages. IstockImages. Available at: <https://www.istockphoto.com/cs/vektor/podnikatel-kopaj%C3%ADc%C3%AD-bitcoiny-ve-sk%C3%A1le-gm1029138478-275819711> (Accessed: November 4, 2022).

Figure 6;

Gupta, A. (2021) Bitcoin uses more electricity than many countries. how is that possible? – EQ Mag Pro, The Leading Solar Magazine In India. Available at: <https://www.eqmagpro.com/bitcoin-uses-more-electricity-than-many-countries-how-is-that-possible-eq-mag-pro/> (Accessed: November 4, 2022).

Figure 7;

Digiconomist (2021) Bitcoin electronic waste monitor, Digiconomist. Available at: <https://digiconomist.net/bitcoin-electronic-waste-monitor/> (Accessed: November 12, 2022).

Figures 8 to 24;

Questionnaire data findings Analysis, Created by the researcher (Ibrahim,2022).

Figure 25 to 41;

Chi Square Analysis for questionnaires, Created by the researcher (Ibrahim,2022)

Figure 42

Research findings SWOT Analysis. Created by the researcher (Ibrahim,2022).