

## CRYPTOCURRENCIES: THE RISE OF A FUTURISTIC CURRENCY

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### Abstract

The 21st century represents the greatest revolution humans have had since its creation. The pillars on which the era of new technology will be built have been laid. Many innovations have been created, starting from smartphones, VR gadgets, and smart devices that find use at home, such as smart TVs or smart fridges, where all these innovations have replaced their predecessors, who possessed weaker technology and far weaker features than the latest technology has. Despite the fact that almost all aspects of human life are being fulfilled with new age technology, there is still an item which was initially said to have been used 5000 years BC and continues to have the same use to this day. That item is money. Despite the changes that have taken place over the centuries, the system of coins and money has not changed for any reason and at any moment, and the same continues to be used today. But that does not mean it will not change. The archenemy of money in terms of new technology, which has the potential to replace it, is known as cryptocurrency. In this paper, an elaboration on the blockchain was given, the database on which all cryptocurrencies are created. In terms of cryptocurrencies, the focus was mainly on bitcoin and Ethereum as the two most successful currencies. Also, a survey on Google Forms about cryptocurrencies was concluded, and the paper was closed with a conclusion about the survey and cryptocurrencies overall.

*Keywords:* cryptocurrency, blockchain, bitcoin, Ethereum.

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### 1. Introduction

In late 2007 and early 2008, the world faced the greatest economic crisis since the time of the Great Depression, known as the Global Economic Crisis. The rise of mortgages on real estate and houses led to the bankruptcy of a US mortgage company, Lehman Brothers. This event had a chain reaction, leading to a global crisis at the World Bank.

All these chain accidents brought the creation of a new "currency", a virtual currency, known today as cryptocurrency. Cryptocurrencies are digital money with the unique feature of being decentralized, which means that their value cannot be controlled by the World Bank or a state government. It operates independently, providing high security for transactions. Cryptocurrency security comes from cryptography, where the latter prevents a third party from disturbing a transaction or a payment.

The first cryptocurrency, which at this time has more value than all other cryptocurrencies, is bitcoin. This currency ushers in a new era of technology by modernizing traditional currencies while also introducing blockchain.

Blockchain would revolutionize the second decade of the twenty-first century, appearing in a variety of fields other than information technology. Starting from video games, peer-to-peer energy trading, and up to assisting the supply chain of a company, blockchain has laid its roots, and it's our duty to consume the services it can offer.

As said earlier, cryptocurrencies are decentralized. This aspect can cause headaches for a certain individual. The problem stands in the fact that when a payment is made using a cryptocurrency, whether it's Bitcoin or Ethereum, there is no way of turning that back or canceling it, meaning it's irreversible. As long as a

cryptocurrency becomes part of a certain block, it's nearly impossible to turn it back. It is also worth mentioning that transactions using cryptocurrencies are distributed on the blockchain, meaning that every participant can see the transaction but cannot change it. Being said, the aspect of payments being irreversible and visible can be described as a knife with 2 blades:

- 1) It hinders the growth of using digital currencies, because not all people like the idea of them being monitored or their transactions being visible.
- 2) Prevents, but does not stop malicious transactions, such as transactions on the Dark Web.

## 2. Blockchain, Bitcoin and Ethereum

To comprehend digital money, first comprehend the technology that cryptocurrencies are based on must be comprehended. Although "blockchain" has already been stated, now is the time to provide a more complete and comprehensive explanation. A blockchain is nothing more than a database. Data is written first, then saved. But why is blockchain being used instead of a database like MSSQL, Oracle, or MySQL?

There are plenty of reasons why The Creator implemented a new database and didn't use an existing one. The data stored on a classic database can be controlled by an entity, so it can be changed depending on how the owner wants it. On a blockchain, the data stored cannot be altered. Once it's written, it cannot be undone. Also, when a transaction is completed on a blockchain, the information and data about that transaction is distributed on all the blockchain nodes, so everyone who has access to the blockchain can see it [1].

Even though Satoshi Nakamoto is known as the sole creator of blockchain, its fundamental idea dates back to the 90s. Stuart Haber and W. Scott Stornetta had a goal: they wanted to make a system with immutable timestamps for a document. They were successful and immediately started their own company, which operates to this day. In his paper about Bitcoin, Satoshi Nakamoto cites the work of Stuart Haber and W. Scott Stornetta. At first glance, blockchain may seem a little bit complicated, but it's not. To understand it, you just need to know the basic functions of a database. The main goal of a database is to store a large amount of data that can be accessed by a large group of people. On a classic database, data is stored on a set of 8 Kb inside of the database, while on a blockchain, data is stored in a group. These groups are known as "blocks." Every block contains a specific amount of data. When a block is filled with data and cannot store more, a new block is created. This new block is linked with its predecessor block by a "chain". When the latest block is filled with data and we cannot store more, a new block is created and linked again with its predecessor, and we continue to store data on the newest block. This goes on and on. Another characteristic of blockchain is the timeline. A timeline occurs when a block is filled with data and is linked with its successor. At this moment, a time stamp is created, which marks the exact time when this block was put on the chain. The Genesis Block, or Block 0, is the first created block. After 6 days, Block 1 was created, and this marks the start of the blockchain [2].

*2.1. Decentralization:* It refers to the transfer of control from a centralized entity to a distributed network. We shall know that decentralization as a concept was not proposed altogether with the creation of the blockchain. It existed earlier. When we create a new technology or an application, we should choose which architecture we will use. There are 3 types of architecture: centralized, decentralized, and distributed. In a decentralized architecture, performance and security depend directly on the number of people on that network. Security increases if the number of people increases, but performance slowly degrades when the number of people increases [3].

*2.2. Security:* Blockchain has probably the highest level of security. This comes from the ability of the blockchain to be irreversible. Since its creation until now, there have been approximately 700,000 blocks on the blockchain. Each block contains its own timestamp and unique hash. A hash is a mathematical function that converts digital information into combined strings of numbers and letters. When someone tries to change

the hash and goes on the oldest blocks, the combination of the hashes changes, making it impossible to go back. Maybe the only anomaly that blockchain has is the 51% Attack Syndrome. With this method, the attacker needs to control more than 51% of the blocks on the blockchain. Given the fact that there are approximately 700,000 blocks, it's nearly impossible for this to work [3].

*2.3. Bitcoin:* When someone mentions cryptocurrency, the first thing that comes to mind is bitcoin. Some even refer to all cryptocurrencies as bitcoins. But what exactly is bitcoin? It's just a piece of software and a set of protocols. Its primary goal was to facilitate transactions. Person X makes a purchase from Person Y. The payment is paid in bitcoin, and the transaction data is recorded on the blockchain. That's all there is to it [4]. Bitcoin and cryptocurrencies have been discussed, but how does one obtain a cryptocurrency? You can do so in one of two ways: "mine" it or buy it on an exchange platform like Coinbase or Binance. Mining bitcoin entails performing some chores on a computer with a lot of processing power and solving hard mathematical problems. A new bitcoin has been created if you succeed with it. Up until today, there were around 18 million bitcoins on the market. The creator decided to implement halving because the rate of mining was so high and there could only be 21 million bitcoins. Halving reduces the rate of mining from which bitcoin is created. A new bitcoin will be mined when 210000 blocks are filled with data, or every 4 years. The last bitcoin is expected to be mined around the year 2140 [3].

Fun fact: El Salvador was the first country to adopt bitcoin as a legal tender [5].

*2.4. Ethereum:* It is the second most valuable cryptocurrency, following Bitcoin. It's an open-source and decentralized cryptocurrency. There was an idea to develop a new version of Ethereum known as Ethereum 2.0, which was also known as Serenity. Right now, Ethereum (eth1) and Ethereum 2.0 (eth2) are merged, and there will be only Ethereum. Eth1 is the "execution layer" which handles transactions and data, whereas Eth2 is the "consensus layer" which handles proof-to-stake consensus [6].

### **3. Study Case**

A survey was conducted in order to get a clear picture of how many cryptocurrencies are in use in North Macedonia. The survey was formulated on Google Forms and it was completely anonymous for research purposes. People of different ages were targeted, from 20-year-olds to 60-year-olds. From all the responses, none of them were removed because they were all done in the correct manner, which helped in achieving a conclusion about this topic.

The survey consisted of 11 questions, of which 2 of them were demographic questions. Hereinafter, we will give a clear overview of the survey.

#### **Q1. Gender**

The first demographic question was based on gender. 58% of the respondents were male, whereas 42% were female. The number of male and female respondents was balanced in order to get a better picture of the usage of crypto-currencies based on gender.

#### **Q2. Age**

The following question regarded the respondents' age: A total of four age groups were created, with the first age group being from 20 to 29. The second age group was 30–39. The third was from 40-49, and lastly, from 50-59. The majority of the respondents were from the first age group, with 54% of respondents. The second age group had a total of 24%, the third age group had 18%, and the last age group only concluded with 4%.

After demographic questions, a section where an explanation of cryptocurrencies was given, and then the questions about cryptocurrencies followed.

**Q3.** How much, if at all, have you heard or read about cryptocurrencies such as Bitcoin or Ethereum?

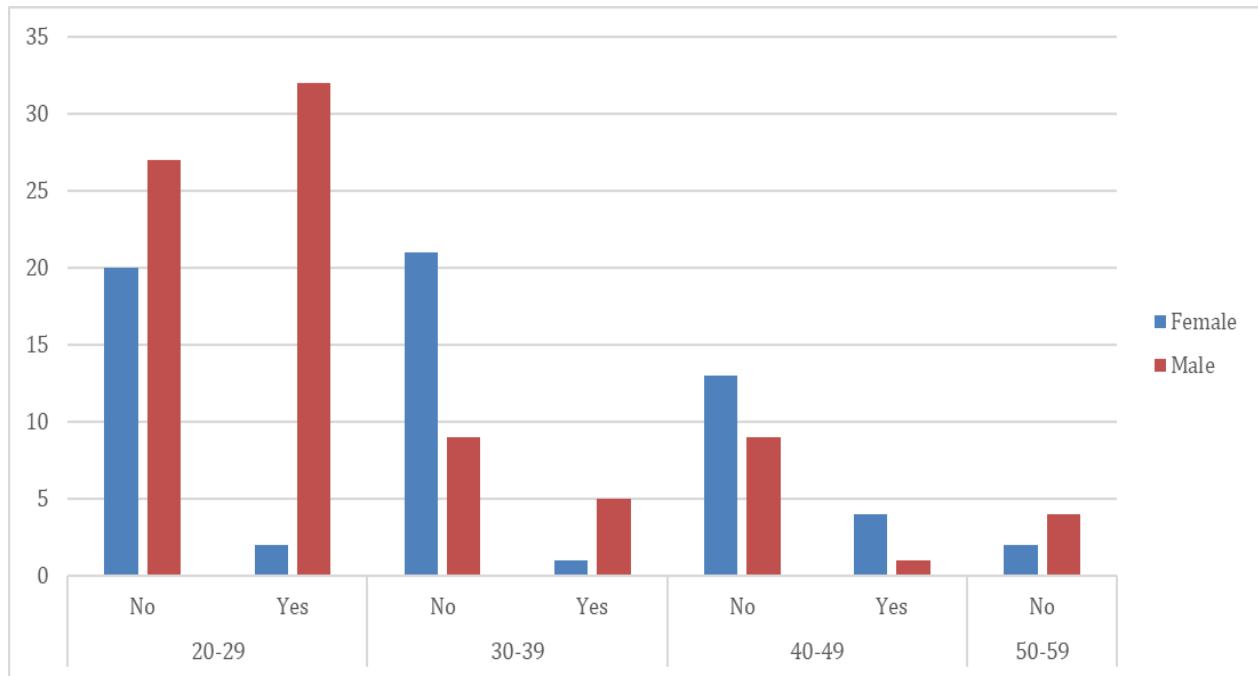
On the next question, respondents were asked if they knew something about cryptocurrencies. The results were as expected. 33.3% of the respondents knew or had heard a lot about cryptocurrencies, while 5.3% of them had just heard about cryptocurrencies in our survey. The respondents that had never heard about cryptocurrencies before were from the last age group, which is not unexpected. The most unexpected case was that a respondent from the first group age had never heard of cryptocurrencies before, which was weird. This can be as a result of many factors, such as not using social media, a field of study that has nothing to do with technology, or any private reason.

**Q4.** Do you think cryptocurrencies will replace traditional currencies?

The following question was if the respondents think that cryptocurrencies are going to replace classic currency. 26% of the respondents were optimistic and thought that this may happen. 52.7% of them were hesitant, 15.3% said that this wouldn't happen, and the remaining 6% had no idea what would happen. The minority that had no idea what would happen were the respondents who had never heard about cryptocurrencies before, including one who claimed to know a lot about cryptocurrencies.

**Q5.** Do you own cryptocurrency?

The main question on the questionnaire was the following: Do you own cryptocurrency? Depending on the number of respondents, a large number of them, 30% were owners of a cryptocurrency, while 70% did not own any kind of cryptocurrency. This was a surprising number considering the number of people included in the survey. Even though the gender percentage was nearly similar, males had five times more cryptocurrency in their possession compared to females. 44% of male respondents had cryptocurrencies, while only 11% of females were owners of cryptocurrencies. Based on the answer given to the fifth question, a condition was put in, so if the answer was No, the survey would end and vice-versa.



**Fig 1.** A column chart grouping the respondents by age and gender and showing which age groups and gender have more cryptocurrency

A cross-statistic column was created in Figure 1 to indicate how many respondents possess cryptocurrency based on gender and age. Males in the first age group have significantly more cryptocurrencies than the others, whilst no one in the last age group possesses any cryptocurrency.

**Q6.** How likely are you to invest in cryptocurrencies in five years?

Following the prerequisite, the next question was: "How likely are you to invest in cryptocurrencies in five years?" Of the five choices the respondents had, a majority of them said that they are extremely likely to invest in cryptocurrency, and none of the participants said that they won't invest in cryptocurrency.

**Q7.** What is the main reason you bought cryptocurrencies?

The seventh question, except for the two choices that were given, also had an open option where the participants could write their thoughts on why they bought cryptocurrencies. 52.2% of the participants invested in cryptocurrencies based on internet speculation that their value would go "to the moon", while 23.9% of them wanted freedom from banks. As for open answers, they are listed below:

- I think it's a good investment.
- Profit.
- Revolutionary use cases for blockchain.
- I invested very early, mainly as a payment method to sell digital items but also believed it
- Would become something big in the future (which we see coming...).
- Some cryptocurrencies provide anonymity, also faster transactions for payments. "To the Moon" is not something I hold cryptos for.
- Another way to transfer money. Seems more efficient.
- I think they are good stocks to invest in.

- I bought crypto early without any reason and somehow, I got profit from it.
- I bought Ethereum as a joke with a friend when it was like 2 euros, and we didn't trade it.
- Now it's like 2500 euro and we have a good profit.
- I wanted to make easy money.
- Make money without work-I put a small amount of money just to try it, maybe I have luck and profit.

**Q8.** Do you think cryptocurrency will be worth more or less in five years?

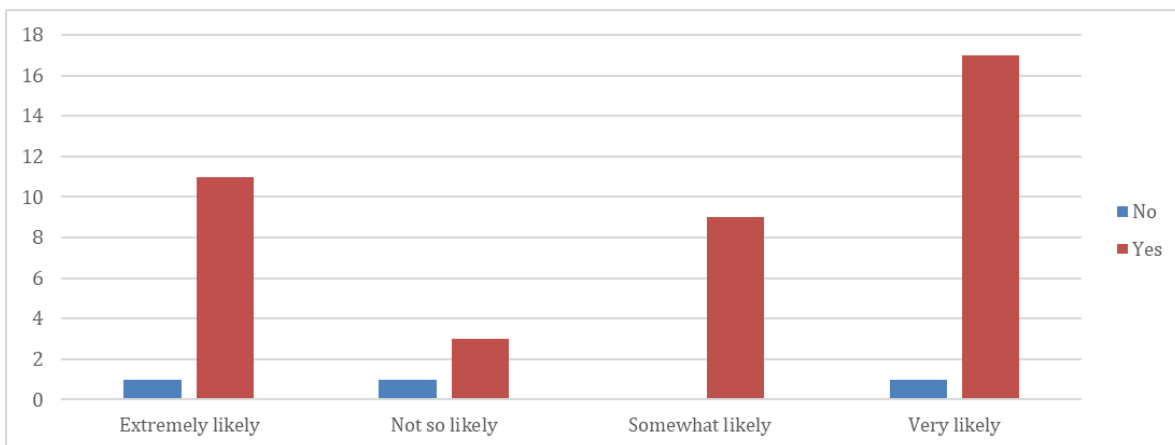
The next question was, if in an interval of five years, do they think that cryptocurrencies will be worth more or less than today? More than half of the respondents, 54.3% to be precise, believed that cryptocurrencies would be worth more than today. Only one of them was pessimistic, and they think that the value will be less than today. Based on our research and perspective, we think that in an interval of 5 years, only some cryptocurrencies will be 1.5 or 2 times more than today, while others will suffer a market crash and their prices will drastically fall.

**Q9.** In the case of cryptocurrencies, do you trust their technology for the long term?

The ninth question was whether participants trusted the technology on which cryptocurrency was built. The majority of the participants trusted the technology. 8.7% of the respondents did not trust it, while 15.2% had opinions on whether to trust or not to trust the technology. Based on the security of blockchain, we think that people that do not trust this technology probably have never heard of it, or they haven't studied blockchain so that they can know its security. Even though blockchain is not immune to hacking, we believe that it's the most secure technology we have right now.

**Q10.** Do you think cryptocurrencies can co-exist in our daily lives?

The penultimate question was if the respondents thought that cryptocurrencies could co-exist in our daily lives. A majority of the respondents thought that cryptocurrencies can co-exist in our daily lives, while 6.5% of them thought that this won't and will never happen. Based on investments that are made in cryptocurrencies every day and on El Salvador's status as the first country that accepted cryptocurrencies as legal tender, it's very likely that cryptocurrencies can co-exist in our daily lives.

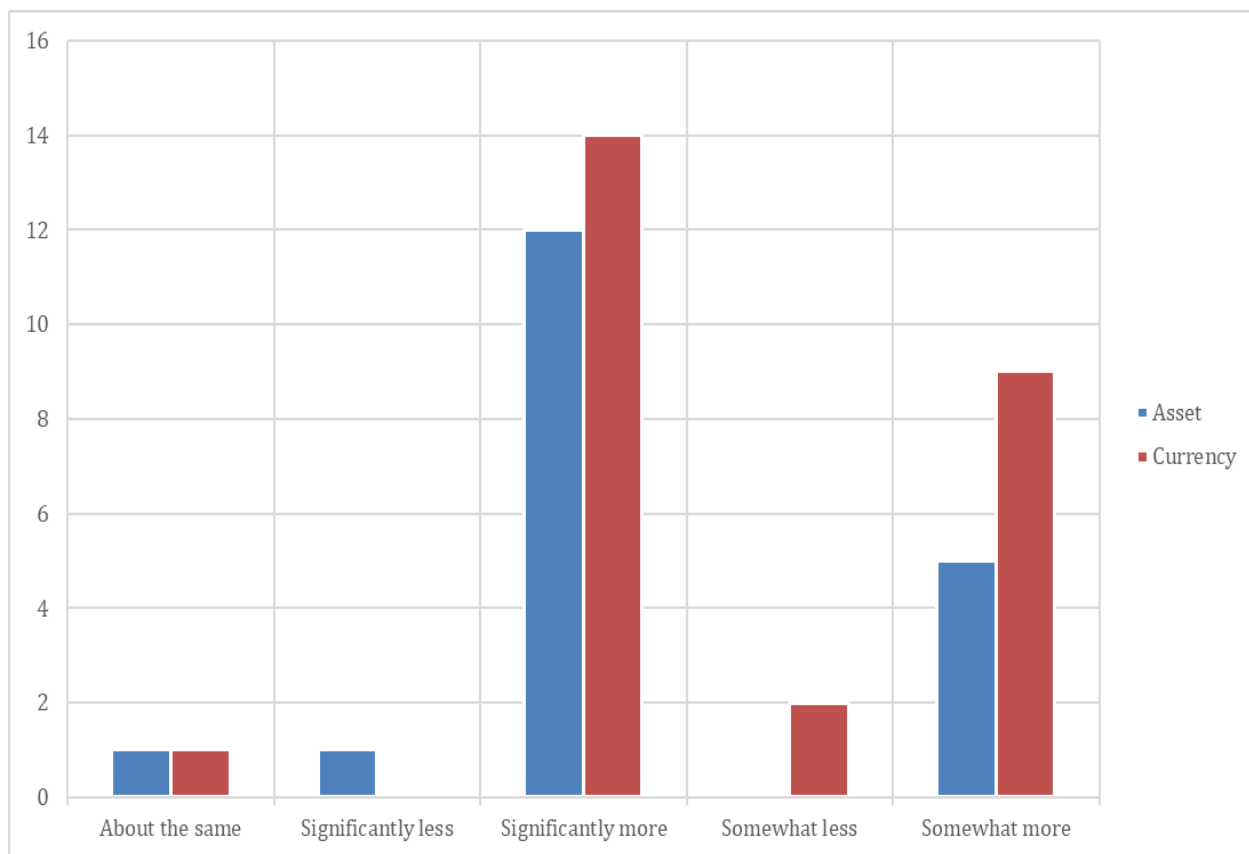


**Fig 2.** A cross-statistic column chart between Q6 and Q10

Figure 2 is also a cross-statistic chart between Q6 and Q10. The reason why these two questions are chosen is to show how much people are trusting cryptocurrency in the future tense. For example, it can be seen that even people who are not so likely to invest in cryptocurrencies in five years believe that digital money can coexist in our daily lives. This means that their minds can change and they can invest in cryptocurrencies for many different reasons. Starting from the fact that you can now open a Visa Card with cryptocurrencies with which you can pay nearly everywhere with 0% interest, it is clear that cryptocurrencies will undoubtedly be part of everyone's lives.

**Q11.** Finally, do you consider cryptocurrencies a currency or an asset?

The last question was whether the respondents considered cryptocurrencies as currency or assets. 58.7% of the respondents considered them as a currency, while 41.3% considered them an asset. From our point of view, at this moment, we should consider them as an asset because their value can move up and down every day. If cryptocurrencies could have a regulated value like current currencies, then they could maybe be considered as a currency.



**Fig 3.** A cross-statistic column chart between Q8 and Q11

As for the last question, another cross-statistic column chart was made between question eight and question eleven. These two questions are chosen to show how the respondents treat cryptocurrencies and, based on how they treat them, to have an idea of whether they think they will be more or less in value. From the chart, it can be seen that some half of the respondents are treating them as a currency, and the majority of them think that they will be more in five years. Based on the current market status, where the cryptocurrency market crashed

because of worldwide events, it is expected that cryptocurrencies will be less in value than they were, but in a short period of time, some special cryptocurrencies will have a rise in value.

#### **4. Conclusions**

From the results obtained from the questionnaire, it can be concluded that people in North Macedonia are still in the initial stage as it pertains to cryptocurrencies, even though they have been in the market for more than ten years. Older people are hardly or barely informed about cryptocurrencies, while younger people, given the fact that they use social media every day and, according to the analysis of the questionnaire, are well informed about cryptocurrencies and tend to invest in them for many different reasons. In a span of five to ten years, it is expected that the number of people that own a digital wallet or have a cryptocurrency in possession in the Polog region will be much higher than it is today.

As for blockchain and cryptocurrencies, right after the Internet, they could be the best technology ever created and for so many reasons. Blockchain represents a revolution in terms of storing data across blocks as opposed to classical databases, and this provides an additional level of security. Another characteristic of blockchain is that it offers immutability. As for cryptocurrency, it is expected that in the near future, it will be the preferred method of making online transactions. But bear in mind that different occasions may cause a crash in the market. For example, right now, the war between Russia and Ukraine has had a major impact on the cryptocurrency market, where nearly all cryptocurrencies are at minus 50% of their original price. Also this week, a reliable cryptocurrency known as Luna experienced a major crash, resulting in the currency losing 100% of its value.

Some people view cryptocurrencies as an opportunity to start a business in order to make money. Some people like them because they are decentralized, while others like them because of the technology on which cryptocurrencies are built. Undoubtedly, cryptocurrencies are more than people think they are, and they are here to stay. Transactions and future commerce will be completely digitized, which will seal the fact that cryptocurrencies will be an integral part of people's lives, thus being introduced into every aspect of human lives.

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