

iscte

INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Revisiting the Impact of Cryptocurrency in Our Society

David Lucas Faria

Master in Management of Services and Technology

Supervisor:

Prof. Nelson José dos Santos António

Full Professor at Department of Marketing, Operations and General
Management

ISCTE Business School

November, 2020



**BUSINESS
SCHOOL**

Department of Marketing, Operations and General Management

Revisiting the Impact of Cryptocurrency in Our Society

David Lucas Faria

Master in Management of Services and Technology

Supervisor:

Prof. Nelson José dos Santos António

Full Professor at Department of Marketing, Operations and General
Management

ISCTE Business School

November, 2020

ACKNOWLEDGEMENTS

The conclusion of this dissertation completes the extended effort made through the whole process of this Master of Science. It was a long procedure, however I was very lucky to have the help of many individuals throughout the whole experience. I would like to thank my supervisor, who supported me through every chapter of this dissertation and helped me to have an organized structure, in the full length of the document.

In addition, I would also like to thank my family for all the support they gave me in all the steps of my education, culminating in this moment, the end of my academic journey, it would not have been possible without their encouragement.

A special thanks to the subjects that participated in the qualitative analysis, that were always available when needed and finally, I would also like to thank my friends inside and outside of the academic environment, that accompanied me throughout all these years.

RESUMO

Atualmente, a Criptomoeda não apresenta nem nunca apresentou um papel preponderante na nossa sociedade, apesar de toda a especulação à sua volta que tem vindo a aumentar consistentemente ao longo dos anos. A evolução desta moeda deve-se a toda a realidade económica vivida nos últimos anos no mundo. A Criptomoeda surgiu em 2008, semanas depois do “crash” económico despontar, com um e-mail enviado por Satoshi Nakamoto apresentando um programa de computadores ofuscante, um algoritmo chamado Bitcoin (Varoufakis, 2019). Ao contrário de todas as outras moedas presentes na nossa sociedade, as criptomoedas apresentam um crescimento ao longo da última década, não perdeu valor com as presentes crises, muito devido ao fato de não serem controladas por nenhuma entidade central como governos ou bancos.

Com a finalidade das moedas virtuais continuarem a ganhar importância no nosso mundo, é necessário que as empresas comecem a adotar esta inovação e a implementá-la na sua estrutura de negócio. Acompanhando esta ideia, é também necessário o consumidor final ter a mente aberta e entreadada essencial para a implementação deste processo.

O principal objetivo desta dissertação passa pela exposição do impacto que as criptomoedas têm e que poderão vir a ter no futuro para o nosso quotidiano, tendo em conta que foram identificadas várias potencialidades nesta inovação que poderão vir a melhorar a qualidade de vida das pessoas.

Palavras Chave: criptomoeda, inovação, estrutura de negócio, qualidade de vida.

ABSTRACT

Currently, cryptocurrency does not present and never has presented any preponderant role in our society, despite all the speculation it had around that has been consistently growing over the years. The evolution of this coin is due to the economic reality lived in the last years on the world. Cryptocurrency appeared in 2008, weeks after the economic crash emerge, with an e-mail sent by Satoshi Nakamoto presenting a dazzling computer program, an algorithm called Bitcoin (Varoufakis, 2019). Unlike any other coin existent in our society, cryptocurrencies exhibit a growth throughout the last decade, it has not lost value with the current crises, mostly because they are not controlled by any central entity like governments or banks.

With the goal to make virtual coins keep gaining more importance in our world, it is mandatory for companies to start adopting this innovation and to implement them in their business strategy. Following this, it is also needed for the final consumer to be open minded and have the necessary awareness to complete the implementation of this process.

The main goal of this dissertation is to reveal the impact cryptocurrencies have now and may have in the future of our quotidian, taking into consideration that many potentials for the improvement of our life quality were identified in this innovation.

Keywords: cryptocurrency, innovation, business strategy, life quality.

CONTENTS

ACKNOWLEDGEMENTSI
RESUMO III
ABSTRACT V
CONTENTSVII
LIST OF FIGURES IX
LIST OF TABLES XI
1. INTRODUCTION 1
 1.1. SCHEDULE 3
 1.2. DISSERTATION STRUCTURE 6
2. LITERATURE REVIEW 7
3. METHODOLOGY 21
4. FIELD WORK 25
 4.1. COLLECTED ANSWERS 28
 4.2. DISCUSSION OF THE COLLECTED DATA 33
5. CONCLUSION 37
REFERENCES 41
ANNEXES 42

LIST OF FIGURES

Figure 1. Bitcoin price index..... 9
Figure 2. EUR/USD exchange rate. 10
Figure 3. GBp/USD exchange rate..... 11
Figure 4. Methodology's structure..... 23

LIST OF TABLES

Table 1. Dissertations' schedule. 4
Table 2. Cryptocurrency's pros and cons. 14
Table 3. Subject's age. 26

1. INTRODUCTION

Have you ever asked yourself what is the point on having cryptocurrencies? What is their worth? What are we capable of doing with them and if it is safe to use it?

In this dissertation, I will try to explain every subject related with cryptocurrency and hopefully clear many doubts that might exist.

We need to understand the reasoning behind this new coin, since it can improve our life quality in many ways. At the present it is only seen as a way of investment, but what if it can be more than that? What if we can use it to perform many different activities?

This discussion has grown quite a lot over the past years, and after an extensively research, this dissertation will hopefully collect every important information regarding this subject, obtained by different points of view and experiences that will culminate in a wide broad of approaches on the theme.

The far-reaching literature review will offer a thorough theoretical data, that helps us reach some conclusions and some knowledge on the matter.

A qualitative analysis will be performed to reach the aims already explained above and have some feedback from experienced persons on the subject. This feedback will allow to have more in depth view on the theme, not only from a theoretical point of view but also from a practical one. The analysis will provide the perception subjects get with all the information we know today about cryptocurrencies.

I chose this theme dissertation since it is an ever-growing field; it has gained more and more impact in our society and consequently in the existing companies; it creates a lot of speculation around it and has caught my interest as a way of “where can we use it to improve our markets and our life quality”.

Cryptocurrency also relates to my field of studies since it can be used as a tool of innovation and improvement for companies.

In this master degree, there is a large emphasis in innovation and how corporations need adapting in order to stay competitive in their markets. In this study, we will comprehend how cryptocurrency can play an important role in the future of companies and if not adopted by

them, how can they lose all the competitiveness to direct players, since it is believed that virtual coins are one of the most important current innovations.

To understand how and why this matter has appeared, we must go back in time and first explain how our current coin was created and the actions that could perform. Only then we can understand what problems lead to the creation of this new coin and explain what it is. After that point concluded we will “enter” in a more in depth view of this matter.

Firstly, an explanation regarding the evolution of money and where it led us. This will be achieved by a journey through history, enumerating every important change that happened in our past, concerning currencies since the beginning of trades. The journey will end and culminate in the appearance of the first virtual coin.

Secondly, the introduction of the very first cryptocurrency that appeared, Bitcoin and what impacts it had in the corresponding reality. In this point, it will also be explained small topics like the speculation associated with the cryptocurrency in a market point of view and the evolution it had throughout the initial years and the reasons that involved those developments.

Thirdly, the discussion how this innovation creates or might create the possibility of a unification of markets, not only between different countries but also between different continents. This topic helps understand how virtual coins can help the enhancement of international trades, they can be eased by the usage of one universal coin.

Lastly, with this dissertation, I wish to understand what impact cryptocurrency has in people’s lives, not only in the present but also in the future. However, to reach that purpose, a lot of conjecture will be performed since there is no possible way to be certain about what comes next regarding cryptocurrency. It is still a very fresh matter where the possibilities are countless, on what actions will it perform for us. To complete the previous information, I will focus specifically in the following points:

- The emergence of the cryptocurrency
- The reaction of the society to this emergence
- The usage of this coin
- The future of cryptocurrency

After the previous points are concluded, companies that are adopting this innovation will be enumerated and somewhat explained their goals and achievements.

The main objective of this dissertation is to understand what cryptocurrency means to the world in a financial and personal way to people themselves. To achieve this goal, we will need to understand the beginning of the coin itself, using an empirical analysis throughout the years all over the world.

To help the readers in the contextualization of this matter it is important to present individual objectives such as:

- Characterize the market where cryptocurrencies will be incorporated, their current limitations and advantages;
- Analyse what benefits cryptocurrencies bring to companies and to our society;
- Expose the restraints associated with this innovation;
- Propose possible changes and incorporations with this new coin;
- Measure the possible improvements with the new proposals when compared with the beginning reality;
- Present final recommendations.

Only with these objectives uncovered it is possible to fully understand the reason behind the appearance of this new “technology” and the potentials it has. This way the research is properly conducted, simplifying the comprehending of the main concepts and ideas that need to be transmitted in this dissertation.

The previous objectives will also be reached due to a well conducted methodology based in interviews to a various number of subjects that have knowledge on this business. After all the dialogues are transcribed and the dissertation is completed, it is expected for a conclusion to be obtained by the readers, clearing the existing uncertainties on the subject.

1.1. SCHEDULE

This dissertation is expected to be in constant evaluation, by the supervisor and the author, throughout the whole writing process, in order to understand if the information is well transmitted and if it valuable to the understanding of the theme.

In this chapter a schedule will be presented, where it is divided by months since the start of the dissertation writing. Ahead of the months, we can see the corresponding steps concluded in that interval. This timetable has the goal of helping the author to complete the tasks at the correct

time and consequently to help have an organized study during the whole process, this helps to be more efficient and controlled.

Unfortunately, due to the current pandemic this table was subjected to changes, since the very own university deadlines were changed. Until the end of February all the steps were the same, however since March, due to the confinement and the delay of the deadlines, it was an opportunity to reinforce the quality of the study, with a new thorough analysis of the written data and the collection of new one.

With the development of the Covid-19 virus and the impact it had and still have in our world, it is very opportune to add a chapter where the virus connects with cryptocurrency. To reach this associations, a new study was performed, with all the possible links found between these two matters. After the search was concluded, the chapter was written and consequently added to the already existing literature review.

Despite being such a controversial and unfortunate problem, this pandemic can perform a very strong influence on the appearance of virtual currencies and the importance they can have in our society. It was very beneficent to this dissertation the inclusion of this section, since it can help lead to new studies in the future.

Table 1. Dissertations' schedule.

August	<ul style="list-style-type: none"> • Definition of the type of dissertation • Definition of the theme
September	<ul style="list-style-type: none"> • Search for articles that have impact in the dissertation • Start of the literature review
October	<ul style="list-style-type: none"> • Start of the research problem
November	<ul style="list-style-type: none"> • Definition of the methodology and objectives • Deliver of the initial draft of the dissertation

December	<ul style="list-style-type: none"> • Gathering of more literature review
January	<ul style="list-style-type: none"> • Formulation of the interviews
February	<ul style="list-style-type: none"> • Subjects invitations to participate in the qualitative analysis
March	<ul style="list-style-type: none"> • More in depth view of the whole dissertation
April	<ul style="list-style-type: none"> • Extension of the study, with the goal of writing a chapter dedicated to the Covid-19 pandemic
May	<ul style="list-style-type: none"> • Addition of the new chapter to the literature review
June	<ul style="list-style-type: none"> • Making of the interviews
July	<ul style="list-style-type: none"> • Gathering of all the answers given by the subjects • Connection of all the answers received from the interviewees
August	<ul style="list-style-type: none"> • Development of conclusions
September	<ul style="list-style-type: none"> • Limitations of the present dissertation
October	<ul style="list-style-type: none"> • Final review • Dissertation delivery

1.2. DISSERTATION STRUCTURE

The structure of this dissertation is divided in the following chapters:

Chapter 1: Introduction of the dissertation, encompassing the identification of the type of thesis, theme, research problem, objectives, methodology and finally the dissertation structure.

Chapter 2: Literature review that features every necessary information to retain in order to lead a complete methodology, with the corresponding characterization of the market where cryptocurrencies are inserted.

Chapter 3: Elaboration of the dissertation's methodology, which will be used as guidance to reach the established objectives.

Chapter 4: Field work, where the methodology is put into practice and the qualitative analysis is completed. Also, contains the assessment of the obtained information due to the interviews made.

Chapter 5: Presents and discusses the schedule of the developed work of this dissertation. The schedule shows each step of this work until the its conclusion in a chronological way.

Chapter 6: Presentation of the withdraw conclusions.

2. LITERATURE REVIEW

As we all know, there is various forms of Money, metallic coins; paper money (notes); bank money (cheques, drafts or even bills of exchange); near money (deposits, government bonds). For the simplification of this dissertation we will only focus on metallic money and paper money, since these are the ones that are most likely to perform the same actions as cryptocurrencies.

Starting before the coin even existed, the only mean of exchange was goods, people traded them with each other, however there was no real value attributed to the goods, there was only bargaining and negotiation between the agents. As times evolved coins were created, not with the intention to be used in transactions initially, the original goal was to express how much farm workers were owed. The note would be expressed in the following manner: “Mr Nabuk has received grain valued at three metal coins” (Varoufakis, 2019). Meaning that in the beginning this form of money was fictional, showing us that today methods of payment are not so different than in the start of the economy. Only many years later physical coins started to be used, this meant that currency was starting to flow inside countries and even between them, goods started being bought by coins instead of traded for other goods. It is important to refer that by this time, coins had already different values associated, based on their weight. Since the material was the value in the coin, it was a direct correlation since weight/value. Meaning that when one was greater so was the other.

Times progressed and with this, banks started using paper money, in order for their clients to carry a note instead of hundreds of coins. This note offered the capability to be taken into the bank, at any time, and exchange them for coins (Andrew Beattie, 2019).

Paper money could also be used to buy goods, just like today, the only difference is that in the past this money was issued by banks and private institutions, instead of today that is issued by the government (entity in charge of creating the currency used by most countries nowadays).

The shift to this new form of money, allowed countries to increase the amount of contact in international trades, however it is not only good consequences present in this change, banks started to buy currencies from other countries and that allows to affect each other’s stability and ability to trade in the international market. This lead to a competition between nations, that happened in two possible ways, by driving up one currency in order to make the goods of that nation very expensive, or by driving it down and reducing one nation’s buying power. It is easy to understand that when one nation wants to be the most powerful one, it would use these

behaviors to affect another's nation economic stability, meaning that the currency's disturbed nation would lose value when compared to other's countries' currencies.

The last type of money to appear was cryptocurrencies, in this specific case Bitcoin, created by Satoshi Nakamoto, a software developer, in 2009. After the first appearance in 2009, more than one thousand and five hundred cryptocurrencies have been created.

This money has no physical coinage like our current currency, it only appears in the virtual universe. It was created based in a mathematical formula, that is at the disposal of everyone, meaning that people can check it, to understand what it does; what it proposes; to create their own cryptocurrencies.

The goal of Satoshi was to develop an electronic payment system, after many advances/breakthroughs, he reached a point where the currency created would not be affected or controlled by any authority meaning that for the first time, the world had a decentralized currency. The transaction fees were almost inexistent and instant.

The appeal of cryptocurrencies is the fact that it offers lower transaction fees than other online payment mechanisms (Andrew Beattie, 2019).

For as long as we remember, we have always lived with the premise that we are constantly being watched by the biggest government companies and banks, to escape this rule Bitcoin was created. This technology has the particularity of being controlled by a decentralized system. Current currencies are all controlled by the governments since they are the ones that issue them and in some countries, this premise goes as far as imposing the people where they can or cannot spend their money, the state has the power to block transactions, meaning that the society could not spend their money freely. This means that our physical coinage is centralized, Bitcoin allowed people to break this regulation.

It had the help of appearing in the right time, 2009, during a strong crisis, everyone was furious and revolted with the banks and the governments, which promoted the desire of having a coin that could not be controlled or taken by a superior entity. It is important to point that this coin also allowed people to buy illegal services without being "caught" by the government, since there is not any trace on this coin or who is using it. That was very appealing to the society.

In the first years, Bitcoin did not have much value in the stock market, in 2010, 1 Bitcoin had the value of 0.6 cents, which means that 50 Bitcoins were worth 3\$. As the years went by this

coin started to gain some attention, and with it also some value, companies started to create their own cryptocurrencies which boosted even more their value and by 2017, 50 Bitcoins had the of 850,000\$. By the end of 2017 Bitcoin had as much value as the biggest banks in the world. However, like all good things, they came to an end, so did the value of this currency and in 2018 it collapsed.

The following graph displays Bitcoin’s market value from the 18th June of 2010 until the 1st September of 2020. From the chart, it is possible to corroborate the information revealed above.



Figure 1. Bitcoin price index.

In a more in depth view, it is possible to claim that since the start, in 2009, Bitcoin value had e constant growth until 2014 where we can see the first drop in value. The numbers stayed almost constant for approximately one year and a half, only dictating fragments of volatility during that time, however since the start of 2015 the value started to increase and that growth only stopped in 2018. This exponential growth reached its peak in 2017 most because in April 2017,

Japan started treating Bitcoin as a legal form of payment driving a sudden increase in the Bitcoin price in US dollars (ElBahrawy, Alessandreti, Kandler, Pastor-Satorras & Baronchelli, 2017). However, in 2018, the biggest crash in value took place, this drop only stopped around 2019, where another increase appeared. This increase was not constant and had a lot of appreciations and depreciations during almost one year, but by the early beginnings of 2020, the world saw another growth in value that is still constant until today. In conclusion, it is possible to claim that Bitcoin’s stock market has grown over the years, however it is not as high as its peak in 2017 due to the high volatility that cryptocurrencies have associated.

What happens when cryptocurrency’s stock market is compared with physical currency’s stock market like the Euro or the British Sterling? These two last coins were chosen since they are the ones that apply for the best comparison with virtual currencies, since in the three cases, they all have the exchange rate to the US Dollar.

Regarding the Euro, since 2009 we are seeing a drop-in value, in 2008, 1 euro was equivalent to more than 1.5000 US Dollars, currently in 2020, 1 Euro only has the value of 1.1718 Dollars. The lowest value took place in 2017, where 1 euro had a value lower than 1.1000 Dollars. Bellow, we can see the graphical display with the EUR/USD exchange rate.

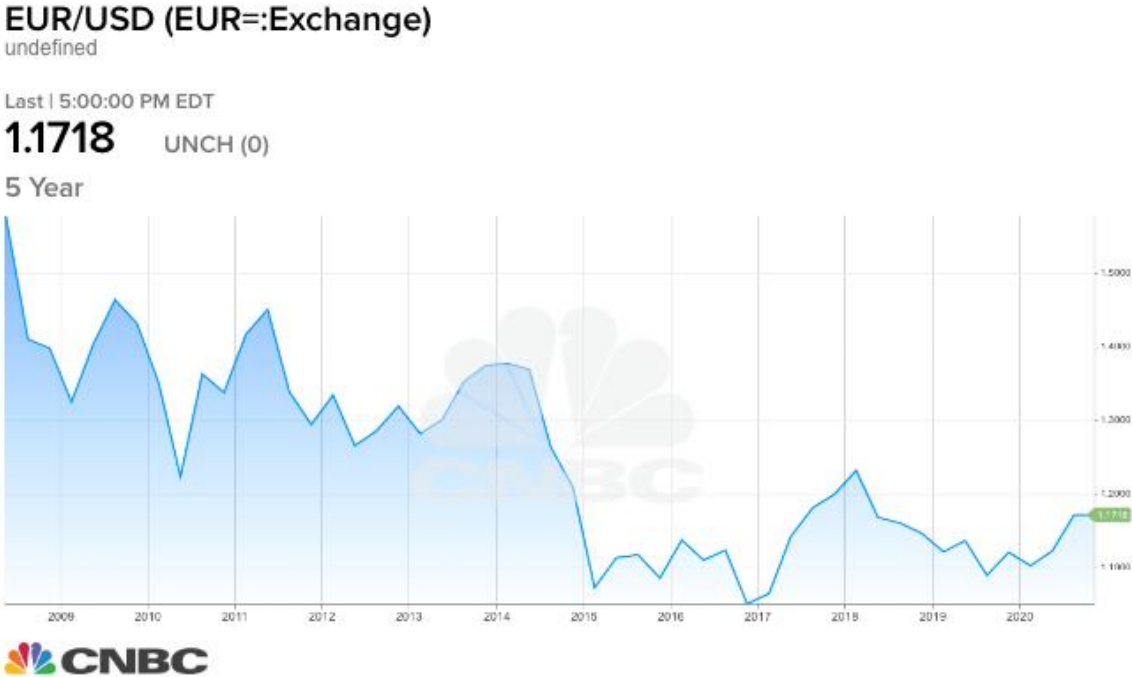


Figure 2. EUR/USD exchange rate.

Taking a stroll up the Europe, we reach the United Kingdom, where the used currency is the Sterling. This coin always had a higher value when compared with the Euro. However, the evolution of its value is not so different. They both registered much bigger values in 2008, in the latter case, 1 sterling had the value of more than 1.9000 Dollars, and they both had a major drop, and by 2009, 1 sterling was worth less than 1.4000 Dollars. The lowest value seen in the last decade was not a long time ago, still in 2020, 1 sterling only had the value of less than 1.2000 Dollars, mostly affected by the pandemic the world is currently living. Again, the graphical display is shown below.

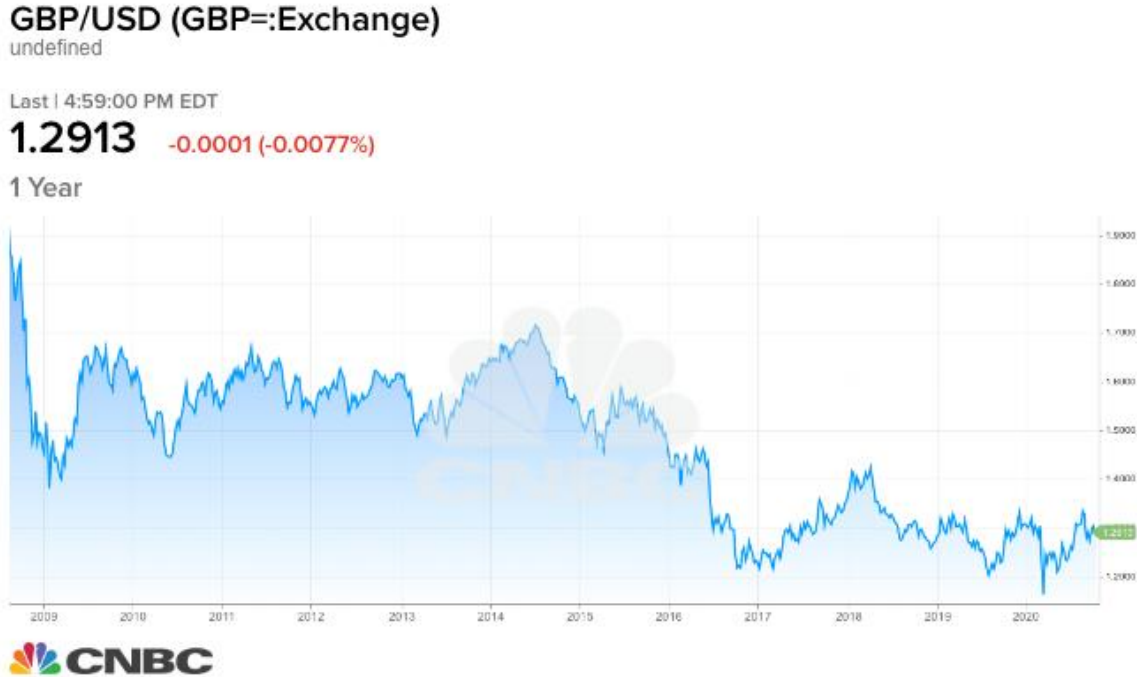


Figure 3. GBP/USD exchange rate.

The drop-in value in 2008 is due to the big economic crisis that society is still recovering today. All currencies received an expectable massive crash. This led to one of the reasons cryptocurrencies appeared in the following years, a currency where crisis did not affect its value, a paradise for the world due to the situation society was living.

When compared to Bitcoin, we can conclude that during the last decade, both physical currencies had a constant decrease in value, while Bitcoin had a massive increase in 2016/2017 and then a massive decrease in 2018. However, contrary to the Euro and the Sterling, Bitcoin

increased again in 2019 and since then the value had not changed much, concluding the current pandemic has no affect in cryptocurrencies. The reasoning behind small drops in value in virtual coins is due to legislative, technical, and social advancements. For example, a change in regulation in China resulted in a 100\$ price drop in Bitcoin (ElBahrawy, Alessandreti, Kandler, Pastor-Satorras & Baronchelli, 2017). It is important to state that these mentioned reasoning, only explain small changes in value, the massive drop in 2018 had different logic behind it and will now be explained, introducing also a new matter regarding cryptocurrencies.

So how can the 2018 collapse be explained? The reason behind such collapse, extremely visible from the figure, was the existence of hackers that could take advantage on people that bought this coin. Because this coin had no control by any entity, people did not have any kind of insurance on their stolen money. Also, the fact that people expected the government to act on these currencies, helped bring their stock market to the ground, since the entities did not get involved and consumers ended up being scammed in their investments. It is not only pros associated with cryptocurrencies and a major con will now be exposed.

This security con lead to one of the most controversial focuses associated with cryptocurrency, the battle between centralized vs decentralized system. Despite most authors believing that cryptocurrencies are decentralized, there are also a minority that believe the contrary, that it is a centralized system controlled by a single entity. My opinion goes along with the majority, since we are dealing with a blockchain, a concept that will be explained later.

For decentralized system, we comprehend a system where the interconnected information is not given by a single entity, in this case we can understand that in some way cryptocurrency is already decentralized since the coin is not controlled by a single banking authority. However centralized systems are much more efficient, since there is a central mechanism where decisions are made and transmitted to other components. and the costs associated are much lower, which means that companies would spend more money not in software but in hardware (materials) (Elad Gil, 2019).

To fully comprehend cryptocurrency, we need to understand what is a blockchain. It is known to be a database with unique characteristics, being the most important, the fact that these data cannot be erased from the system. Every information (ledgers) is protected or cannot even be found by third parties, which means that it cannot be hacked or copied (Olshansky & Wilson, 2018). Then if the information is protected why did Bitcoin lost so much value due to hackers? To answer this question, it is mandatory to go “deeper” into the IT department. Every

transaction is recorded in the blockchain, and every own protocol that maintain the blockchain are responsible for the security of the Bitcoin. However, despite every information being protected it is in the transactions where this currency is most vulnerable, since it not fully secure against users that use different fraud attacks on honest subjects (Lunagaria & Vyas, 2014). As transactions, we comprehend transfers between two peers of the network, and it is in this interaction where things get complicated since there are some services that provide the facility in these transactions, thus they are the ones that are attacked by hackers. There are five types of attacks, they are the following:

- Attacks on the Wallet Softwares: “wallets” is where the client manages the Bitcoin he possesses. Generally, these online wallets are more vulnerable to attacks (Lunagaria & Vyas, 2014).
- Time jacking Attacks: happens when the attacker announces an inaccurate time for the transaction and then changes the original transaction time, this can lead to double-spending.
- More Than Fifty Percent Attacks: takes place when the users acquire more than 50% of the computing power (Lunagaria & Vyas, 2014). Meaning that these users are now able to modify or self-reverse transactions. Once an attacker is successful with the assault more attacks can take place.
- Double-spending Attacks: in this attack, an attacker with coin A makes a transaction to the receiver and at the same time the transaction with the same coin is made to another address that might be in the control of attacker (Lunagaria & Vyas, 2014). This fraud is easily passed by a real one and concluded even firstly than the authentic one.
- Selfish Mining Attacks: happens when the attacker force honest users to waste computer power in transactions that will not take place.

In conclusion, this concept of blockchain associated with cryptocurrency, plays a big role in people’s mentality. We can reach this point by understanding that individuals nowadays do not want to lose money or to be taken away by the government, so this innovation allows that to happen, since no third party has the power to reach that money, because it is “fictitious”. However, attacks can happen anyway but not on the blockchain itself, but in transactions needed to complete the purchases.

Despite all the possible cons, it is expected that in the long-term money will be heavily affected by this trend and citizens consequently. In a personal point of view, as time goes by entities

will be more encouraged to invest in this type of money, since it can be seen as the future of our currency. In the following table, it is possible to see the pros and cons associated with cryptocurrency, for easier comprehension and recapping of all the information above.

Table 2. Cryptocurrency's pros and cons.

Pros	Cons
Decentralized system	Volatility
Security and Control inside the blockchain	Still in development
Low transaction fees	Acceptance by the society
Transparent and Neutral	Attacks in transactions
Users are constantly involved	Flaws in protocols
Freedom where to spend the money	Possibly only applicable on a certain group of citizens
Less risky	

These facts have a lot of impact in the way we can use virtual currencies, and possibly the applications for it. As it will be mentioned, today’s society still has no trust on this new coin, which is normal since there is a lot of speculation around it, about security and control, however it is harmless to say that it is probably the safest coin in the market, however, people only buy it as an investment and not as a mean of buying goods.

Nevertheless, there is another factor, that was not mentioned in the table of pros and cons, that can play an important role whether virtual coins are part of the world’s future or not. The matter “in hands” is the unification of markets. As today stands, the global markets are not completely

unified, whether it is due to regulations or even incompatibilities between countries. This can become a problem not only for countries but also for the population.

With this incomplete unification, the world's population can be strongly affected in their choices. Specially, when we are dealing with final consumers. It is very easy to understand what the words above mean, since many times people want to buy goods online, even more during the pandemic, and they cannot due to restrictions on the websites. In the end, we receive an alert saying that the good we desire is not sold to our country. It is very unsatisfying to see our needs being denied due to the place we live in. Most certainly, it is also very unproductive for the sellers to not be allowed to sell to the whole world, or to pay extra in order to do so, since certainly they want to sell the most countries possible, in order to embrace as much market as possible. It is simple economics, the more market they cover the more sales they perform and finally, more profit they get. Not only their sales are being restrained, but the sellers are also being forbidden to discover new markets where their products could have massive impact. In conclusion, we are seeing a lot of restrains not only in an individual level, regarding firms, but also in a global level, regarding countries.

How can cryptocurrency help in this matter? Well, it is very simple, most of these transactions mentioned above, do not happen due to the differences in the currencies, legislations, regulations and the fact that there are a lot of currencies in the world, it is not easy, to have a business where all the currencies are accepted and exchanged to the currency the company operates. There is where cryptocurrency appear, a way for enterprises to work with only one coin in the whole world. Imagine how easy would it be to perform every single transaction in one currency. Companies could sell to all countries since the coin would be always the same, there would not be more costs associated or exchange losses.

With cryptocurrency in place, there would be an almost perfect unification between all markets, imagine how much businesses could prosper selling to the whole world and how much the economy would be powered. Even more in situations of pandemic, where people do not want to leave their safe place and most shopping is done online. A world where we see a gadget in Japan we desire so much, and by paying, for example, three bitcoins, we can have it by the end of the month. No more restrains in our requests.

This can also be taken into a global level, a level that could bring much bigger impact to our economic situation, a larger change of goods between countries, even the social relations would be more positive amongst governments. It is one of the matters that must be discussed in future

studies, how much the world's economy and social relations could prosper due to the implementation of one universal coin.

This idea presented above might not be so far as one might think, the world is currently seeing a growth in the importance of Bitcoin and other virtual coins, companies are starting to adopt this technology by creating their own cryptocurrencies and implementing it in the selling of their products, so it is important for society to understand what this innovation means and the changes that are associated with it.

Companies like Google and Microsoft have lately started to invest in their own cryptocurrencies. In Google's case, recently started partnering with multiple prominent blockchain companies to add Google pay as a payment method for cryptocurrencies purchases (Osher Deri, 2020). The reasoning behind this partnership is the fact that the demand for cryptocurrencies has rapidly grown amongst retail investors, so Google decided to offer Google Pay as a payment method. Paxful was the first exchange platform to facilitate Google Pay transactions (Osher Deri, 2020), allowing people to buy Bitcoins through Google's payment system. Later, Coinbase also partnered with Google, this time to allow users to make their payments using their cryptocurrency balance. Recently NewsCrypto, an education platform and cryptocurrency trading analytics, became the first platform to offer direct cryptocurrency purchases using Google Pay (Osher Deri, 2020).

Google Pay's intro in the cryptocurrency market was an important step to virtual currencies, opening the path to its mass adoption, since Google Pay have more that 67 million users, and everyone with a smartphone can buy and use cryptocurrencies.

Microsoft however took his investment to another route. The department of Technology has been granted an international patent for a body activity data based in cryptocurrency system. This patent allows to measure or sense body activity or scan human body. The system may reward an owner or a task operator for providing services, with cryptocurrencies (Kevin Helms, 2020). According to Microsoft, the way this technology works is by "a brain wave or body heat emitted from the user when the user performs a task provided by an information or service provider, such as viewing advertisement or using certain internet services, can be used in the mining process". This is another example of how companies can utilize cryptocurrencies' technology of mining.

It is important to note, that multinational companies are starting to adopt this technology, it is not only a way of investment no more, as shown above, this innovation can have multiple applications and it is most likely a very important component in the future of companies. All these factors exposed previously, help encourage the value of cryptocurrencies, that is the reason it has so much volatility associated, because every single adoption or restriction helps the growth or decrease in the stock market, making it such a high-risk investment.

This leads to a very important question: what will be the future of cryptocurrency? It is impossible to be certain of anything, however, there are a lot of predictions that can be done. In our current state, the impact of cryptocurrency is around financial services and the emergence of a new digital class. We must distinguish two different times, first the short term and then the long term.

In the short term and as already mentioned above, for the biggest part of the population, cryptocurrencies will be seen as a bond or stock, where people can invest in order to see their money hopefully grow. People can buy it in whatever quantity they desire and sell whenever they want with the objective of making profit.

In the long term, there is no conviction about the future of this currency, it depends of various factors, such as if companies start using it in order to sell their products, if such thing happens, then cryptocurrency will be seen as any other coin like the Euro or Dollar and might even one day, substitute all the current physical coinage. However, this process can take years to develop, since most people are not familiarized with the concept of cryptocurrency and it is not easy to eradicate the present tradition.

Regardless these beliefs, there is another important factor that can dictate the future of virtual currencies: Pandemics like Covid-19.

For the last few months, the world has been living very atypical times due to the Corona virus, we had to get used to a reality never lived before. This reality also brought a new mind-set to the world, which can encourage the importance of cryptocurrencies. This will be explained by listing the different impacts that pandemics can have in our currency and in virtual ones. These differences can be divided into two categories, one related to people's health and mentality and other related with the economy.

Starting by the first one: people's ability to keep living their lives without having any risk of being infected or even to infect someone. This is a very hard assignment since it is impossible

to have none social interaction and still live our lives. People still need to keep shopping for goods and how can they do that being completely safe? One major problem is how to proceed to the payment of those goods, we can do it by credit card which still has a lot of contact with other people and machines but it is probably the safest way, or we can use physical money which has more risk associated, since coins and bills have passed through many people's hands.

It is important in times like these for people to feel safe, and in this context, enters cryptocurrency, a safe way to proceed to the payments needed in this reality. It is important to mention that it would only be possible in a society where this coin was the used currency, people could enter on their phones and proceed with the payment of their goods, not needing to use any kind of physical money or even cards. The exchange would be done without having any social contact and without passing any object through both people's hands, which would help society to feel much safer and probably to reduce the number of infections during a pandemic. This shift of mind-set in society would not be too aggressive since consumers are adapting to the "new normal" and are suddenly forced, but also willing to make decisions online (Max Lautenschläger, 2020). With this conclusion, we reach the first major difference between virtual currencies and the current one, the need for interactions in the latter, that can lead to a shift in people's mentality in order to feel safer.

Now turning our attentions to a more economic view, it is possible to conclude that when Covid-19 appeared, the world was not sent into an economic crisis but to a liquidity one, meaning that investors were trying at their best to liquidate all their assets. Consequently, all asset classes suffered severely, even "safe havens" like gold decreased by more than 10 percent (Max Lautenschläger, 2020).

Like in any other crisis, the central bank has an important role in it, in this case, they started to print more and more money and to increase the circulating supply, this needs to be done in order to maintain a nation's economy healthy. However, due to past experiences all citizens know what happens after a massive injection of money in the markets: inflation, yet another very important factor that can enhance cryptocurrencies (Bradley Keoun, 2020). It would not be the case if our currency was virtual: The beauty about crypto is that code is law, which means that the supply-demand-relationship is predefined (Max Lautenschläger, 2020). We can reach the conclusion that if we lived in a world where the money supply was already predefined, then in moments like these, we would not be affected by a massive rise in prices and consequently a loss in the buying power.

It is possible to say that in situations like these, cryptocurrencies would have a much more positive behavior in our economy, people would not feel the crisis as much, since there would not be a major injection of money by the government and consequently a massive inflation. The second major difference between currencies, the way they would behave after the appearance of a crisis.

In conclusion, it is believed that the next step in our economy is to start creating cryptocurrencies for the current coins. The discussion of introducing a blockchain-based Euro or US Dollar is again one of the top priorities for central banks all over the globe (Max Lautenschläger, 2020). From evil, we can withdraw some positive, that is how much this pandemic is sending us into a more digital financial system. We can even notice it in the stock market since most virtual currencies are gaining value, going against the trend in almost all currencies like the Euro or the U.S. Dollar.

3. METHODOLOGY

As it was mentioned before the goal of this dissertation is to explain and clear the existing doubts regarding cryptocurrency since it is a very recent affair and an ever-growing field with lots of expectation and possibly influence on the financial world. The aim is to answer the question “what made cryptocurrency occur and what impact does it have in modern society?”

Since this problem is more theoretical, most of my methodology will be based in research of articles and lectures. Despite that, a qualitative analysis will also be performed to receive different perspectives from individuals that have an opinion on the matter.

Before the covid-19 pandemic started, the expected analysis on the methodology was to perform the focus group method, this method would consist in the gathering of six people in the same space. Then the interviewer would start to ask the questions in the rotary with the goal of the interviewees to start answering. It would bring a lot of benefits to the study, since after the answers the subjects would perform a discussion between each other regarding every question. Why would this benefit the analysis? Well, a lot of topics would be discussed, a lot of point of views would be presented and consequently the dissertation would be massively enriched. The subjects would also be more comfortable to present their ideas and to discuss them presently.

However, and unfortunately due to the situation we are living, it is very hard to gather all the subjects in the same room, since they would not be open to that situation due to safety matters. So, in conclusion, the interviews will be done individually and virtually. This way the subjects can still participate in this study and offer their knowledge on the matter and in the end, that is the main goal. The discussion however it will be harder to have, since there will not be a share of ideas. The study will be supported by a lot of different experiences, for this to happen the subjects chosen needed to have very diverse types of contact with cryptocurrency.

As already mentioned, the method used will be interviews to subjects that had some contact with cryptocurrency and have a formulated idea regarding the subject. The questions requested will be concerning their experience with the theme and what are their thoughts regarding the current and future impact of this coin not only in our society but also on companies themselves.

There will be six subjects interviewed and the whole process will be divided by the following stages:

- Stage 1: an invitation to participate in the study performed in this dissertation;
- Stage 2: request for a short bio with a maximum of three lines where the subjects explain their professional experience and their contact with cryptocurrency;
- Stage 3: making of interviews, a small amount of semi-open questions will be performed, where the interviewees will answer them carefully based on their interaction with virtual currencies;
- Stage 4: the answers received will be rigorously processed and studied, with the goal of getting the conclusions needed;
- Stage 5: enumeration of the conclusions reached with the analysis and future applications this dissertation can lead.

The first impression is that the questionnaires conducted will be semi-structured, since the goal is to also go out of topic to receive the maximum information possible. It is important to state that the subjects identity will be anonymous due to expressed requests and since it is not relevant to the study itself. In the end of this chapter a graphical display will show every step enumerated above for easier comprehension to the readers.

After all the answers collected, a thorough analysis of the content will be performed, categorizing and discussing the information received. Also, there will be an “investigation” regarding the pattern of answers, whether they are almost the same, or if there is some differentiation that needs to be exploited.

My methodological choice was based on the impression that since cryptocurrency is a rather recent matter, theoretical information is not enough to give a detailed impression on this theme.

It is important to have opinions from individuals that had some contact with this type of coin, since it is a new experience to the world, it is something that have never existed, neither there was technology that performed the same or similar actions. Also, these interviews will allow to gather more information and the participant’s perceptions and emotions on the case.

Despite all the points already referred there are also some limitations with this method. The first one being the fact that it is not easy to encounter people that had some contact with crypto coins and that have perception on the topic (many people had contact but was only based on investment of buying the coin and reselling it). The second one being that, because the interviews are only semi-structured the results cannot be generalized and it is difficult to have a main thread. However, the question’s order allows to have a somewhat guided script, that helps reach the most important points in this dissertation and exploit them. It also helps the

reader to have a main thread thinking, the questions are somewhat built with the goal to culminate in the important question that is: what is the future of cryptocurrency?

Graphical display of the Structured methodology step-by-step:

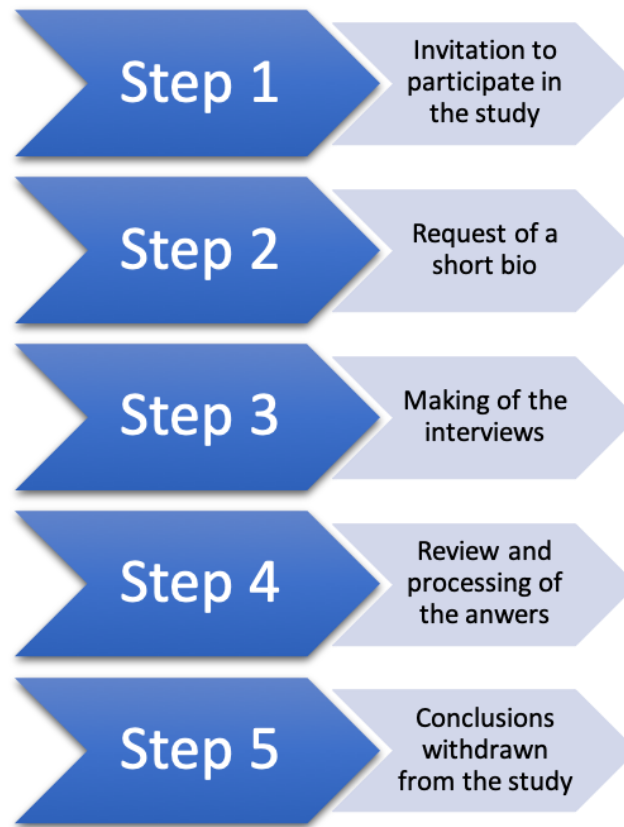


Figure 4. Methodology's structure.

Above, we can see the structure behind the qualitative analysis presented in the next chapter. All steps were done and analyzed individually, for better treatment of the information. It is important in this activity, to not have any kind of crossed information. All information regarding the subjects must be considered, in order to intake the most accurate information possible, this way the conclusions can be based on the characteristics of the interviewees and that helps to understand if it depends of any situation or if it is just based in each thinking mind.

4. FIELD WORK

In this chapter, the methodology will be put into practice and under a scope. A brief contextualization, starting by a short summary regarding the interviewees and in what will consist their experience in this study will take place, in order to better comprehend the impacts this qualitative analysis might have. This matter of cryptocurrency is very recent, it is not everyone that have a general knowledge on the subject. Despite that, it is also needed some awareness regarding world's economy and capitalism.

As it was mentioned in the literature review, cryptocurrencies have been gaining further reputation and consequently, started to gain more and more importance/value in the markets for the past five years. Even more so during the covid-19 pandemic, which goes against the expected. For example, every other physical coinage has dropped in value since the start of the confinement. It is important for people in this study to be aware of this reality and the past associated to virtual currencies, otherwise the answers might not go according to the projected and consequently, the analysis might not be affective, since the answers differ a lot.

The questions asked are not objective, they are supposed to have an open answer where the interviewees might pitch their idea regarding every interrogation. This will promote and open discussion to many topics. In a perfect reality, these ideas would be questioned by every subject, and arguments would be exposed, however since it is impossible to unite every interviewee, the message must be passed in a different way. A thorough examination of every answer given followed by a correlation with the information provided in this study.

The expected outcome of this qualitative study is to hopefully clear any remaining doubt after reading this dissertation and create new ones that might not have been discussed previously. In order to do that, these questionnaires are mandatory, to have a better perception of the opinions ordinary people might have on this subject.

The topics approached will be:

- Knowledge on the cryptocurrency matter
- Types of contact with cryptocurrency
- Cryptocurrency's safety
- Cryptocurrency's future

The interviews are based on five primary questions and one secondary question, later in this chapter all interrogations will be transcribed for better understanding of the reader. It is important to state, that all the interviews were produced in Portuguese, since it is easier for the interviewees to expose their ideas and explain their thoughts. If the questions were directly made in the language that this study is presented (English), the result might not have been the expected since some curtailment could exist, resulting in a worse experience for the subjects and a harder time to present their arguments. Despite that, a translation will take place in this chapter, all the questions and corresponding answers will be presented in English, however in the annexes, there will be the original manuscript in Portuguese, in case there is any doubt.

Turning our focus to the subjects, as already mentioned, their identity will not be revealed, since it is not necessary for the study to be successful, instead and because there are six interviewees, the division will be made from subject 1 to subject 6. All these subjects will have a short bio, where their professional careers are described. This will hopefully give some enlightenment or framework regarding the interviewees for better understanding of their answers.

The answers might depend on various reasons: experiences; contacts; field of studies; between others. Given this, a table will show the corresponding age of the subjects with the goal of realizing if the age is somewhat interconnected with the thinking behind this matter.

The age table is presented below:

Table 3. Subject's age.

Designation	Age
Subject 1	24
Subject 2	25
Subject 3	24
Subject 4	37
Subject 5	35
Subject 6	29

Now that the age is correctly divided by the corresponding subject, their short bios will be presented, this bio was asked to be sent by them, where they explicit their professional status and field of studies they are involved.

- **Subject 1:** Bachelor in Management, Master of Science in Management with Specialization in Strategy and entrepreneurship. Six months' participation in ISCTE Junior Consulting followed by three years as management controller in Strong Charon. Currently working as management consultant at PWC.
- **Subject 2:** Bachelor in Economics, Master of Science in Management. Career started as an audit analyst at KPMG and continued so for one year and a half. Currently working at LeasePlan as an accounting analyst.
- **Subject 3:** Bachelor in Management followed by a Master of Science in Management of Services and Technology. Worked for one year as an operational manager at Sonae and is currently at Google via Qualitest as an SLS.
- **Subject 4:** Bachelor in Economics followed by an MBA in Sports Management. Has experience in management and administration of multinational sectors such as construction. Development of software in Portugal and founder of Twimify; iioGa and Visual Labs. Currently working in high sports competition, namely in the fields of management; marketing and clubs/athlete's communication.
- **Subject 5:** Master of Science in Computers and Telematics Engineering, was VP of Engineering at Unbabel and CTO at Faber Ventures. Currently co-founder and CTO of Remote and a mentor of startups and entrepreneurs since 2014. Subject 5 was also a mentor of a startup who works essentially in cryptocurrencies field.
- **Subject 6:** Concluded his PhD in Computer Science in 2019 with special focus in the use of software and virtualization technologies in Telecommunications Networks. Currently, subject 6 is a System Developer in a software company.

Now that all the subjects are correctly presented, we can have some feedback regarding their past and present fields of study. It is easier to perform some connections based in their knowledges, the analysis is richer and the conclusions taken have more fundament. All subjects have completed at least their Bachelor degree and all continued their studies in the corresponding areas.

The interviewees, due to their professional career, are all aware of the economy and stock market, this allows to have more irrefutable conclusions regarding the impact of cryptocurrencies. The main goal is to withdraw ideas that substantiate the information provided in the literature review. To reach that, the following questions were proposed to the subjects:

- **1st**: Are you aware of the cryptocurrency concept?
- **2nd**: Have you ever had any kind of contact with cryptocurrencies? If so, what was the nature of the contact? If not, there is any special reason behind it?
- **3rd**: What was your incentive to initiate the contact and after the experience, what is the feedback?
- **4th**: In our opinion do you see cryptocurrency as a safe innovation or as something you are insecure about investing?
- **5th**: Do you believe that it is possible to live in a society where the transaction coin is cryptocurrencies, replacing the current physical coinage completely?

Above, we can see the nature of the script behind the interviews and the course they should follow. This allows to continue the study and in the next chapter present the answers provided by each person to each question

4.1. COLLECTED ANSWERS

The answers will be divided by the six subjects, starting by the answers of the subject 1, then the subject 2 and so on. Also, inside each section of the interviewee, there is a division for every question in the following manner, (1st) the answer to the first question, that was presented in the previous chapter, followed by the same thinking for the next questions.

SUBJECT 1

- **1st:** I am aware of what cryptocurrency is, however I have never studied the theme, or even tried to gain more knowledge about it. The only “contact” I had was mostly through news and chats between friends.
- **2nd:** I have never traded with any kind of cryptocurrencies. I only have an idea of what it is based on and the evolution in had in their value.
- **3rd:** In this case, question 3 does not apply since there was no direct contact with virtual coins.
- **4th:** The fundamental problem I see in investing in cryptocurrency is the difference I perceive between the real and the traded value. In my view, the cryptocurrency transaction is based on an asset transaction in the securities market, and as in any market it is dependent on the law of supply and demand, however it has two major differences compared to other bonds also traded. The first can be presented with the example of any type of stock, option or other security that concerns the transaction of part of a company and which directly corresponds to a part of an asset. In other words, the amount paid for the indicated security must have a corresponding part that generates wealth in the economy, in a simplified way, the company's production and efficiency. In the second point of my reasoning we have the case of transactions in the foreign exchange market, where the basis of the changes is the monetary policy in force for the currency in question as well as the economic structure that supports it. Both points that I can't see in the cryptocurrency and that, in addition to the lack of regulation, lead me to think that the existing value is purely speculative in the face of a limited offer and that it was never accepted in general by societies, in my opinion it can collapse. However, certain technologies associated with the development of cryptocurrency, in my opinion seem to have a great development opportunity, both for financial markets and for other sectors - Blockchain.
- **5th:** An immediate answer would be no. However, speculating in the long term (perhaps more than 30 years), world developments and globalization have increasingly brought economies closer together, and today we already use the US dollar for a large number of international transactions even though the currency of either the country of origin or the country of destination is that. This, in my view, is due to the security that both monetary policy and the economy sustain in the eyes of the whole world. And as such it does not cost me to take on a world that little by little, with some advances and

setbacks, goes in the direction of each time having a more united currency, even though reaching the single currency is very difficult in geopolitical terms due to the “bi polarization” of powers that have pursued modern world history, let’s look at China and the USA. Additionally, if the cryptocurrency reaches a point where most organizations, and countries accept the currency as payment, I think it will be possible. However, it will turn out to be a kind of euro for the EU and not the current hype.

SUBJECT 2

- **1st**: I am.
- **2nd**: I have. I have decided to invest in two cryptocurrencies, Bitcoin and Litecoin. I thought it was a market with too much volatility, where losses of money could happen very easily.
- **3rd**: At the time cryptocurrency had a lot of hype, so I decided to invest. My feedback is that if you are a “risk-lover” it can be an interesting market to invest, however you always need to have a large amount of money “under the pillow”.
- **4th**: It is something that I am afraid to invest. Not only by its high volatility but also by the knowledge I have on it and the possible “bubble” that might burst.
- **5th**: I do not believe it can happen, at least in the short term. Only in a very far future, many generations later, it might happen. First because the general knowledge on cryptocurrency is not much, most people do not even know what it is and second, because the physical coin we know today is implemented in our society of many years, so it is hard to replace it.

SUBJECT 3

- **1st**: Yes, it is a virtual coin stored in a cloud database.
- **2nd**: I did not have any contact with cryptocurrency, I have heard about in the news, and I know it is a coin that has been gaining a higher value in the stock market and that I can invest on it via Revolut bank.
- **3rd**: I received incentive by the Revolut bank, however I have never got to acquire any. At the current time, I only see it as a bond investment.

- **4th**: I have mixed feelings, by the one hand since it is something new and has no solid base, I am afraid to invest, by the other hand it is a coin that has shown a growth in value and it is independent of any country; state; metrology and politics.
- **5th**: Yes, I believe this is possible because currently physical currency is being used less and less, and with covid-19, credit cards are being used more and more, which basically have virtual money so to speak (we do not see it), what turns out to be like cryptocurrency, something virtual and that often passes through our bank account without seeing / feeling. If cryptocurrency starts to be increasingly accepted as a payment currency, I think it could easily become a single currency and with greater reliability in not being able to go bankrupt, as it does not depend on any state's economy, it would be a totally independent currency.

SUBJECT 4

- **1st**: Yes, for many years, maybe since 2015.
- **2nd**: Yes, I searched a lot of information regarding the theme and I performed trading for a brief period. Currently I own some cryptos as long term investments. At the time, I invested due to some liquidity, and because I believe it is the future of the world's economy in 5 to 10 years.
- **3rd**: I initiated the contact out of curiosity regarding the theme and because it was recommended to me by some close friends. Since then, I have recommended cryptocurrencies to many people, so my feedback is positive.
- **4th**: Generally, it is a safe innovation, because of its own definition and operating system. Another subject is the investment part, which should be done through brokerage and trading houses that are "safe" and confirmed by the market.
- **5th**: Yes, it probably won't be in my life time, but I am convinced that one day, the fiat currency will be completely replaced by cryptos.

SUBJECT 5

- **1st**: Yes.
- **2nd**: Yes, personal investment e advisory on a startup connected to cryptocurrency.
- **3rd**: Personal investment is due to the continued exponential appreciation of the value of cryptocurrency (Bitcoin), having gone from \$ 300 to \$ 9000 in less than 5 years.

Other cryptocurrencies have a high return on investment, despite the increased risk. It is important to note that cryptocurrency is an investment with a very high risk given its volatility and the non-indexation of its value to physical products, making its evolution quite unpredictable. Given the volatility of the currency, investment in cryptocurrency is only suitable for people with medium to high risk profile and capacity.

- **4th:** Cryptocurrency as innovation is a safe concept. Investing in such volatile asset always inspire some fear.
- **5th:** A change to a 100% virtual / cryptocurrency currency is inevitable. The currency used by human society has a physical representation with considerable production and maintenance costs and no apparent benefit. Cryptocurrency is more difficult to counterfeit, more secure to retain, global and fully distributed. Society is increasingly moving towards the total digitization of services and goods, so it is inevitable that the currency will also become virtual.

SUBJECT 6

- **1st:** Yes. My first contact was around 2009 with the introduction of Bitcoin and because some colleagues were mining this coin at the time.
- **2nd:** Being myself from the IT area, despite not having direct contact, I ended up having a lot of indirect contact. This happened because several colleagues did mining and trading of bitcoins. Personally, I never entered this market due to the needed time/ dedication, as being a too volatile a market requires extra attention to be aware of the best opportunities.
- **3rd:** I personally never had much interest in currency, despite making technological development at the base interesting. The fact that the market is too volatile and that cryptocurrencies in general (in my opinion) do not have a base in their value other than speculation, ends up retracting me thus avoiding my investment.
- **4th:** As mentioned earlier, the technological concept that underpins the transaction (namely the blockchain) of the currency is secure. However, unlike others, I personally, am not fond of the current concept of cryptocurrency. This is because the currency itself does not support any value and its growth and appreciation is based on pure speculation.
- **5th:** I have no doubt that it will eventually be. However, I don't think it will be just a matter of adoption (or willingness to adopt), new measures and strategies are needed to define its value, because while the so-called traditional currencies have their value on

the basis of human labor and precious metals, cryptocurrency has in computing power. In this sense, I have the opinion that with technological advances, new ways of sustaining the commercial value of currencies will emerge, such as the power and computational hours necessary to generate a given currency. However, I see this in a future society that I will no longer be part of.

4.2. DISCUSSION OF THE COLLECTED DATA

Now that the interviews are fully translated and transcribed into the dissertation, we can proceed to the treatment of the information received. The main goal in this process, is to identify possible commons and differences in the thread of thoughts within the answers provided by the interviewees. For that, a thorough analysis is performed, answer by answer to the cross any possible arguments given, that are important and relevant to this dissertation.

The first point that needs to be referred is that all subjects are aware of what cryptocurrency is, it is important in this study, that all participants understand this concept, otherwise the followed questions, that are more and more intensified on the matter, would not have a well thought answer and the conclusions reached would not be irrefutable.

Regarding whether the subjects had any contact with this coin or not, it is possible to claim that all of them either directly or indirectly had some interaction with cryptocurrency. By indirect contact we comprehend various interactions either with news, conversations with colleagues and friends and information retained regarding this coin or even when research was made to better understanding. However, only a few had direct contact with virtual coins, this contact was all through the idea of investment, with only one individual that took it to another path and completed some advisory to a startup connected with cryptocurrency. When asked about their reasoning behind this interaction, it was all due to the interest generated around this concept and due to the fact that existed some liquidity, so the investment had some support.

When it comes to the third question, it is not applicable to every subject. The interviewees had to explain what was their incentive to initiate the contact with cryptocurrency, however two subjects never had any kind of initiative to have those interactions, due to the fact that they are simply not interested in investing in this coin, mostly because it is a market with very high volatility and their value is purely obtained through speculation. One subject despite, never having any contact, he had some incentives from his own bank, however it never materialized.

To the people that invested and consequently had direct contact, their incentive was mostly the hype cryptocurrencies generated. Two, three years ago, these coins were gaining a lot of value in the market, and obviously, this caught the eye of investors, in conclusion demand was always increasing so did the value of the coin itself, here we can see the effect of speculation. As principal reason for initiating the contact, in all subjects was the hype and the growing value.

This contact led us into an important matter. The safety during these interactions and how the subjects felt during the whole process, if there was any apprehension or even fear investing in these types of coins. The same question can be made to the subjects that did not had any contact, however in a different shape, such as, if they would feel safe investing in this coin. In all cases, there was nothing to report regarding the fear of being scammed during the investments, all subjects realize that it is a protected stock like any other else.

However, some subjects commented on different reasons, fears, that can lead them to not invest in these currencies. These reasons are once again more guided towards the fear of losing money due to the high volatility and the fact that all the value in cryptocurrencies is based in speculation of the market, that can scare investors easily.

One important factor that subject 4 referred is the fact, that despite the innovation being completely safe, investors must always use brokerage and trading houses that are confirmed by the market, otherwise, scams can take place, and people can lose their money during the transactions.

Onto the last question, maybe the most important one, that answers the research problem of this dissertation: the future of cryptocurrency. To understand the subject's opinions, an objective question was made "Do you believe that it is possible to live in a society where the transaction coin is cryptocurrencies, replacing the current physical coinage completely?". The direct answers were all the same: yes, cryptocurrency is the future of the world's coinage. It is important to observe that despite having different types of contacts, or even no contact at all, the subjects were unanimous when answering this question. No one knows what the future has reserved for us, however the interviewees were very clear with the answer. There are some nuances that the subjects felt obliged to refer.

They all believe, that in the short-term it is not possible to replace the fiat currency for cryptocurrencies. People know too little regarding the theme and the adoption would not be possible in the whole world. When talking about the long-term, the story is different, all the

subjects strongly believe that we are walking into a completely digital era. One subject even referred a point that I believe it important to state, the fact that it does not only depend on the willingness to adopt this new technology. In his opinion it is important to create regulations regarding this currency, people need to know that they have insurance by some entity that their money is not going to simply evaporate, which can go against the own concept of cryptocurrency. Some subjects even take it a step forward mentioning that in order for the virtual currencies to become the transaction coin, its perceived value needs to change, it can not only depend on speculation, it need to have a “base to stand on”.

5. CONCLUSION

The dissertation reached its final chapter, the conclusions withdrawn from all the process of the writing of this dissertation. Cryptocurrency is a new and exciting technology that has not reached its fully possibilities, it is not controlled by any third party making a completely decentralized system. It is based in a concept called Blockchain, that can create many possibilities to our society, however it needs a great level of acceptance by the world. Based on the literature review, we can conclude that despite not being known to everyone, it is in its growing state. Its value is constantly growing and it is not affected by past, present and possibly even future economic crisis. Cryptocurrency's value is purely affected by speculation, by demand and supply, so it does not have any base supporting it. In one day, the market is strongly rising, but in the next there are no certainties that a massive decline would not take place. It is also important to say that many regulations or adoptions can affect the value of virtual currencies, for example, if one company or even country start to adopt one cryptocurrency, then its value will have a perceived rise, however if a new regulation is created, then that value will drop considerably.

Cryptocurrencies can play an important when it comes to globalization and unification of markets, the world using only common currency would create massive changes in our society, the possibilities would be countless, international trades would rise, since there is no restrictions; companies would be able to sell their products to many more markets, and consequently boosting their country's economy.

In the past months, more and more multinational companies are adopting this new technology, not only to help facilitate people's way of investing in this coin, but also in new technologies of gathering data and mining information. These adoptions will help to grow the importance of cryptocurrencies, since people will be more aware of what this concept brings to our world. Everyday there are news regarding virtual currencies, so in conclusion, the society will become more familiarized with cryptocurrencies.

Covid-19 also boosts cryptocurrencies hype, because it is a safer coin to use, the spread of the virus would be more contained if the currency used was not physical, changes of goods almost every time involves physical contact, however, if we had a completely virtual currency, the exchange of goods would not involve any touch. During the pandemic people got used to buy most of their goods online, what lead us to an important point. Society took a big step to a new

completely digital era. People's minds took a big twist with this reality the world is living, which can make easier a transition from fiat currency to a crypto one.

Regarding the qualitative analysis performed, there are a lot of conclusions that can be withdrawn and go with accordance to the literature review. All the subjects only see cryptocurrencies as a way of investment and making money (profit). There are not more applications to this coin when talking about individuals. It is also perceived that in the short-term future, this tendency will not change. Still referring about the investment scope, all subjects agree that cryptocurrencies have a very high volatility, which can be confirmed by the graphic display in the literature review.

All the interviewees believe that because cryptocurrency is a Blockchain concept, then it is completely safe, there are no reasons to fear being scammed. However, investors do need to be aware of the best sites they can use to perform the needed transactions. These sites need to be safe and confirmed by the markets involved in order to not be hacked by the mentioned errors in the literature review.

Regarding the future, the subjects go with accordance to the idea presented in the whole dissertation, it is believed that in a long-term future, cryptocurrency will be used as a transaction coin and eventually, fiat currencies will become obsolete. However, their perceived value need to be sustained by something other than speculation. Regulations and ways to control these currencies need to be created, otherwise people will never feel safe with money in their accounts. Not because they are afraid of being hacked, but because they are afraid that the currency's value drop massively and consequently their buying power.

In conclusion and answering to the main question and objectives presented at the start, cryptocurrencies can be included in various markets, having as an example the Microsoft case, that uses this technology to gather information regarding their consumers. In the future, we will most likely see new ways to input cryptocurrencies in innovations, however as it stands the only market where it has an application is the mining of data. The current limitations have been exploited throughout the whole dissertation and the most important one, is the speculation around it. It is the only factor that influence the value of this coin, making it very volatile and difficult to predict. Another limitation that can be stated, is the switching costs associated with this coin, meaning that, since people are very used to fiat currency, it will not be easy to have a complete switch. As advantages and as referred from all subjects, it is a safe coin, that is not affected by countries, governments or crisis, it also does not have any costs on producing it

(contrary to the existed physical coinage). Another theoretical advantage and as mentioned in the literature review is the possibility of markets unification and how the world's economy could benefit from it.

The major benefits that cryptocurrencies can bring to our society is the fact that in a crisis, the coin would hold his value, as seen in the figure 1, making possible for people to not lose any buying power. In the current situation the world is living and as mentioned before, I strongly believe that in the case of a pandemic, the number of infections would not be as high as the reality if cryptocurrencies were the currency used as the trading of goods and services.

Regarding possible incorporations, I believe that in the short-term most websites could start accepting cryptocurrencies as a method of payment, that way everyone would be more inclined to acquire these coins and consequently, their value would be boosted. This incorporation is not far way since we are seeing companies like Google and banks like Revolut accepting transactions with cryptocurrencies, it is only a matter of time until other companies start accepting it too. The possible improvements can be measured in two different ways, one if companies adopt this incorporation and the second, if companies do not adopt it. The first one can be explained by the simple fact that a big part of the world's population holds a lot of cryptocurrencies due to investments made, however there is no place to spend it, the only action investors can then perform, is to resell these cryptocurrencies. But if a company, in their website, accepted for example, Bitcoins as a payment method for their products, then investors had another way to spend their cryptocurrencies, and consequently the sales would increase, even more so due to the new rise in online sales, because of Covid-19. The second improvement needs to be seen with another thought in mind: "What happens if a company does not incorporate this technology into their business?", the conclusion is not difficult to obtain, in can be compared to many incidents in the past. If a company starts to accept cryptocurrencies and another does not, then the first one will have a comparative advantage against the second. In conclusion consumers always search for the better choice, and if investors want to spend their virtual coins and the second company does not give them a way to use it, then the individuals will resort to the first company. Consequently, second company's sales will receive a high hit.

The final recommendations are mostly guided to individuals and not to collectives, since for the second, advices were already written above. Cryptocurrencies is still a very new concept, most people are not aware of it. It is not only pros associated with these coins, there are some nuances that need to be considered. The fact that the market is too unpredictable, it is not a safe

investment and sometimes, news do not show this existing and important con. To finalize, the current impact of the cryptocurrency in our society, is not much, virtual coins have not reached their full potential, however every day we take a new step towards a new globalization, a digital one, companies are getting aware of it and have started to make their first moves and eventually so will the society. With this idea present hopefully someone in a future far away can confirm it, since I believe that in my personal lifetime, I will not be able to do it.

REFERENCES

- Bajpai, P. (2020). How Central Banks Control the Supply of Money. Retrieved 13 October 2020, from <https://www.investopedia.com/articles/investing/053115/how-central-banks-control-supply-money.asp>
- Beattie, A. (2020). The History of Money: From Barter to Banknotes. Retrieved 15 November 2019, from https://www.investopedia.com/articles/07/roots_of_money.asp
- Bitcoin Price Index — CoinDesk 20. (2020). Retrieved 13 October 2020, from <https://www.coindesk.com/price/bitcoin>
- Deri, O. (2020). *Google Opens The Door To Mass Cryptocurrency Adoption*. Benzinga. Retrieved 29 October 2020, from <https://www.benzinga.com/markets/cryptocurrency/20/08/17160547/google-opens-the-door-to-mass-cryptocurrency-adoption>.
- Rocha, C. (2020). Criptomodas geram interesse, mas só um em cada dez sabe como funcionam. Retrieved 15 November 2019, from <https://insider.dn.pt/em-rede/criptomoedas-geram-interesse/>
- ElBahrawy, A., Alessandretti, L., Kandler, A., Pastor-Satorras, R., & Baronchelli, A. (2017). *Evolutionary dynamics of the cryptocurrency market*. Royal Society.
- EUR/USD (EUR=:Exchange). (2020). Retrieved 15 October 2020, from <https://www.cnbc.com/quotes/?symbol=EUR=>
- GBP/USD (GBP=:Exchange). (2020). Retrieved 15 October 2020, from <https://www.cnbc.com/quotes/?symbol=GBP=>
- Gil, E. (2020). Cryptocurrency's role in the future of money | Elad Gil | Big Think. Retrieved 15 November 2019, from <https://www.youtube.com/watch?v=OMmmtFIKBCY>
- Motsi-Omoijiade, I. (2018). *Handbook of Blockchain, Digital Finance, and Inclusion, Volume 1* (p. Chapter 9). Elsevier Inc.
- Helms, K. (2020). Microsoft Patents New Cryptocurrency System Using Body Activity Data. Retrieved 30 October 2020, from <https://news.bitcoin.com/microsoft-cryptocurrency-system/>
- Olshansky, S., & Wilson, S. (2018). *Do Blockchains Have Anything to Offer Identity?*. Internet Society.
- Uncharted territory: why consumers are still wary about adopting cryptocurrency. (2020). Retrieved 1 November 2020, from <https://www.kaspersky.com/blog/cryptocurrency-report-2019/>
- Varoufakis, Y., 2019. *Talking To My Daughter: A Brief History Of Capitalism*. 1st ed. Great Britain: Penguin Random House UK.
- Vyas, C., & Lunagaria, M. (2020). *Security Concerns and Issues for Bitcoin*. Citeseerx.

ANNEXES

As mentioned in the chapter “field of work”, the interviews were produced in Portuguese, for better understanding, a transcription of all engagements in the original language is accessible below. The current chapter will be divided in the following steps:

- First: A presentation of all the questions used in the interviews, since they are common to all subjects.
- Second: All the answers from each subject is shown with the correspondent division.

As already mentioned the questions will be presented in Portuguese below:

- **Primeira questão:** tem conhecimento do conceito da criptomoeda?
- **Segunda questão:** teve algum tipo de contato com este tipo de moeda? Se sim, qual foi a natureza do contato? Se não, tem alguma razão especial para tal?
- **Terceira questão:** qual foi o seu incentivo para iniciar o referido contato e qual o seu feedback após a experiência?
- **Quarta questão:** na sua opinião vê a criptomoeda como uma inovação segura ou como algo teria receio em investir?
- **Quinta questão:** acredita que é possível viver numa sociedade cuja moeda de transação seja a criptomoeda, podendo assim substituir na totalidade as moedas atuais?

Hopefully these questions help the readers to clear existing doubts and to promote some discussion regarding this theme.

Now the exhibition of the answers will take place separated by each subject, starting by the first one.

FIRST SUBJECT

- **Primeira questão:** Sei o que é a criptomoeda, no entanto nunca estudei o tema, nem tentei aprofundar muitos conhecimentos. O contato que tive foi maioritariamente através de notícias e de conversas não formais entre amigos.
- **Segunda questão:** Nunca transacionei qualquer tipo de criptomoeda. Apenas tenho uma ideia no que se baseia e de como tem sido falada a evolução do valor das mesmas.
- **Terceira questão:** Neste caso não se aplica a questão 3, pois o sujeito não teve qualquer contato com moedas virtuais.

- **Quarta questão:** O problema fundamental que vejo no investimento em criptomoeda é a diferença que perceciono entre o valor real e o transacionado. Ora a transação de criptomoeda a meu ver baseia-se numa transação de ativos no mercado de valores mobiliários, e como em qualquer mercado está dependente da lei da oferta e da procura, no entanto tem duas grandes diferenças face a outros títulos também transacionados. O primeiro pode ser apresentado com o exemplo de qualquer tipo de ação, opção ou outro título que diga respeito à transação de parte de uma empresa e que, de forma direta lhe corresponde uma parte de ativo. Ou seja, o valor pago pelo título indicado deverá ter correspondente uma parte que por si gera riqueza na economia, de forma simplificada, a produção e eficiência da empresa. No segundo ponto do meu raciocínio temos o caso das transações no mercado cambial em que a base das alterações é a política monetária vigente para a moeda em causa, bem como a estrutura económica que a sustenta. Ambos pontos que não consigo ver na criptomoeda e que, adicionalmente à falta de regulamentação me levam a pensar que o valor existente é puramente especulativo face a uma oferta limitada e que, como tal, se nunca for aceite na sua generalidade pelas sociedades, pode colapsar. Contudo há certas tecnologias associadas ao desenvolvimento da criptomoeda que me parecem ter uma grande oportunidade de desenvolvimento, quer para mercados financeiros quer para outros setores (Blockchain).
- **Quinta questão:** Uma resposta imediata seria não. No entanto, especulando a muito longo prazo (talvez mais de 30 anos), a evolução mundial e a globalização têm cada vez mais tornado as economias mais próximas, sendo que hoje em dia já utilizamos o dólar americano para grande número de transações internacionais mesmo que a moeda quer do país de origem quer do país de destino não seja essa. Isto, a meu ver, deve-se à segurança que quer a política monetária quer a economia sustentam aos olhos de todo o mundo. E como tal não me custa assumir um mundo que a pouco e pouco, com alguns avanços e recuos siga no sentido de cada vez ter uma moeda mais una, ainda que atingir a moeda única seja muito difícil em termos geopolíticos pela “bipolarização” de poderes que tem perseguido a história moderna do mundo, vejamos a China e os EUA. Adicionalmente, caso a criptomoeda chegue a um ponto em que grande parte das organizações e países aceitem a moeda como pagamento penso que será possível. No entanto acabará por ser um género de euro para a UE e não a hype atual.

SECOND SUBJECT

- **Primeira questão:** Tenho.
- **Segunda questão:** Já tive. Decidi investir em duas criptomoedas, bitcoin e litcoin. Achei que era um mercado demasiado volátil em que podiam haver perdas muito facilmente.
- **Terceira questão:** Na altura a criptomoeda estava na moda, pelo que decidi investir. O meu feedback é que para quem é “risk lover” pode ser um mercado interessando, mas terá que ter sempre uma grande banca de proteção.
- **Quarta questão:** É algo que tenho receio em investir. Não só pela sua volatilidade, mas também pelo pouco conhecimento que tenho da mesma e da possível “bolha” que poderá rebentar.
- **Quinta questão:** Não acredito que isso possa acontecer, pelo menos num curto prazo. Apenas num futuro muito distante, daqui a bastantes gerações isso possa ser possível. Primeiro porque o conhecimento sobre a criptomoeda não é muito e muitas pessoas não sabem sequer o que é. E depois porque a moeda física como a conhecemos hoje está implementada há anos e anos, pelo que nunca será fácil substituí-la.

THIRD SUBJECT

- **Primeira questão:** Sim é uma moeda virtual que está armazenada em base dados na cloud.
- **Segunda questão:** Não tive contacto com a moeda pessoalmente, mas já ouvi falar em notícias, que é uma moeda que tem vindo a ganhar um grande valor a nível de ações (stocks). E poderia adquirir ou investir nela através do banco revolut.
- **Terceira questão:** Tive incentivo por parte do banco revolut, mas não cheguei a adquirir, neste momento apenas a vejo como um investimento em estilo de ações e não para uso como moeda de troca/compra.
- **Quarta questão:** É uma mistura de sentimentos, por ser algo novo tem-se receio em investir porque não se tem uma base sólida nem de fidedignidade se é algo totalmente seguro, no entanto é uma moeda que tem se mostrado cada vez mais forte e intemporal não dependente de qualquer país/estado/metrologia/política, daí que não auxilie tanto como uma moeda física de um país que depende da sua economia, e pelo contrário a Criptomoeda tem vindo a ganhar cada vez mais valor e adesão.

- **Quinta questão:** Sim, acredito isso ser possível porque atualmente a moeda física está cada vez a ser menos usada, e com o covid-19 tem-se usado cada vez mais os cartões de crédito, que têm basicamente o dinheiro virtual por assim dizer (não o vemos), o que acaba por ser como se fosse a criptomoeda, algo virtual e que muitas vezes passa pela nossa conta bancária sem vermos/tocarmos. Se a criptomoeda começar a ser cada vez mais aceite como moeda de pagamento, acho que poderia facilmente se tornar uma moeda única e com maior fidedignidade em não poder falir, pois não depende da economia de nenhum estado, seria uma moeda totalmente independente.

FOURTH SUBJECT

- **Primeira questão:** Sim, há vários anos, talvez desde 2015.
- **Segunda questão:** Sim, procurei bastante informação sobre o tema, li livros e fiz trading durante um breve período. Neste momento tenho algumas cryptos como investimento de longo prazo. Investi por, na altura, ter liquidez, e por acreditar bastante que é o futuro da economia mundial em 5-10 anos.
- **Terceira questão:** Iniciei o contacto por curiosidade sobre o tema e por recomendação de amigos próximos. Desde então já recomendei o tema a várias pessoas, por isso o feedback que posso dar é positivo.
- **Quarta questão:** Regra geral é uma inovação segura, pela própria definição e sistema de funcionamento, e necessária. Outro tema é o investimento, que deverá ser feito através de casas de brokerage e trading "seguras" e confirmadas pelo mercado.
- **Quinta questão:** Sim, provavelmente já não será na minha vida, mas estou convicto que um dia, a moeda fiduciária será totalmente substituída por cryptos.

FIFTH SUBJECT

- **Primeira questão:** Sim.
- **Segunda questão:** Sim, investimento pessoal e aconselhamento de uma startup no espaço de criptomoeda.
- **Terceira questão:** O investimento pessoal deve-se à continuada valorização exponencial do valor da criptomoeda (Bitcoin), tendo passado de \$300 para \$9000 em menos de 5 anos. Outras criptomoedas apresentam um alto retorno de investimento, ainda que de risco acrescido. Importante de ressaltar que a criptomoeda é um

investimento com um risco bastante alto dada a volatilidade da mesma e a não indexação do seu valor a produtos físicos pelo que torna a sua evolução bastante imprevisível. Dada a volatilidade da moeda, o investimento em criptomoeda só é adequado a pessoas com perfil e capacidade de risco de médio a elevado.

- **Quarta questão:** A criptomoeda enquanto inovação é um conceito seguro. Investir num asset extremamente volátil inspira sempre receio.
- **Quinta questão:** É inevitável a mudança para uma moeda 100% virtual / criptomoeda. A moeda utilizada pela sociedade humana tem uma representação física com custo de produção e manutenção consideráveis e sem benefício aparente. A criptomoeda é de maior dificuldade de falsificar, mais segura de reter, global e totalmente distribuída. A sociedade caminha cada vez mais para a digitalização total de serviços e bens, portanto é inevitável que a moeda se torne também virtual.

SIXTH SUBJECT

- **Primeira questão:** Sim. O meu primeiro contacto foi por volta de 2009 com a Bitcoin e introduzida por colegas que à altura faziam mineração da moeda.
- **Segunda questão:** Sendo eu da área da informática, apesar de não ter tido um contacto direto, acabei por ter bastante contacto indireto. Isto porque diversos colegas faziam mineração e trading de Bitcoin. Pessoalmente nunca entrei nesse mercado pelo tempo/dedicação necessários, pois sendo um mercado demasiado volátil obriga a uma atenção redobrada para estar a par das melhores oportunidades.
- **Terceira questão:** Eu pessoalmente nunca tive grande interesse pela moeda, apesar de fazer interessante o desenvolvimento tecnológico na base. O facto de o mercado ser demasiado volátil e das criptomoedas em geral (na minha opinião) não possuírem uma base no seu valor a não ser a especulação, termina por me retrair evitando assim o meu investimento.
- **Quarta questão:** O conceito tecnológico que sustenta a transação (nomeadamente o blockchain) da moeda é seguro. Contudo, ao contrário de outros, eu pessoalmente não sou amante do conceito atual de criptomoeda. Isto porque a moeda em si não sustenta qualquer valor e o seu crescimento e valorização baseia-se em pura especulação.
- **Quinta questão:** Não tenho dúvidas que eventualmente acabará por ser. No entanto, ao contrário dos restantes participantes, não penso que será apenas uma questão de adoção (ou de vontade de adotar), são necessárias novas medidas e estratégias para definir o

seu valor, pois enquanto as moedas ditas tradicionais tem o seu valor na base do trabalho humano e metais preciosos, a criptomoeda tem no poder computacional. Nesse sentido, sou da opinião que com os avanços tecnológicos novas formas de sustentar o valor comercial de moedas irão surgir, como por exemplo o poder e horas computacionais necessárias para gerar determinada moeda. No entanto, vejo isso numa sociedade futura da qual eu já não farei parte.