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Blockchain and Digital Currency in the World of Finance

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Abstract

High-tech enables payment evolution and global competition. The ambiguities surrounding the digital currency still leave enough space for the analysis of its unreserved acceptance, trust and anticipation, which are the main driver for the spread of the network. Banks should carefully consider the technology underlying these cryptocurrencies as a potential generic new way of transferring ownership of the value over the long term. The chapter provides an analysis of the use of cryptocurrencies in general, especially Bitcoin as the technology adoption in the presence of network externalities. The objective attitude is the future of the digital currency in the moment is still unsolved issue due to the existence of “critical mass”. Further, the chapter explores financial privacy which is very sensitive issue in using digital currency (or cryptocurrency) and discuss about private choices versus political rules. The research has shown that the future of cryptocurrencies can be bright if some institutional-formal conditions are met due to the fact that success evolution of e-money requires building safety payments through three criteria—standardization, compatibility and innovation.

Keywords: Blockchain, digital currency, network externalities, critical mass, technology, payment evolution

1. Introduction

Electronic money is not a new phenomenon. Trade over the Internet has increased the use of new technologies, thereby increasing the demand for new electronic payment methods. What really is new is electronic payment in retail and use of the Internet as new monetary market. Today, money becomes ready information on the microprocessor or in the database. Without

a doubt, the purpose of such an instrument is to improve the efficiency of the traditional payment method. At this moment, there are still no clear standards in the Blockchain mechanism and therefore we do not know the boundaries, so participants can easily communicate without the presence of a regulator. Behind Blockchain technology is the universal Internet currency, which in turn raises many questions about the utilization of the advantages and risks/damages that would be arisen from the application.

High-tech enables payment evolution and global competition. But still the ambiguities surrounding the use of the digital currency leave enough space for the analysis of its unreserved acceptance, trust and anticipation, which are the main driver for the spread of the network. More precisely, the spread of the network requires interdependence of demand, which means the Network, must reach the minimum required volume before it reaches a balance. The minimum volume of the network is called “critical mass”. Therefore, the objective attitude is the future of the digital currency in the moment is still unsolved issue due to the existence of “critical mass”.

This chapter underlines the technology adoption in the presence of network externalities. Payment innovations that involve the creation of a network between the manufacturer and the consumer are product that inevitably involves network externalities that must touch the critical mass of the user before it starts to use it successfully. Network externalities exist due to the average consumer benefits from such an instrument, only if other consumers and traders use the same payment instrument.

Further, the chapter explores financial privacy which is very sensitive issue in using digital currency (or cryptocurrency). The analysis explores what are the private choices versus political rules. Success evolution of e-money requires building safety payments through three criteria—standardization, compatibility and innovation.

The diffusion that digital currency brings in the modern era expands the antitrust issues related to network externalities and global competition between most explored world currencies. This is the reason to include a review of social costs and benefits, as possible risks of using digital currency. These mean that in order to remain compatible with each other, all users should use software that meets the same rules. Therefore, all users and developers have a strong incentive to protect this consensus and set up a regulator.

At the end, the chapter examines the question—are there prospects of taking hand in hand the technology revolution and monetary evolution without risks in the real world?!

2. Overview of the IT revolution and innovations related to money

The online trade increased the use of new technologies, and thus increased the demand for new electronic payment methods. This began especially in the mid-1990s with the information revolution, the decline in computer prices and the networking of the same. Cohen introduces the term “change the geography of money” [1]. This term occurs as a result of the electronic payment in retail and use of the Internet as a new monetary market. Due to the information revolution, a new electronic payment method has been introduced, known as electronic

cash, e-bag, e-currency, digital currency, digital money or digital cash. Without a doubt, the purpose of such an instrument is to improve the efficiency of the traditional payment method.

Bitcoin is a digital currency whose value varies according to the worldwide customer acceptance. This is primarily due to the fact that, unlike the standard currencies we use, such as the dollar or the euro, which are regulated by central banks, for Bitcoin there is no regulation. Therefore, transactions with Bitcoin are considered more private and anonymous due to the open system and no existence of a regulatory body and/or intermediary in the performance of transactions.

Transactions are carried out using cryptographic protection, and their execution is done through a network of public electronic books called “ledgers”. For verification of transactions, it is necessary to have specific hardware and software that users can set up and after a certain number of transactions they receive a proportion of Bitcoin. In this way, it is also performed an additional commissioning of this digital currency.

2.1. Development of e-payment and digital currency

From the aspect of the development of e-payment method, digital currency is not physically printed by the Central Bank. For now, digital currency is considered with its own rules of the game. In the literature, all those who support the use of Bitcoin underscore the characteristic as a currency that does not cause financial crises. Namely, the view is that banks can print more money to cover their national debt, thus devaluing their currencies, Bitcoin does not function in such a way.

Electronic payment method exists from the 1960s, i.e. from the development of Electronic Funds Transfer (EFT), which became more sophisticated and applicable in a growing number of countries [2]. EFT implies the application of computer and telecommunication technology in payment. This method was used by banks and other financial institutions to exchange and transfer a large amount of money on a national and international level. The basis for the operation of EFT is that the money moves through a network as a substitute for cash or checks to execute a transaction. In this way, the time for paying should be shortened and the transaction costs reduced. The use of EFT has significantly increased with the emergence and acceptance of ATMs, which allow money transfer at the point of sale (EFTPOS). EFT is considered as first degree in the electronization of transactions.

In the early 1980s, thanks to the development of network technology, the costs of telecommunications and data processing were reduced, and electronic payments became more useful with the appearance of credit and debit cards, which for several years (after their appearance) became the most popular electronic small transaction tool. Also, the development of encryption has played a major role in successful card payments. This innovation is considered as a second degree in the electronization of transactions.

The growth and acceptance of card payments had negative consequences for the traditional way of payment. Many countries have made a move from the use of paper instruments, such as cash and checks, to the use of electronic instruments. For the first time in many countries, the number of checks payments has been reduced. Namely, checks as a very popular payment instrument loose the market role, thereby reducing their use [3].

2.2. e-Payment and transaction costs

In classical trade payments require at least one buyer and one seller, both having to have accounts in banks that are connected through clearing houses. Payments with traditional instruments such as checks require intervention of a financial intermediary like bank. Payment with e-money is similar to the traditional scheme—there are two parties—one or two banks. However, the whole process becomes more efficient and easier. The transaction does not require any code and cannot exceed the previously defined amount. If the amount that is on the chip is fully spent, the card can be automatically refilled at the merchant, without charging any fees, thanks to the special POS mechanism [4].

Once the chip is full, the user does not need to require an ATM or an exact amount of cash. Additionally, the problem of stealing or losing money is reduced to a minimum. An e-money transaction does not require an intermediary at present because the money expressed in units (called bits) is electronically transferred from the buyer to the seller. The amount of money that has been paid is prepared at the seller's terminal, i.e. his account is transferred to the financial institution from time to time.

Payment with e-money reduces transaction costs, and time is shortened compared to other forms of payment. Humphrey and colleagues estimate that the cost of using electronic money amounts to one third to half of the cost of paying paper money. When all transactions in one country would be carried out electronically, it would be possible to save more than 1% per year BDP.

2.3. A brief history of digital currency

From the era of barter economy, metal and coins to gold and silver, continuing to the modern monetary systems and checks, and ending with the latest developments in the global currency, such as the introduction of cryptocurrency like Bitcoin, have passed centuries. Each type of money plays a crucial role in transactional activities in some period of time. As human society and markets developed in particular, there was a need for more sophisticated instruments for the exchange of goods. In this regard, the introduction of cryptocurrency revolutionized the international payment system in a size that only a few years ago was unimaginable. The cryptocurrency is a digital or virtual currency that uses cryptography for security. Cryptocurrency is hard to forge because of this security feature. The determining characteristic of cryptocurrency, and probably the most attractive, is its organic nature as the fact that it is not issued by any central authority. Cryptocurrencies have their own advantages and disadvantages. The main benefits of using cryptocurrencies are that they transfer the funds more easily between two parties in the transaction [5]. These transactions are facilitated through the use of public and private keys for security purposes. These fund transfers are carried out with minimal processing costs, allowing users to avoid the large fees for online transactions charged by most banks.

There are two reasons for the emergence of electronic money and digital currencies. The first, according to the Austrian School of Economic Analysis money is a “social institution” subject to the already initiated institutional change and is interpreted as a consequence of a spontaneous evolution that should overcome the shortcomings of the swap and the double coincidence of desires [6, 7]. Today e-money is the last stage of this development and represents an additional degree of institutional change [8].

Their main role is to support online e-commerce, enable transactions, reduce their costs, or replace the payment of money and coins in retail. The second reason for the emergence of e-money is the information revolution, which is characterized by the integration of electronic information processing and telecommunication technologies, which reduces the geographical differences by means of which information can be transmitted to the whole world. The information revolution has changed the financial sector, making payment modes more secure and more efficient, giving an additional reason for the emergence of new monetary innovations [9].

Unlike the information revolution, the emergence of e-money is a new way of processing information for transferring purchasing power. Many financial innovations are not a new form of money, but a different way of using existing money in transactions [10]. Regardless of the consequences of the mentioned technological development, the nature of the money is still identical i.e. money serves as a means of exchange, as an asset and as a value. The nature of the money will never change, so the money will remain only an intermediary in the exchange of goods and services. e-Money card is a different payment method that allows electronic transfer of the value from the card to the terminal or from the card in the wallet, both in real time and through networks [11]. It is considered that e-money is the most important achievement that transfers the predetermined monetary value so it can be used for more transactions of lesser value. e-Pocket consists of a microcomputer that contains information about the monetary value that can be used. It is a higher degree of technological development compared to magnetic tape cards. Also, the e-pouch is more secure, which can reduce deception because cards with a chip can be more difficult to abuse than magnetic tape cards.

2.4. Reasons for Blockchain occurrence

Although cash is a quick and efficient payment method, the disadvantages of its use are numerous. Keeping cash is followed with many costs, including fraud, money loss, depositing, as well as the costs associated with managing money in financial institutions.

The purpose of e-money is replacing the cash in transactions of small values, thus avoiding its shortcomings, for example French experience with Moneo. Moneo is designed to reduce the cost of keeping cash and purchasing power to be temporarily transferred in a more efficient manner. This structure should be applied to various retail transactions of lesser value in order to eventually become a substitute for cash.

Moneo offers great advantages for consumers and retailers. Benefits for consumers are: greater transaction speed and potential benefit in the form of a discount on future purchases. Consumers do not have to have an exact amount of cash each time. There will be many mistakes in cash recovery. The owners of the Moneo card should carry fewer bank cards, especially if the features of debit and credit cards are included, and thus they would feel more secure [12]. Traders would receive cash before sending material goods or services, loyalty to customers would increase, the process of payment at the place of purchase would be speeded up, thereby reducing the processing costs of the transaction itself. If the benefit of using Moneo cards would be greater than the cost, retailers could pay to customers to use such a card [11].

If we make comparison between Moneo and POS, it turns out that the former has significant advantages over the POS. Namely, debit and credit cards are not as effective a payment method for low value transactions as transaction-related costs become higher for retailers

and buyers, and e-money can be used with much lower costs. Paying for e-money is followed by much lower costs compared to other payment methods, primarily credit and debit cards. Another argument that accompanies the Moneo card is that it has a newer encryption technology compared to other cards, which increases security and limits the possibility of fraud. Because Moneo does not require any authorization or identification of the buyer, it allows additional reduction in transaction costs. The new technology of digital payments and currencies will allow real property to be used as a means of exchange.

How much e-money will be used depends largely on the motivation of its publishers, consumers and traders [13–15]. Consumers' demand will depend on the advantages and disadvantages of e-money in the form of payment, issuers' fees, consumer confidence in the use of e-money, ease of use, merchants' readiness to accept e-money. Motivation for the issuers covers the revenues from the collected fee from card users (traders and consumers), income from investing the remaining amount of money, i.e. for banks—issuers, savings of less retained cash, in the range in which e-money replaces cash). Potential shortcomings for publishers can be expected costs for future regulation. The willingness of retailers to accept e-money is closely related to the fee that will be charged by publishers or operators. For consumers and retailers the most important will be their willingness to embrace new technology. Most researchers believe that the use of e-money will be moderate in the short and medium term, while in the long run e-money can be very widespread.

3. The potential of cryptocurrency

There are different and confronted opinions regarding the future of cryptocurrencies in general. The optimistic view of the use of cryptocurrencies is supported by the fact that they easily transfer funds between two parties in the transaction. These transactions are facilitated by the use of public and private keys for security purposes. These fund transfers are made with minimal processing costs, allowing users to avoid large fees charged by most banks. In addition, many countries have begun to accept Bitcoin as a valid currency. In particular, countries that aim to get rid of cash have a very friendly approach to encryption. The argument that the promoters use for Bitcoin is the market capitalization of Bitcoin, ether and other cryptocurrencies, claiming that the cryptocurrency market has become very large and powerful, and the ban would be expensive for each country. Today, the total value of all cryptocurrencies has reached a record of value of more than \$ 390 billion. This means that the market value of cryptocurrencies is greater than the value of the Citigroup. The new record was reached in December when the most famous cryptocurrency Bitcoin grew to \$ 19,000.

Among other significant cryptocurrencies are Ripple and Ethereum. The cryptocurrency Ripple, designed for banks and global money transfers, has seen a major feat in the value of its digital currency that has risen in recent months. On December 10, the company had a market capitalization of just over \$ 9 billion. In the end of December, its market value rose to a mere 51%, with a total value of \$ 18.1 billion. Today it is worth \$ 39 billion. Ripple's cryptocurrency is adopted by banks and other financial institutions. These companies believe that Ripple's system offers better prices and is more secure than other digital currencies, including Bitcoin. It allows users to send, receive and hold any currency in a decentralized way through

the Ripple network. The company has a positive cash flow relationship and owns a huge shop on the XRP (Ripple Market), which is periodically released on the market. Investors who believe that cryptocurrencies can reach peak, are looking for others that could provide a greater return in the long run. However, the company has made some significant milestones in recent months. By the end of October 2017, Ripple licensed its Blockchain technologies to more than 100 banks. Its real attraction is the Ripple XRP system, which is ideal for banks because of its liquidity, speed and efficiency since the transaction lasts only 4 seconds, like no other cryptocurrency transaction.

However, the support for cryptocurrencies like Ripple is certainly superfluous and is something that should be understood by potential buyers and sellers because it gives those financial institutions a much higher level of control over Ripple than most other cryptocurrencies in the market. Bitcoin, Ethereum and other cryptocurrencies are completely decentralized, meaning that no one has real control over the network, Ripple's nodes are handled by Ripple Labs. These independent servers do not have to provide calculations for work evidence, such as Bitcoin, nodes simply validate transactions by themselves like traditional banks. Although the value of the Ethereum is not like Bitcoin, it is great for trading, and some of its more advanced features give exciting potential for the future.

Ethereum functions as well as most other cryptocurrencies. Ethereum token—Ether, works similar like Bitcoin. You can buy and sell with confirmation of transactions that are handled through the block. It is completely decentralized, without bank securing of the certificates needed to check the transactions. "Diggers" around the world fulfill this role by running powerful calculation algorithms. Completing these algorithms, the job is rewarded with Ether, much like digging a Bitcoin that rewards with Bitcoin. As far as Ethereum and Bitcoin have some similarities, however, both platforms have different goals. Bitcoin is a strictly digital currency, designed to function as a means of payment or a warehouse with value, Ethereum takes a greater approach. Ethereum functions as a platform through which people can use ether tokens to create and execute applications and more importantly smart deals. Smart contracts are contracts written in the code, which the creator transfers to the block. Each time one of those contracts is executed, each node of the network executes it, set to Blockchain [16]. Thus, it is preserved in the public book, theoretically protected from evidence. Like other cryptocurrencies, Ethereum is prone to wild fluctuations in value. While Ethereum has risen high late, it is also susceptible to falls as well as other cryptocurrencies. Ethereum whether it is strong enough to survive a long run, or is a short-lived trend, remains on time.

From here we will conclude what are the advantages of the cryptocurrencies [17]:

- No inflation—the maximum number of coins is strictly limited (for example, 21 million in Bitcoin). Since there are neither political forces nor corporations that can change this order, there is no possibility of developing inflation in the system.
- Peer-to-peer cryptocurrency network—in such networks there is no master server, which is responsible for all operations. The exchange of information (in this case—money) is between 2 and 3 or more software customers. All installed by programmers-users who are part of the network. Each client stores a record of all transactions executed and the number in each wallet. Transactions are made from hundreds of distributed servers. Neither banks nor taxes, nor governments can control the exchange of money between.

- Unlimited possibilities for a transaction—each of the wallet holders can pay to everyone, anywhere and any amount. The transaction cannot be controlled or prevented, so you can make transfers anywhere in the world wherever a user is placed with a wallet.
- No borders—payments made in this system are impossible for cancelation. Coins cannot be forged, copied or spent twice. These opportunities guarantee the integrity of the field system.
- Decentralization—there is no central controlling authority in the network, the network is alluded to all participants, each computer crypto-valued member is a member of this system. This means that the central government has no power to dictate rules to cryptocurrency owners. And even if some part of the network goes offline, the payment system will continue to function steadily.
- Anonymity—completely anonymously and at the same time completely transparent. Each company can create an infinite number of crypto address addresses, regardless of name, address, or any other information.
- Transparency—Bitcoin stores the history of transactions that have ever happened. It is called a sequential block of blocks or a blockhead. The block keeps information about everything. So, if the company publicly uses the Bitcoin address for example, then everyone can see how much Bitcoin is owned. If the address of the company is not publicly confirmed, then nobody will ever know that it belongs to this company. For full anonymity, companies use the unique bitcoin address for each transaction.
- Bitcoin's open digging code applies the same algorithms used in online banking. The only difference in online banking is the disclosure of information to users. All information about the transaction in the BTC network is shared (like, when), but there is no data for the recipient or the sender of the currencies (no access to the owner's personal data).
- Transaction speed—the ability to send money everywhere and everyone within minutes after the network of the crypto-currency will process the payment.

4. The omission and risks of cryptocurrencies

Cryptocurrency opponents argue that cryptocurrencies are highly unstable, can be used for money laundering or financing illegal activities. In this regard, Humphrey, for example, is giving reasons why the cryptocurrency is not a viable electronic currency [18]. He notes that Bitcoin is illiquid and has shown price volatility and that the discounted monetary value of Bitcoin is zero. Further, he notes that the currency does not have a central issuer, and that there is no financial or economic basis for its creation. They are:

- Strong instability—almost all the ups and downs of the value of some cryptocurrencies. This instability creates the problem in the short term.
- Difficult to understand—crypto-valves are relatively new and come with a learning curve. People end up investing without proper knowledge and are losing money for something they have not learned.

- Lack of knowledge—people are not aware of how to use cyberattacks and hence be exposed to hackers. The technology is somewhat complex and therefore we need to educate ourselves before investing.
- There is no way to cancel the payment—if you're mistaken for someone using the cryptocurrency, then there is no way to get a refund of the amount paid. All you can do is asking the person to return the funds and if your request is denied, then just forget the money.
- Major risks for investing in cryptocurrencies that need to be considered in the medium and long term.

Many experts believe that the list of deficiencies in crypto-voltages is much longer and related to the risk of money laundering, terrorist financing and other illegal activities, the lack of a central publisher, which means that there is no legal formal guarantee person in the case of bankruptcy, and the like. Although it is very difficult to predict, many academics and professionals in this topic argue that the future of cryptocurrency is bright because it will remove trade barriers and intermediaries, reduce transaction costs, thereby boosting trade and the economy.

5. Anticipation of Bitcoin acceptance and “critical mass”

Analyzing the process of money accepting, shows that money is usable as individuals believe that others will be used them for different needs in society. Krueger believes that individuals will accept the e-money system as long as its value is compounded and not reduced drastically [19]. The fact that the individual accepts the money stems from what others accept. Anticipating factor is the key determinant of accepting money. Acceptance, trust and anticipation are the basic factors that enable the spread of the network. However, these factors are not enough because the size of the network also requires interdependence of demand, which means that the network must reach the minimum required size before it reaches a balance. Economides and Himmelberg such a minimal magnitude of the network determinate as “critical mass” [20]. Oliver defined the critical mass as “a smaller segment of the population that wants to make a big contribution to collective action, while most work little or nothing” [21]. A critical mass or starting base plays a key role in the development of the network.

Electronic money cards, like other innovations that involve creation of a network between the manufacturer and the consumer, are a product that inevitably involves the network externality must touch the critical mass of the user before starting to use it successfully. The indicated phenomenon in literature is called a two-sided market. The development of the payment instrument first depends on two types of externalities associated with their application and use. The outsourcing of the network exists because the average consumer benefits from such an instrument, only if other consumers and traders use the same payment instrument. Additionally, the total benefit from the use of e-money card exceeds the usage limit realized by the individual consumer. By accessing one user to the network, the benefits for other users are increased.

Thus, the user's critical mass will be achieved when the demand-side dependency between retailers and consumers will not be more economically significant, i.e. when the expectations

of the consumer benefit will not significantly change depending on the new members of the network [22]. Consumer benefits will increase when more merchants accept the new payment instrument, while the commercial benefit will increase if consumers use the new instrument more often. Additionally, the attractiveness of such an instrument can be reduced due to the incompatibility and competitiveness of the composition, as in the case of video recorders a few decades ago [23].

The use and distribution of the network is a complex issue because the interdependence of demand will remain an obstacle until the network reaches a critical mass, either independently or with the help of a regulator. According to the analyses of Katza and Shapira the growth of the network in its nature can be self-fulfilling [24]. Accomplish a critical mass in using Blockchain is not easy because traders must invest in special POS devices to be able to use e-money; and consumers will have to use e-money in a retail transaction as a substitute for coins and paper money. The goal of this problem is to convince a large number of users to start using e-money.

One of the reasons that few people use this payment method is precisely the habit of using cash for a retail transaction. At the same time, the banks' habits in carrying out a transaction may be the reason for the slow implementation of new insurances. Consumers gained confidence in financial intermediaries over time, and therefore did not get used to doing a transaction without their presence. Therefore, consumers are not ready for change. More consumers need more time to get to know the functioning of the new payment system. Accordingly, most of them would look forward to seeing the development of the situation because they want to gain more confidence before accepting innovation. As each phenomenon goes through stages of development, it is possible to expect further progress and an economy without cash using the digital economy.

6. Technology adoption in the presence of “network externalities”

The use of e-money is a complicated phenomenon and firstly depends on the interactions between users of products and services.

According to Schmalensee the network can be defined as a composition of directly or indirectly coupled nodes [25]. Schmalensee considered that the main hallmark of the network is the fact that there is a network externality. The above concept is often applied in economic literature; also often appears in the literature on industrial organizations and public finances [20, 26].

From a user's perspective, Bitcoin is a mobile application or a computer program that provides personal money, Bitcoin, and allows users to send and receive Bitcoins through them. This is the way how Bitcoin works for the most users. The network of Bitcoin is sharing a public book called “block chain”. This book contains any transaction ever processed, allowing the user's computer to verify the validity of each transaction. The authenticity of each transaction is protected by digital signatures and corresponds to the sent address, allowing for all users to have complete control over the sent Bitcoins from their own Bitcoin addresses. So, anyone can perform processing of transactions using computer with specialized hardware, and earn Bitcoins for this service.

The term “network externalities” refers to the product or service to get better value for consumers, as many people use them and thus continuously increases the number of network

users (a significant proportion of the value of the products or network refers to its other participants). This concept has positive spiral. It is often mentioned in relation to products used in digital technology, i.e. with products whose use significantly increases with the increase in the number of consumers.

Farrell et al., for the first time presented the Economic Analysis of the Network Outsourcing [24, 27]. They classified the network externalities into two groups-direct and indirect. Direct network externalities exist when increasing the size of the network increases the number of other users with whom it can be completely “communicated”. In such a network there are inactions and complementarity between users of the same product or service. Indirect network externalities exist when increasing the size of the network increases the supply of products or services available for network users.

Network externality introduces dynamic elements for network users when deciding on entering the network, as well as for manufacturers of such products when making a production decision [16]. Consumers in the decision to enter the network must take into account the size of the network for the future. The companies are motivated to invest in building a network from which they would make a lease later.

7. Financial privacy: could Bitcoin hide the criminals?

Five years ago Bitcoin showed the opportunity for being anonymous. But this is changing starting with Federal Bureau of Investigation (FBI) and other law enforcement, for example. The biggest part of Bitcoin users are law-abiding people motivated by privacy concerns. Also there are people that see the anonymity as a tool for financial crime. This was a reason to show attempt for virtual currency regulation. It's well known that Governments are grappling with the virtual currencies as it continues to gain popularity. So, in 2013 the U.S. Department of Treasury issued Guide how to use digital currency and money transmitters. In that time was taken some steps for Bitcoin regulation, meaning that cryptocurrency should be threaten as a taxable property. Conducting transactions in digital currencies has emerged as one of the preferred payment methods because it provides anonymity and privacy. At the begging as it previous mention in the text, digital currency was subject of interest for criminals.

Bitcoins are transferred between transacting parties without an intermediary, thus offering providing level of privacy and anonymity. A public ledger contains the transactions as cryptographic representations, but no personal information is recorded. Exchanging Bitcoins in a transaction is much like exchanging cash, but through the Internet. In attempting to regulate digital currencies is that doing so dismantles a technology that fosters privacy. Regulation erodes the privacy linked with digital currency. Think of it as transacting in an account that is protected by strong secrecy laws. In order to regulate those transactions, the system has to eliminate the secrecy. Regulation of digital currencies would undermine the system as an enabler of privacy and reduce its appeal. Users who seek the opportunity of privacy in digital currencies will look to other venues to conduct their business, in countries with less regulation. But the consequence of regulation of digital currency will be enabling privacy violations

because in such a circumstances business and individuals have to share information with the government and others [28]. These potential risks of having no regulation for digital currency distract many users in the world because there is no confidence [29].

A regulatory framework for digital currencies is more than need for public protection and combating criminal activities. However, caution should be exercised to avoid stifling the development of an innovative technology. Regulation of digital currencies should be sufficiently balanced with privacy, business development and innovative technology.

8. The way forward: technology revolution and monetary evolution

8.1. Key success factors

The current cryptocurrency market is highly competitive and fragmented. Experts identified more factors that will determinate and rise the attractiveness and confidence in using cryptocurrency [30]:

The cryptocurrencies should be:

- Cost effective to issue
- Available immediately
- Governed and regulated
- Instantly liquid—liquidity should be instantly generated or generated on demand
- Secure and immutable—cannot be double spent
- Trusted—backed by a lender of last resort (e.g. a central bank)
- Free from fractional reserve banking in its crypto-form
- Transparent with transaction finality (directly or remotely)
- Add purpose to economic activity (commerce) and have sustainable value
- Have standards to enable interoperability
- Be legitimate—a competent authority to impose these standards

Cryptocurrencies will undoubtedly benefit market participants.

The benefits include [10, 29]:

- Immediate asset availability—the cryptocurrency will be available immediately for consumers and businesses to spend, without any waiting period.
- Immediate access to liquidity—the cryptocurrency will be highly liquid—liquidity generated instantly on demand.

- Free up working capital—the need for banks to hold reserves will be minimized as the money held for use as reserves will be available for other purposes thus optimizing intra-day liquidity.
- Transaction efficiency—cryptocurrency transactions are fast and immediate—they improve efficiency by cutting out the middle man and avoiding lengthy back-office reconciliation processes.
- Transaction security—central bank-issued cryptocurrency transactions can be tracked protecting security. Security is also enhanced as there is no double spending.
- Over and above these benefits, a central bank-issued cryptocurrency can have a much larger impact on the wider economy and for all market participants because it can:
- Boost economic growth—a central bank issued cryptocurrency can permanently boost economic growth.
- Act as an enabler for mobile and digital commerce—it can replace current immediate payment models by delivering the currency into the market in a more immediate, efficient and effective manner.
- Ensure stability in the financial system—a cryptocurrency can help maintain financial stability and provide policy makers with more effective tools to smooth out financial booms and busts. In periods of high inflation for fiat currencies, banks can hold cryptocurrencies, thus protecting their wealth.
- Work as a crypto-reserve currency—commercial banks can keep a portion of their reserves in cryptocurrency rather than in fiat currency, thus complementing the fractional reserve banking system.
- Effectively monitor the supply of money—a central bank issued cryptocurrency can help policy makers control the amount of money in the economy, as well as the supply of the cryptocurrency. This is currently not possible as banks create money by using deposits as loans.
- Lower costs—cryptocurrencies will enable the banking system to cut the costs of bank-note issuance, circulation and handling. In addition, transaction costs will be significantly reduced especially for cross border transactions.
- Allow for traceability—transactions in central bank issued cryptocurrencies can be tracked, and simultaneously ensure that the users information remains protected, thus protecting privacy. A central bank issued currency follows KYB and KYC procedures which will allow the central bank to identify users when there is a need to.

Taking in an account that in the world of digital currency is needed regulation, increasing the attractiveness of using cryptocurrencies is found in support by central bank. The central bank with its authority and confidence that it has from the market participants, needs to do some reforms in the moment of deploying a cryptocurrency [31].

At the beginning, central bank is the most relevant factor to define the framework and standards for all participants. Regarding this, central bank can create and give policy guidance

where all players will know policy and regulation very clear. Central bank following KYB and KYC procedures ensures control of financial criminal. In the moment when central bank issued cryptocurrency under legal framework it will have the status of legal tender.

The role of central banks raises more for all users in the economy. In the traditional way, central bank has no direct connection with consumers, which is a big difference when central bank issued cryptocurrency and has direct link with market participants.

9. Conclusion

The chapter was intended to provide an analysis for the use of cryptocurrencies in general and especially Bitcoin. The research has shown that the future of cryptocurrencies can be bright if some institutional-formal conditions are met. The advantages of using cryptocurrencies in trade facilitation, cost reduction and others are recognized by the majority of academics. Bitcoin and other cryptocurrencies have the potential to replace traditional and new payment methods. But in order to achieve this and become the dominant force in the global payment system, they must provide a distinctive individual value, deal with and overcome a number of critical challenges, such as formal regulatory issues. It is unlikely to happen in a short period of time. Also, banks should carefully consider the technology underlying these cryptocurrencies as a potential generic new way of transferring ownership of the value over the long term. On the other hand, we have seen that cryptocurrencies as a new rise in society constitute a new way of transparent and fluid flow of resources that can spur every economy.

The advances in information and communication technology enabled the development of new forms of electronic payment, both in the real world with card products and in the virtual world (software products). The reason for the growing prevalence of these products is precisely their great perceptions compared to the traditional way of payment. However, statistics confirm that the evolution of e-money is in the initial phase, and that cash is still the most important form of payment for retail transactions. Cash has not yet been replaced by any form of electronic payment. One of the reasons is precisely the fact that e-money is a rather sophisticated form of payment that requires some investment in new technology among retailers, as well as developing new experiences among the users. Therefore, the use of electronic money does not extend significantly.

Because Bitcoin is controlled by all users, and they are free to choose the software of their choice. Therefore, in order to maintain compatibility, users must change this, that is, they should use software that meets the same rules. Only Bitcoin can work properly with a complete consensus among all users. Ripple enabled us to look at how banks began to use it, in order to become more polyclinic in their work. The Ethereum has enabled us to get to know the extra possibilities of cryptocurrencies through Smart Arrangements. They could relieve individuals of the limitations of the legal system and big business.

Taking in account the success of cryptocurrencies, there is opinion that consumers, consortiums or large financial institutions would not be successful in launching cryptocurrencies. Further, here is believed that its success will be greater if the digital currencies are launched

by central banks. So, we should be thinking in using this tool more efficiency for the world economy, supportive than understanding them as possibility to disrupting the financial system. More detail, central bank has the authority to bring participants together and will increase the attractiveness of fiat money for exchange in clearing, payments and settlement. In this moment some experts asked two question according cryptocurrency and central banks. The first is linked with the deepness and preciseness of policy and economic implications of launching a central bank-issued cryptocurrency. The second issue is focused on impact of central bank-issued cryptocurrency on the banking system.

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