

Digital Currencies, Challenges and Opportunities

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Abstract— Digital currencies is a fast-developing topic in an age of communications revolution and E-commerce. In this paper we study the present situation and the challenges that affect in the crypto market. We first start by presenting a global overview of the digital currencies. Next, we detail the existing threats, risks and weaknesses of the digital currencies and Bitcoin in particular.

I. INTRODUCTION

Internet technology has not only changed the way we communicate with each other, but has also allowed the emergence of new platforms and online transaction that can radically change the nature of the way we regulate the exchange of goods and services. Initial messaging services have enabled potential buyers and sellers to communicate as well as arrange offline exchanges; improved encryption methods have enabled direct circulation of bank account details; increasing numbers of web users have facilitated the emergence of websites and services that rely entirely on online advertising revenue payment and enhanced messaging. The emergence of Internet-based businesses and the growth of online niche stores able to reach a wider market and leading e-commerce specialists such as Amazon and eBay. At the same time, innovations in payment platforms have reduced the role of currency, even on commercial streets.

Online sales have expanded significantly and payment with credit cards (such as Visa Card). Recently, digital currencies have emerged as another means of payment over the network, and the scope of using digital currencies is constantly expanding. Bitcoin is currently the most popular digital currency which we study in this paper.

The field of digital currencies has become a vital field and attracts many scholars and researchers. Many studies have been published dealing with digital currencies, several studies focused on the nature of digital currencies while other studies addressed the technical challenges and risks associated with trading digital currencies, a considerable number of studies focused on the analysis of the Bitcoin price index.

In this paper, we will study the challenges and opportunities for Bitcoin currency, and we will investigate the future of digital currencies in general and Bitcoin in particular. We will take into account the risks associated with cryptocurrencies and the concerns of governments and individuals about dealing in cryptocurrencies and indicate some solutions.

II. DIGITAL CURRENCY

2.1. What is digital currency?

The European Central Bank report defined digital currency as "a type of unregulated, digital money, which is issued and

usually controlled by its developers, and used and accepted among the members of a specific virtual community.[4]

Wikipedia's definition of digital currencies is: "is a type of currency available in digital form (in contrast to physical, such as banknotes and coins). It exhibits properties similar to physical currencies, but can allow for instantaneous transactions and borderless transfer-of-ownership. Examples include virtual currencies, cryptocurrencies, and central bank digital currency. These currencies may be used to buy physical goods and services, but may also be restricted to certain communities such as for use inside an online game.

Digital currency is a money balance recorded electronically on a stored-value card or other devices. Another form of electronic money is network money, allowing the transfer of value on computer networks, particularly the Internet. [9]

Digital currencies are supranational currencies that are completely different from conventional banking and are not subject to central bank control, nor do they need financial intermediaries to facilitate the exchange process. Therefore, they raise the concerns of many governments of the world as they are an appropriate means of financing suspicious organizations or to facilitate the process of money laundering, illicit trade and tax evasion.

Digital money is a new innovation commensurate with the evolution in the new life and as a result of the development in the field of communications in particular and the emergence of electronic markets, which created the need for a new form of money with sufficient flexibility to deal directly and without intermediaries.

It has become clear that digital currencies is going to be a real competitor for central banks fiat currency and that central banks face new challenges as digital currencies may strip them of their traditional function of issuing currencies and managing the banking process in the country as a sovereign matter.

The rapid growth of digital currencies has made central banking a rapidly evolving topic and is attracting more researchers and those interested in studying monetary economics.[3]

2.2. Digital currencies and the functions of money

Throughout history, money has three functions: a measure of value, a repository of value, an intermediary for exchange and the same for digital money. The difference is only in the nature of money and the method of transactions. The distinction between the definition of money, common functions of money, and characteristics of a good money matters for assessing whether an item should be classified as money. If an item meets the definition, then it is money. If it does not meet the definition, then it is not money. Whether it is capable of serving the other functions well might improve or diminish the likelihood that an item becomes money, but is irrelevant for the purpose of classification. All that matters for assessing whether an item is money is the extent to which it is accepted [3].

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Being electronic currencies operational from any device connected to the internet, cryptocurrencies can easily fulfill the monetary role of medium of exchange. However, it is one thing to technically fulfill that role, but finding demand for being used as a medium of exchange is a different question, enhanced by obtaining demand as a store of value or unit of account. Cryptocurrencies are currently wholly inadequate as a unit of account due to fluctuating demand and inflexible supply, and the absence of an authority that can manage the supply to maintain a constant value of the cryptocurrencies studied here, and arguably, of all cryptocurrencies, only bitcoin can attract demand as a store of value, due to the high degree of credibility and predictability to its supply, and the resistance to manipulation and resilience it has shown in eight years of existence. It is conceivable that Bitcoin will continue to attract more demand as a store of value and gain a wider role as a medium of exchange, but the same cannot be said to most digital currencies, which seem to offer no advantages as a store of value or unit of account, and so are unlikely to attract demand as media of exchange [1]. Yermack's view that bitcoin is not really money rests on the idea that a money functions as a medium of exchange, store of value and unit of account. "Bitcoin somewhat meets the first of these criteria", [6]. Dixon A Gardner's view that digital currency is a next generation product in payment systems but still the acceptance by governments of digital currency around the world as a new payment system is low [5].

2.3. Crypto capitalization

The crypto market witnessed significant growth in the past three years, many new currencies have emerged and the range of acceptance of digital currencies expanded, it is clear that this growth will continue for years to come as a result of similar growth in the e-commerce markets, the increase in the use of mobile phones and the ease of shopping online. Recently, the market capitalization exceeded \$ 191 billion, and Bitcoin dominates about 68.6%.



Source: coinmarketcap.com
Figure 1: Total Market Capitalization

Figure 1: shows the size of the cryptomarket capitalization at the end of December 2019, and the figure No.2 shows the size of the Bitcoin market capitalization in the same period.



Source: coinmarketcap.com
Figure 2: Bitcoin Capitalization

III. BITCOIN

3.1. What is bitcoin?

Reuben Grinberg's definition of bitcoin is a digital, decentralized, partially anonymous currency, not backed by any government or other legal entity, and not redeemable for gold or other commodity. It relies on peer-to-peer networking and cryptography to maintain its integrity, [11]. bitcoin was quietly introduced to the world in 2009 as not much more than an obscure piece of code. For more than a year after its introduction, each bitcoin in circulation traded for pennies as a community of coders made minor modifications and refinements to the open-source client at the system's core. Its value climbed to roughly \$1.00 by February 2011 and then to nearly \$30 four months later before settling down to an average of just \$8.16 from July 2011 to February 2012. After that, demand began to increase, (LUTHER, 2016). Bitcoin, the first cryptocurrency, is a decentralized form of digital cash that eliminates the need for traditional intermediaries such as banks and governments to make financial transactions (VOIGT, 2019). "What is needed is an electronic payment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party," wrote Satoshi Nakamoto - the pseudonym of the mysterious bitcoin creator, who remains unknown - in a white paper introducing the open-source technology [13]. Bitcoin is increasingly drawing public attention and moving more and more customers towards using this payment system in a variety of businesses. Fast, convenient, tax-free, and revolutionary are commonly used to describe Bitcoin [10]. Bitcoins are highly liquid, have low transaction costs, can be used to send payments quickly across the internet, and can be used to make micropayments [11]. WILLIAM J. LUTHER believes that If one is interested in switching to a cryptocurrency, Bitcoin is the obvious choice. It is the most familiar, so it enjoys relatively lower switching costs, and it has the biggest network [14]. Launched in 2009, Bitcoin is the world's largest cryptocurrency by market cap. Unlike fiat currency, Bitcoin is

created, distributed, traded and stored with the use of a decentralized ledger system known as blockchain. Bitcoin's history as a store of value has been turbulent; the cryptocurrency skyrocketed up to roughly \$20,000 per coin in 2017, but as of two years later, is currency trading for less than half of that. As the earliest cryptocurrency to meet widespread popularity and success, bitcoin has inspired a host of offshoots and imitators [12].

3.2. How to get bitcoin?

There are essentially three ways to procure bitcoins:

(1) by "mining" them; (2) by purchasing them; or (3) by selling something and accepting payment in BTC [4]. Mining is the act of creating valid bitcoin blocks, which requires demonstrating proof of work, and miners are devices that mine or people who own those devices [8]. A new block is successfully appended to the blockchain only if miner nodes validate them through solving a difficult proof-of-work (PoW) puzzle. The blockchain also allows for traversing these blocks to find the ownership of a bitcoin in an efficient way as blocks are saved in a given order. Moreover, manipulating blocks is impossible because tampering with only one block will modify the entire hash value of the block and the tampering will be detected since each single block contains the hash value of the previous one [10]. To control inflation by limiting the total number of bitcoins in existence, the rate at which new coins are generated will halve approximately every four years so that the total number of bitcoins in existence may never exceed twenty-one million. Thus, for the time being, the network is supported entirely by the creation of new bitcoins [4]. To purchase bitcoin, one only needs to set up an online account with an online exchange, make their request, and the transaction is usually completed in minutes. Once the bitcoin is in their digital wallet, they would be able to make purchases from thousands of vendors worldwide. In this example, Bitcoin is the more viable solution as quick entry and exit for a currency that can quickly gain value [2]. Bitcoins can be acquired in the stream of commerce (by exchanging goods and services for bitcoins) or as a reward for participating in "mining," the activity by which users update the network's "blockchain," or archive of previous bitcoin transactions. Bitcoins paid out as mining fees represent the seigniorage of new currency, which occurs at a fixed rate that periodically ratchets downward until it is scheduled to asymptotically approach no new money creation in 2140 [6].

The easiest way to obtain Bitcoins is to purchase them through an exchange. Though there are many exchanges, the underlying concept is simple: users can trade traditional currency (e.g., dollars, Euros) for BTC at the current exchange rate. Exchange rates are determined by supply and demand. Users may then store their Bitcoins in a wallet file on their personal computer or on the exchange's servers, giving them the ability to access their Bitcoins from any computer [4].

3.3. Legitimacy and legal situation

The peer-to-peer digital currency Bitcoin made its debut in 2009 and with it ushered in a new era of cryptocurrency. While tax authorities, enforcement agencies, and regulators worldwide are still debating best practices, one pertinent question: is Bitcoin legal or illegal? The answer – it depends on the location and activity of the user [7].

Bitcoin operates in a legal grey area, as it is a new technology, and legislatures around the globe are not known for their quick action, there are very few laws currently on the books that specifically address virtual currencies such as Bitcoin. Thus, an analysis of the legal nature of Bitcoin must consider whether any existing laws might be applied to this new situation. This analysis is naturally speculative, and one cannot know for sure how judges might ultimately rule. Nonetheless, it is still possible to gain a general understanding of the legal environment in which Bitcoin must be considered [4]. Bitcoins are not issued, endorsed, or regulated by any central bank. Instead, they are created through a computer-generated process known as mining. In addition to being a cryptocurrency unrelated to any government, Bitcoin is a peer-to-peer payment system since it does not exist in a physical form. As such, it offers a convenient way to conduct cross-border transactions with no exchange rate fees. It also allows users to remain anonymous. The United States has taken a generally positive stance toward Bitcoin, Canada like its southern neighbor, the United States, Canada maintains a generally Bitcoin-friendly stance while also ensuring the cryptocurrency is not used for money laundering, Australia considers Bitcoin a currency like any other and allows entities to trade, mine, or buy it. The European Union has not issued any official decision on legality, acceptance, or regulation. In the absence of central guidance, individual EU countries have developed their own Bitcoin stances. the United Kingdom (U.K.) has a pro-Bitcoin stance and wants the regulatory environment to be supportive of the digital currency. Bitcoin is under certain tax regulations in the U.K [7].

In China, the government has prohibited banks and payment institutions from dealing in Bitcoins. The government has further warned that Bitcoin is not a currency and should not be circulated or used as such.²⁶¹ Warning of potential money laundering risks of the Bitcoin system, the Chinese government has further strengthened the oversight of websites involved with Bitcoin [4].

Bitcoin is not regulated in Russia, though its use as payment for goods or services is illegal, Vietnam's government and its state bank maintain that Bitcoin is not a legitimate payment method and the same situation in Bolivia, Columbia, and Ecuador Bitcoin and other cryptocurrencies were banned [7].

3.4. E-commerce and Cryptocurrencies

E-commerce is the recent and upcoming trend of the 21st century. Especially, the last decade has seen a surge in online shopping. Online shopping has made it easy to buy goods and services with the click of a button. There are many companies that sell online products. Consumers can choose from a variety of sellers and even order products from overseas retailers. This has become possible owing to the recent development in technology.

The field of electronic commerce is still an emerging sector and has not reached its climax yet, which is of course a promising sector and a great expansion due to the ease of communication and marketing that the digital revolution enabled. The innovative marketing method stimulated the creation of new payment methods, including digital currencies.

Cryptocurrencies are virtual currencies. Virtual currencies are different from digital money. Digital money refers to the user's funds in the bank account which can be accessed through online mediums. Virtual currencies, on the other

hand, refer to currencies that are mined over the internet. The most notable example of a cryptocurrency is the Bitcoin. Bitcoin is a virtual currency that has value in the virtual world, but it is not physically present. It exists only in the digital world. Savings accounts and banking transactions are subject to government regulations and monitoring. However, this is not the case with virtual currencies.

Despite the recent successes of bitcoin as it has become an acceptable payment mean for many companies, retail stores and food shops, it is still unable to achieve any breakthrough in the largest electronic markets such as Amazon and Alibaba, and the electronic games market is still the most prominent field for Bitcoin and other digital currencies. .

from the viewpoint of E-commerce business, cryptocurrencies seem to be the next logical step for evolution. Cryptocurrencies are operated on a platform called as Blockchain. The blockchain is a highly efficient mode for online data storage. Using blockchain and cryptocurrencies in the e-Commerce sector is highly advantageous. This technology dramatically reduces data storage and data handling costs. The benefits of low-cost transactions can be shared by the business as well as the consumer. This is extremely enticing for online merchants and shoppers alike.

3.5. Challenges and risks

1. Instability of Values

Using cryptocurrencies such as Bitcoin to purchase goods and services carries with it a certain amount of risk. Since its inception, it has gone from zero to nearly \$20,000 for a single Bitcoin in December 2017.

Many new cryptocurrencies are being launched every day. But not all of them are effective in raising funds. Bitcoin has become viral and is probably the face of all cryptocurrencies. It is the highly sought digital currency across the globe. However, it is also an extremely volatile currency quite similar to every other virtual currency. The rate of these currencies keeps fluctuating rapidly. Every action taken by the federal government to control the virtual economy tends to cause huge waves in the crypto exchanges. This is definitely a cause of concern for online merchants who accept Bitcoins or other similar cryptos.

Private creditors and debtors, if given a free choice, will tend to use the currency that is neutral as between them. Debtors would not want to contract in currencies that would appreciate after contracting, and creditors would not want to contract in currencies that would depreciate.[5]

2. Lack of Acceptance

A lack of acceptance is another of the risks you face when you use cryptocurrencies. There are at least a couple of reasons for this.

Some businesses fear cryptocurrencies due to the changes in value it has experienced. This makes them reluctant to accept it a the use scope of s a form of payment. If you try to pay for purchases strictly with cryptocurrency you could end up out of luck with some businesses.

Additionally, cryptocurrencies not classified in many countries as legal currency. This fact alone causes some people and businesses to fear it, mistrust it, and not accept it. It appears that some foreign countries also have a lack of acceptance. Not all of them recognize digital currency as a form of payment either. If you're making a complicated foreign purchase, this fact could make it even messier to

complete. such matter certainly needs to put in place some regulations which may take some time.

3. Theft and technical failures

Bitcoin is known for its high level of technical security as it has not experienced serious technical problems, but like anything electronic it remains vulnerable to attacks and attempts to penetrate the network.

Technical challenges mainly relate to network security, user identity, customer wallet hacking, and theft[7].

Even with encryption to protect cryptocurrency transactions there have been hacks resulting in substantial losses. This is another of the risks of using cryptocurrency.

Passwords can be stolen or hacked. Hardware can be corrupted or taken. Others you do business with could be lax in their security. This could result in losses to your cryptocurrency during a transaction.

There are a number of ways thieves can gain access to your digital currency. As a result, it heightens the risks of using cryptocurrencies.

Clearly, as a new form of currency, it still has some kinks to work through. However, it is possible to minimize some of the risks of using cryptocurrencies if proper precautions are taken.

Maintaining a high level of safety against attacks that are constantly evolving requires a major investment in network security.

4. Money Laundering and Illegal trade

The relative anonymity of Bitcoin transactions, and the speed and ease with which they can be carried out, makes the currency particularly attractive for money laundering and the same features that make bitcoin attractive to money launderers also make it attractive to those who would prefer not to pay taxes and are willing to break the law to avoid doing so. [4]

Criminals use crypto money laundering to hide the illicit origin of funds, using a variety of methods. The most simplified form of bitcoin money laundering leans hard on the fact that transactions made in cryptocurrencies are pseudonymous.

Similar to how an offshore fiat currency bank account can be used to launder dirty money, an online company that accepts bitcoin payments can be created to legitimize income and transform dirty cryptocurrency into clean, legal bitcoin.

bitcoin also appears to be well suited to other illicit activities such as the drug trade, and there are real concerns that Bitcoin may be used to finance terrorist organizations.

CONCLUSION

Digital currencies are a revolutionary technology in processing payments via the network and have experienced significant growth in recent years as a result of the boom of electronic commerce, yet many concerns remain with the use of digital currencies and a number of countries still consider them to be illegal currencies. It is always difficult to predict the future, but technological advancements tend to be put to good use at least until something better comes along. Significant challenges remain for digital currencies, such as price volatility, and this makes them ineffective in processing payments for future contracts and more favorite for a group of speculators rather than the general public. Possibility of using

Bitcoin in illegal activities reinforces governments concerns, which requires developing some laws necessary to regulate the work of digital currencies, which will enhance their legitimacy. However, in my opinion the use scope of digital currencies will increase in the coming years and other forms of government-supported digital currencies may be issued.

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