

# Digital Currency Supervision Based on Blockchain Technology: A literature review

Yi Xing<sup>1,\*</sup>

<sup>1</sup> Hong Kong University, BEcon&Fina

**Abstract:** The 21<sup>st</sup> century has witnessed the revolutionary changes that Bitcoin brought. Notably, the application of digital transactions is not limited to the financial field. Yet the research on its regulation policy seems disproportionately little, and even fewer studies have mentioned the system behind the virtual currency – blockchain technology. Security matters of online transactions have gradually come into people's vision recently. The focuses come down to what blockchain technology is, how it can add to digital currency regulation and the potential of blockchain on refining current regulation policies. This paper helps provide a guideline for virtual currency supervision policy and emphasizes the practical use of blockchain technology. A literature review underpins the study; the research methodology is based on a qualitative perspective. Existing regulatory policies in the USA and UK are assessed to find out their strengths and challenges and examine the use of blockchain technology to alleviate currently implemented policies.

## 1. Introduction

### 1.1 Definition

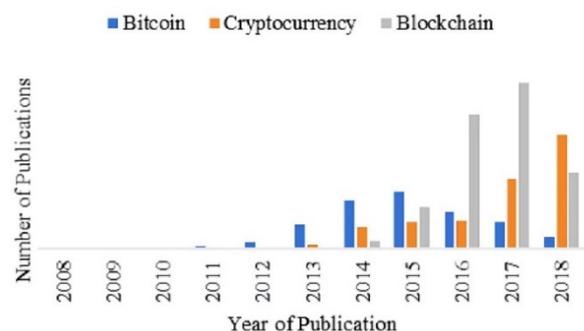
Digital currency, as suggested by its name, is partially anonymous digital money that is not backed by any legal authority and cannot be exchanged formally on the commodity market [1]. Decentralization and transparency of transactions are the two main innovative characteristics of virtual currency. Apart from that, supporters deem virtual currency has a range of unique features, such as high liquidity and low transaction cost, enabling it to become flawless money for daily trading [1]. The system that underpins the prosperity of digital currency is called Blockchain Technology. Essentially, the use of a distributed, replicated, and decentralized ledger retained by everyone for validating and recording transactions is known as blockchain technology [2]. Since all individuals keep their ledger and all copies of the ledger are verified and synchronized through a consensus process, there is no need to rely on central authorities' books. More specifically, third-party involvement in transactions is not needed anymore. Through a peer-to-peer network, the technology makes sending, receiving, and recording related information by traders possible [2]. In that sense, blockchain technology to help with cryptocurrency trading is a practical and effective method as it is the foundation of the whole digital currency system.

### 1.2 Background data

Notably, the use of cryptocurrency started in 2009 after

\*Corresponding author. Email: [yixing0624@gmail.com](mailto:yixing0624@gmail.com)

bitcoin was launched. Bitcoin is the pioneer of all digital currencies, and currently, one bitcoin holds a value of more than \$ 44000. The figure below portrays the increasing prevalence of the use of cryptocurrency since 2008 [1]. (figure 1)



**Figure 1.** The number of publications with cryptocurrency, bitcoin, or blockchain in the title by year.

### 1.3 Importance and Usage of Digital Currencies

It is self-evidence that the importance of cryptocurrency and blockchain technology is being stressed, and applications and transaction volumes that involve them are rapid. Over 1.1 million transactions are being conducted in cryptocurrency Ethereum per day by the end of July 2021, while its Competitor-Bitcoin, had 250,000 daily transactions that month [3]. The usage of blockchain technology is more than virtual currency and financial areas nowadays. For instance, IoT, Energy, Finance, Healthcare, and Government are among the places where blockchain applications have received much attention [4].

Various researchers have researched the issue of digital currency, aiming at deducing its prevalence in the future.

#### 1.4 Existing studies on digital currencies

[5] exhibits a survey on the likelihood of the digital currency overthrowing the fiat money. The study results portray that the next decade will have a major transformation in the financial sector. He exhibits that the digital currency will have recognition in the central bank and will be used in significant transactions. Although his study is based in the united states, it reflects the future of digital currency. More so, most of the significant technological transformations emanated from the united states; hence other countries will be willing to adopt the use of the currencies with the lead of the united states.

Also, [6] documents a study on the importance of digital currencies in transforming lives and enhancing a better financial market. Essentially, fiat money is characterized by significant drawbacks and especially with the issue of inflation. Many nations are facing a major economic crisis as the fiat money is losing value due to inflation. as a result, the standards of living are increasing, making live unaffordably expensive. Auer, R., Cornelli, G., and Frost, J suggests that the most effective way economies can evade this crisis is by adopting digital currencies in their transactions [5]. Essentially, digital currencies have a higher store of value coupled with their high liquidity, which will save economies. It is not subject to inflation as the number of coins released is limited to the blockchain.

#### 1.5 Brief induction of remaining paper structure

In that sense, this paper gives a comprehensive review of the issues of digital currencies through blockchain technology while exhibiting its importance. More so, it gives a case study of the UK vs. the US on the prevalence of digital currencies and how they have been adopted and regulated in these nations.

## 2. REVIEW OF BLOCKCHAIN TECHNOLOGY

Blockchain technology is mainly concerned with electronically storing information in digital form. [7] elucidate that a blockchain is a form of a distributed database shared on the nodes of a computer network. Notably, blockchain has evolved to become a valuable tool in the contemporary world, especially with cryptocurrency's emergence. Generally, blockchain technology has a substantial role in cryptocurrency systems, whereby it enhances the security and decentralization of records in the transactions [7]. [8] expounded that the innovation of blockchain technology guarantees the safety and reliability of data records and plays a significant role in generating trust without necessitating a third party in the transactions.

Notably, blockchain technology allows digital information to be recorded and disseminated to different

users. The technology does not allow editing of the information, a factor that enhances transparency in the process and reliability. In that sense, the technology is founded on transactions that are not subject to change as it does not allow deleting or altering of the information. This factor makes blockchain technology termed distributed ledger technology (DLT).

Although blockchain technology was first invented in the late 20<sup>th</sup> century, it was not valuable as the century had not seen significant technological advancements. However, upon the launching of bitcoin in 2009, the technology came into use as it helped process cryptocurrency transactions [9]. Essentially, the bitcoin protocol is founded on a blockchain that facilitates money transfer between peers without a third party. The most crucial thing in this is that the blockchain that enables the transactions does it transparently while keeping a record of the ledger of payments made by the peers. The blockchain can record any number of data points and transactions.

With the emergence of other cryptocurrencies, many projects seek to implement blockchain technology to facilitate the transaction of this cryptocurrency. [8] exhibits more than 10 thousand projects focused on implementing blockchain technology. These blockchains are aimed at helping society in monitoring their dealings, for instance, in general elections hence enhancing transparency in the processes. For example, a country can implement this by offering every citizen a cryptocurrency token. The candidate will be given a variety of wallet addresses depending on the number of politicians vying for the particular seat. The citizen will be expected to make a payment on the wallet of their chosen candidate. This process will be transparent as blockchain technology does not allow the manipulation of the system by adding or deleting any information. As a result, this will be a transformation in the political arena of many nations as the voting process is faced with many transparency issues. As a result, with the prevalence of cryptocurrencies and blockchain technology, many problems in society that call for transparency and reliability will be improved.

Notably, understanding how blockchain technology works are crucial for enlightening society on this technology. [8] states that the essential thing is that blockchain technology maintains data on monetary transactions through the specific cryptocurrency. Currently, there are many blockchain running the available cryptocurrencies, including Ethereum, dogecoin, tether, Shibainu, and Solana [10]. All these cryptocurrencies have their blockchain that monitors and facilitates the transactions between their peers. One thing to note is that some of the emerging cryptocurrencies have not established blockchain; hence they rely on the blockchain of other cryptocurrencies for transactions. Generally, blockchain technology has been identified as the most transparent and reliable means of storing data regarding monetary and different types of transactions, such as pay-to-public-key-hash, public-key and multi-signature.

Many companies have ventured into this technology to implement organizational goals. For instance, Unilever, AIG, Pfizer, IBM, and Walmart. IBM has adopted the

technology to monitor the transportation of food products to their desired destinations [10]. This helps prevent any contamination cases while avoiding any possible corruption that might be associated with the process. That exhibits that blockchain technology is applicable in various activities, including healthcare, currency, property records, and banking and finance. However, the technology is dominant in the currency industry, especially in cryptocurrency.

### **2.1 Pros and Cons of the Blockchain Technology**

The enthusiast in blockchain technology has engendered presenting the positive and negative impacts of the technology to assess its contribution to the financial markets. [7] elucidate that this technology has a significant contribution in getting rid of the mediators and changing the work rapidly by eliminating third parties' sin transactions. However, that cannot ignore its immense contribution to enhancing transparency and reliability in transactions.

The major pros of the technology are centered around its convenience in enhancing monetary transactions. This technology has portrayed this effectiveness through the transparency and reliability of the process. That helps monitor all the trades involved, which cannot be deleted or added on the blockchain. As a result, the futurists in blockchain technology seek to illuminate how the technology can benefit other sectors apart from monetary transactions.

On the other hand, the technology has several drawbacks that limit its use. [8] exhibit that the blockchain technology is not indestructible hence associated with scalability issues. Generally, this anonymous nature of the technology is not an asset but rather a work overkill. It can significantly result in a high unemployment rate as organizations will scale down their workforce to adopt the technology in executing tasks. This will be a great menace in the future, subject to slow economic development. More so, the technology can result in great complexity, resulting in inefficiency.

As a result, the futurists' in this technology should ensure that it maximally benefits society while ensuring security and transparency in transactions. This will enhance the computerization of transactions while enhancing safety in monetary transactions.

## **3. APPLICATION OF BLOCKCHAIN TECHNOLOGY IN DIGITAL CURRENCY SUPERVISION**

Blockchain technology has significant applications in digital currency supervision and has come to play with the emergence of cryptocurrencies in 2009. The futurists in blockchain technology have documented some of the applications of this technology in digital currency supervision.

### **3.1 Money Transfer**

First, blockchain technology facilitates the money transfer between peers, especially digital currency transactions. [11] exhibit that the sole purpose of the invention of blockchain technology was to enhance the transfer of money between peers without needing a third party in the transactions. The technology was engendered to strengthen transparency and reliability in the transfer of digital currencies. Blockchain technology enhances the use of these transactions as the process is faster and cheaper than the conventional means of many transfers. Currently, many countries led by the US and Canada are adopting blockchain technology to transfer money between peers in a period. This convenience in the transaction is a significant element that is facilitating the prevalence of blockchain technology in money transfers.

### **3.2 Financial Exchange**

Secondly, blockchain technology impacts financial exchanges through a fast and cheap transaction process. Notably, many have emerged recently, focusing on offering decentralized cryptocurrency exchanges. Blockchain technology allows companies to quickly make quicker and more efficient transactions to the users. These companies are enhancing the convenience of their users while making their transactions with their peers. More so, blockchain technology allows monitoring of the transactions without altering the data. That prevents information access by third parties while ensuring that the process is transparent and satisfactory to the users. Most importantly, the decentralized exchanges are not associated with the centralized authority hence protecting the information and assets of the investors [11]. That enhances greater control of the information and records while ensuring that the data is secure enough. Additionally, the blockchain concept applies to traditional investments, improving its validity and dominance in financial exchanges.

### **3.3 Insurance Companies**

Third, blockchain technology is being adopted by insurance companies in enhancing transparency for their consumers. These companies are adopting the technology through cryptocurrency wallets to enable the customers to monitor the transactions and ensure transparency. Notably, the insurance company sector has been associated with many challenges and issues as many consumers complain about the lack of transparency with the agents. That emanates from the lack of transparency of the financial institutions and which can be solved by blockchain technology. Markedly, blockchain technology provides all the information about monetary transactions, which cannot be deleted or added. That will allow the consumers to monitor the dealings with the financial institutions to enhance their satisfaction with the process. More so, the use of blockchain technology allows fast transaction processes, improving the convenience of the process and protecting the consumers' data [11]. That will be a vital

tool for improving the insurance sector and protecting the consumers from manipulation by the companies. Most importantly, the adoption of blockchain technology in insurance will help to digitize the transactions and keep the records of the users, which is a significant element in enhancing the convenience and transparency of insurance companies.

### 3.4 Government Activities

Fourth, blockchain technology is turning into a functional element, especially in voting and maintaining government records in transactions. Notably, contemporary governments are facing many challenges and especially regarding corruption. This is impairing their functionality while slowing down their economic development significantly. As a result, many states are seeking to develop strategies that will enhance transparency in the government processes while ensuring the reliability of the government to the citizens. The most crucial process calling for transparency is the use of government funds and the election processes. However, no solid strategies are developed for documenting government transactions through blockchain technology. That emanates from the fact that the centralized states do not recognize the decentralized cryptocurrencies; hence, blockchain technology cannot be applied to monitoring government transactions. However, the futurists in blockchain technology predict the possibility of the government adopting the technology in recording and keeping track of the transactions [12]. Nonetheless, blockchain technology has been advocated for enhancing the transparency of elections. This technology can be used to improve free and fair elections as many nations are facing the issue of dishonesty with the electoral boards. That will be achieved by giving every citizen a cryptocurrency token used as a voting card. In that sense, the citizens will be expected to deposit the cryptocurrency into a wallet depending on their chosen politician, whereby every politician will be allocated a cryptocurrency wallet to monitor their votes [11]. This process will be free and fair at blockchain technology does not support altering the information; hence the individuals who alter the election information will not have a chance. This will enhance honesty and transparency in the election process while significantly transforming the political arena.

### 3.5 Store of Wealth

Lastly, blockchain technology is slowly growing into a form of exchange whereby investors use cryptocurrencies to exchange wealth and store their money. Notably, this is an emerging thing that resulted from the launching of cryptocurrencies. That emanates from the fact that these cryptocurrencies support the transaction of money from peer to peer without the necessity of a third party. This element is vital in the exchange process as it has significantly enhanced the convenience and ease of transactions. Generally, most investors choose to store their wealth in the cryptocurrencies, especially in the stable coins such as the tether and finance, as they do not

lose value compared to fiat money [11]. Through this, they can have a long-term value for their money without the centralized authority regulations. More so, they can choose to transact the money to peers across the globe through the blockchain in a trustworthy process. That gives them value for their money and transparency. This element has enhanced the dominance of blockchain technology in the contemporary world. That emanates from the fact that it supports many transactions while keeping complete records, unlike fiat money. Essentially, fiat money is highly subject to alteration by the authority and third parties, which affects the transparency involved in the process [12]. In that sense, the emergence of blockchain technology has been instrumental in enabling investors to have a new store of safe and transparent wealth, unlike the conventional ways of storing wealth.

## 4. A CASE STUDY OF THE US VS. THE UK IN THE USE OF THE DIGITAL CURRENCIES THROUGH THE BLOCKCHAIN TECHNOLOGY

While the UK and the US are in the lead in developmental changes, the adoption of digital currency has been seen in these countries. [13] evaluate the current situation of the profitability of cryptocurrency in these two countries. He exhibits that the two countries are leading in cryptocurrency adoption, with an average adoption rate of 7.2% as of 2020. The awareness of cryptocurrency started increasing in these countries in 2018, whereby many people were getting to learn about the advantages associated with the use of digital currencies. [14] exhibits that the United States currently have an adoption rate of 8.3%, whereby 27473000 individuals own bitcoin. That portrays that the data does not include the owners of other digital currencies.

In that sense, the United States are the leading country in the adoption of digital currency. Most importantly, the digital currencies are owned by 61% of the British residents in the government-owned the digital currency. They have been accepted in the United States, whereby peers are currently making transactions using digital currencies, especially bitcoin. The use of the currency for marketing has been enhanced by its nature and the transparency associated with the process. That emanates from the fact that an individual can easily monitor the transaction process.

A study conducted in the United States by [14] in 2018 revealed that 61% of the British in the US-owned digital currencies. The number raised in 2019, whereby 71% of the British in the US owned the different types of cryptocurrency. That portrayed that the Britons in the US are the significant contributors to the growth of the digital currency in the country.

When the cryptocurrency owner has broken down regarding the owners' ownership levels and income, the results are fascinating. The study proves that over 70% of the digital currency owners in the US have an average annual income of over one million dollars and 33% of the owners have an average income of five hundred thousand

dollars.

More so, the study tried to develop a perspective on the age of the owners whereby it deduced that most of the digital currency owners in the US are aged 18 years to 44 years. This is 58% of the digital currency owners, while the other percentage is 55 years and above. That concludes that the digital currency owners in the united states are the youth, the wealthy Americans, and the tech-savvy individuals.

The study also considered the education level of the digital currency owners across the united states, which revealed that 17% of the owners have a doctorate or equivalent education level. On the other hand, 9% of the holders qualified with secondary education level. Additionally, 16% of the owners were men, while 7% were women. The results exhibit that the digital currency and blockchain technology call for a high education level for understanding as most of the individuals who have adopted the currency are educated. More so, men tend to be in the lead in investing in digital currencies compared to women.

The study concluded by deducing the purpose of the ownership of the digital currency among the winners in the US. The results portrayed that 46% of Americans who own cryptocurrency are using it to make transactions and purchases, while the rest are using the digital currency arena for investment purposes. That exhibits that the significant role of digital currencies is to store wealth and facilitate purchases and exchange.

On the other hand, the study performed a study in the United Kingdom to determine the prevalence of the use of digital currency. According to the survey, 3.3 million individuals across the United Kingdom own digital currency. The number is relatively low compared to the united states. The study also indicated that as of 2018, 61% of Britons in the UK owned digital currency, whereby the percentage rose to 10% as of 2019.

Breaking down the ownership according to the income and ownership levels, the study indicated that 40% of the digital currency owners earned over two hundred thousand euros annually. Also, 18% of the owners earned above one hundred thousand euros annually, indicating that the ownership is mainly among wealthy individuals.

According to the age classification, the study revealed that the majority of the owners with a percentage of 33% are aged 18-34 years old, while 4% are aged 55 years old and above. Also, the highly educated Britons with a percentage of 21%, hold digital currencies. While 7% of digital currency holders achieve secondary education level. Out of the educated population, 10% are male while 6% are female exhibiting that majority of the educated men have ventured into the investment and use of digital currencies. The study concludes by exhibiting that 42% of the Britons use the cryptocurrency for purchases while the rest uses the digital currency as a form of investment.

From the study, the United States are more prevalent in the use and investment of the cryptocurrency. More so, the US has balanced the use of digital currency whereby an almost equal number of individuals use the currencies for purchases while the rest for investment, unlike the UK. However, both countries demonstrate a fast adoption of

the cryptocurrency, and they exhibit a high potential in the use of digital currency in the future.

## 5. CONCLUSION

In conclusion, the digital currency adoption and blockchain technology is a prevalent issue in the contemporary world. Notably, this has emanated from the development of new technologies which enhanced the development of new forms of storing wealth. Notably, the blockchain technology can be traced back in 2009 since the emergence of the bitcoin. Bitcoin was the first digital currency to be invented, and currently it is having a great value than other emerging digital currencies. Essentially, the bitcoin is having a great value of more than 40 thousand dollars exhibits that it has a great potential in overpowering the fiat money. Generally, the use of digital currencies is more advantageous than the fiat money as they are not subject to inflation. This inflation is affecting many nations at the moment and a slow economic development of the globe is expected. However, with the digital currencies, they are limited in amount hence their value will keep increasing from the demand. More so, they are monitored through the blockchain technology which does not allow for deleting or altering of the stored information. This technology is efficient in enhancing the transparency and reliability of transactions which is lacking in the fiat money transactions. As a result, the blockchain technology presents a great potential in changing the financial markets and enhancing convenience and efficiency in transactions. As a result, the blockchain technology is growing rapidly and currently many sectors are adopting it in enhancing fast and cheaper transactions. Also, this technology is advantageous to organizations in enhancing a true track of their monetary records. Although the technology can result in scaling down of the employees, it presents significant advantages that cannot be objected. The application of the blockchain technology is used and not limited to insurance companies, voting, monetary transactions, and financial exchanges. The study has also exhibited a case study between the UK and the US in terms of their adoption of the blockchain technology and digital currencies. The study proves that the United States is at the lead in the adoption of the digital currencies and blockchain technology. Also, the UK is at a good place in this and both countries will see significant growth in the use of the digital currency and blockchain technology in the near future. Generally, the use of digital currencies and blockchain technology has significant advantages on economies and advocacy should be created for the adoption of this technology.

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