

Review on Digital Currency

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ABSTRACT

Nowadays, more and more banks and other financial service companies are promoting digital currency transfers and other online transactions, which are wire transfers or transfers between parties over long distances. Digital currency contributes to the globalization of the global economy because it is easier to trade by sending and receiving digital currency. [1] The Technology underlying Money continues to evolve, and many scholars and experts are concerned about the development of the digital currency. Through the research of domestic and foreign digital currency literature and related information, this article summarizes the concept, classification, characteristics and benefits, risks and potential problems of digital currency, and finally gives an overview of the development trend of digital currency. In a broad sense, digital currency is any form of money or payment that exists only in spreadsheets. And digital currency could be classified as cryptocurrency, virtual currency and central bank digital currency(CBDC). They are usually decentralized and anonymous. The features enhance the security of users. Digital currencies offer enhanced security, greater convenience and compatibility, making up for the drawbacks of cash. Market risks, security risks, law risks, bank risks and risks for producers are the main risks that digital currency brings. According to much research, CBDCs which can maximum to limit the risks of digital currency might be the main trends of digital currency's future.

Keywords: digital currency, cryptocurrencies, CBDCs, decentralization, regulation

1. INTRODUCTION

There are subtle differences between digital currencies and cryptocurrencies, although the two terms are often used interchangeably. Cryptocurrency is a subset of digital currency, but it uses cryptography to ensure security, so this makes counterfeiting extremely difficult [24].The 2008 global financial crisis accelerated the inevitable evolution of currencies into cryptocurrencies. Blockchain, distributed ledger and decentralization are innovations of this currency revolution. The emergence of cryptocurrency has made up for the shortcomings of the original real currency, while also bringing other benefits and potential risks. However, many countries can only take wait-and-see or even ban measures because of the risks brought by its characteristics. What will be the future of digital currency has become a concern of many economists and national governments. This paper summarizes the current situation, classification, characteristics and possible benefits and risks of digital currency published by previous scholars, and puts forward suggestions on supervision. And the future development direction of digital currency is predicted.

2. DEVELOPMENT AND CURRENT SITUATION

After the price of bitcoin exceeded \$10000, digital currencies are receiving increasing traction every day. According to the white paper of bitcoin, bitcoin is a purely peer-to-peer version of electronic cash that will allow online payments to be sent directly from one party to the other without going through a third-party intermediary. The appearance of bitcoin is revolutionary for commercial currency. Several representative digital currencies after bitcoin include Libra, DCEP, etc. Libra is another type of digital currency and cryptocurrency which is created by Facebook.[1]

While there are many concerned that bitcoin's price is over-hyped, the blockchain --- the technology behind digital currency, is used by many countries to try to create their digital currencies, such as Sweden, Tunisia, Ecuador, Japan and Russia, etc. And DCEP is a particular digital currency and cryptocurrency created by the Chinese central bank with Blockchain and Cryptographic technology.[2]

As of August 14, 2020, the Ministry of Commerce has officially issued the "Comprehensive Deepening of Service Trade Innovation and Development Pilot Program" to carry out DCEP pilot projects in the Beijing-Tianjin-Hebei, Yangtze River Delta, Guangdong-Hong Kong-Macao Greater Bay Area, and the pilot areas in the central and western regions where conditions permit. However, although China promotes their own CBDCs, DCEP, China banned all cryptocurrencies and virtual currencies trading and speculation. All business activities related to cryptocurrency are illegal financial activities and firmly forbid.[22] In addition to China's official national-level digital currency issuance, international regulatory attitudes towards digital currencies are mainly divided into three categories. The first is the appropriate type of regulation, such as the United States. Several state governments have proposed and passed laws affecting cryptocurrency and blockchain technology, and most of these activities take place in the legislative branch. There are generally two methods of supervision at the state level. Some states try to promote the technology through very favorable regulations so that cryptocurrencies are not subject to state securities laws and/or currency transmission regulations. These countries hope to use investment in technology to stimulate the local economy and improve public services.[19] The second is the type of active support, such as Thailand. In 2018, Thailand issued the "digital asset law", but it was revised in 2021. As of February 15, 2021, the Ministry of Finance has issued 14 licenses to 11 operators. The Office of the US Securities and Exchange Commission announced a list of 7 cryptocurrencies that are allowed to be used for ICO investment and trading as well as basic trading pairs. They are Bitcoin, Bitcoin Cash, Ethereum, Ethereum Classic, Litecoin, Ripple and Stellar.[20]The third type is completely prohibited, such as in Bangladesh and Nepal. The countries ban all cryptocurrencies.[21]

3. CLASSIFICATION OF DIGITAL CURRENCY

Usually, digital currencies are divided into three categories:

3.1. Cryptocurrency

Cryptocurrency is a digital currency that uses encryption technology to protect and verify online transactions. Cryptography is also used to manage and control the creation of such currencies. Bitcoin is one

example of cryptocurrency. Depending on the jurisdiction, cryptocurrencies might or might not be regulated.[6]

3.2. Virtual Currency

Virtual currency is an unregulated digital currency that is controlled by a developing agent or a founding organization made up of various stakeholders involved in the process. Virtual currency can also be algorithmically controlled through defined network protocols. An example of virtual currency is gaming network tokens, the economics of which are defined and controlled by developers. [6]

3.3. Central Bank Digital Currency(CBDC)

The Bank of England describes CBDC as an electronic CB currency(where CB is the central bank):

(i) Can be accessed more widely than reserves,

(ii) The potential function of retail transactions is much greater than cash,

(iii) Having a different operating structure from other forms of central bank currency, making it possible to serve different core purposes, and

(iv) It can be interest-bearing. Under realistic assumptions, the interest rate paid is different from the reserve interest rate.[7] And, Digital Currency Electronic Payment(DCEP), the digital currency created by China is one example of CBDC.

4. FEATURES OF DIGITAL CURRENCY

It is undeniable that there are similarities and differences among the three different digital currencies of cryptocurrency, virtual currency and CBDC, but they all have the following characteristics of digital currencies.

4.1. Decentralization

So far, although there is no complete consensus on the characteristics of digital currencies, most currencies and economists believe that 'decentralization' is one of its most important and obvious characteristics. In Satoshi Nakamoto's perspective, the concept behind Bitcoin, is a decentralized consensus, with no need for a central intermediary.[3]

The decentralized commerce can usually be defined as the exchange of financial instruments, goods and

services on a global scale through emerging decentralized technologies. Starting from various experiments of electronic cash, such as DigiCash, including the emergence of the Bitcoin protocol in 2009, the digital asset market is a market for virtual asset investment opportunities. [4] Whether it is bitcoin, libra or DCEP, these digital currencies and cryptocurrencies all have the characteristics of decentralization.

4.2. Anonymity

Another feature is anonymity. Distributed ledger technology(DLT) which is the basis of digital currencies is designed either on an anonymous basis. To restrict the number of money users can spend on AML/CTF without viewing transaction data by the AML authority, a new concept-"anonymous credentials" was designed. The AML authority periodically sends out these additional, time-limited statuses to each central bank digital currency(CBDC) user. If users want to transfer CBDC without disclosing information to the AML authority, they need to spend these vouchers to transfer in. Therefore, the number of CBDCs that can be used anonymously is limited by the number of vouchers provided to each user by the AML agency. Although technically speaking, vouchers are "spent", they are just a technical tool used to limit the amount of CBDC that can be transferred anonymously.[5]

5. BENEFITS OF DIGITAL CURRENCY

Decentralization brings benefits to digital currency compared to real money. For example, Coming from computer science rather than economics or business, the core innovation is to use encrypted certificates instead of trusted third parties to verify the integrity of transaction information in a decentralized computer network. Bitcoin does not eliminate trust. It can be said that it provides automation of trust through blockchain and distributed ledger technology (DLT). In short, algorithms record transactions in blocks and add them to the existing blockchain through cryptographic signatures. This "blockchain" represents a transaction ledger in which a hash function maps keys of variable size to values of fixed size. In a "distributed" ledger, new blocks must be verified by all participants or groups of permitted participants ("nodes") that synchronize and maintain the entire transaction history. Generate multiple copies of the same ledger, thereby enhancing the security of the system.[8] Anonymity means that restrictions on anonymous CBDC

transmissions can be enforced without recording the amount of CBDC spent by users, thereby protecting users' privacy[5], security, which is the advantage of the anonymity of digital currency. Additionally, digital currency, DCEP as the example, compared to traditional cash is more convenient. The DCEP can be paid through a payment institution or not through a payment institution, bank account circulation. Furthermore, the good compatibility of the CBDC allows it to be used in many scenarios, regardless of the system and network used in the scenario. Generally speaking, in the scenarios where cash, electronic money and bank deposits can be paid, CBDC can also make payments. Also, the CBDC can make up for the shortcomings of cash. The research also proves that cash has the following drawbacks due to its characteristics: a. the cost of issuance, storage and processing of cash is relatively high; b. cash is often used for illegal economic activities due to its complete anonymity; c. cash will make it impossible to implement a negative interest rate monetary policy. If the CBDC is implemented, then it will well solve the above-mentioned shortcoming of cash. The issuance of the CBDC is based on system generation, which will greatly reduce the cost of issuance and storage. In addition, due to the controllable anonymity of the CBDC, relevant illegal and criminal activities can be well traced through the system's records when illegal economic behavior occurs.[9]

6. RISKS OF DIGITAL CURRENCY

However, due to the decentralization of digital currency, anonymity and price instability have led to many side effects and risks. It is not difficult to find the following risks which lead to digital currency has not been fully popular after being integrated Agustin Carstens(2021), Pasuthip, P., & Yang, S. (2020), and Cristian deRitis(2021).

6.1. Market Risks

The digital currency price is unstable. In practice, bitcoin is more like a speculative asset rather than money. Bitcoin seems very charming but lacks real value. The Bitcoin network might be considered as an online gamers community that uses real money exchange items that only exist in network zones. Bitcoin calls itself a unit of account. In fact, the decentralization makes the value of Bitcoin fluctuate means that it is not realistic to set a stable price for Bitcoin. This also weakens its usefulness as a means of

exchange and makes it have a poor ability to store value.[2] The price manipulation: The Bitcoin market's structure is decidedly concentrated and non-transparent, and it has been proved that price manipulation exists in the Bitcoin market. [3] Besides, the features make the price of digital currency is unstable and not easy for consumers to accept digital currency.

6.2. Security Risks

Digital currency is still the choice of black market trading medium to this day; digital currencies are easily chosen by criminal organizations and terrorist groups to process funds.[11] Therefore, the concealment of digital currency has brought hidden dangers to the security of economic property and social stability.

Law risks: It is not easy for law enforcement to target one particular central entity or location to investigate or seize assets[11]; blockchains afford money is kept outside of banks which makes law enforcement is not promoted. The beneficiaries may be anonymous, the transaction flow may be confused, and income may be hidden for tax purposes.[13]

Bank risks: some people are concerned that increasing CBDC sorts of digital currency will raise the risk of structural disintermediation of banks for the global banking system and the risk of promoting a systemic run on the bank in a critical situation.[10]

Risks for producers: As depositors seek safer alternatives, they face the risk of a run during times of stress[12];

From the above content, it can be seen that the decentralization, anonymity and other characteristics of digital currency, as well as it is not a fully mature technology, have caused it to have greater risks in the market, legislation, and supervision.

7. REGULATIONS & SUGGESTIONS

There are mainly 5 risk management measurements in the risks of digital currencies.

7.1. Regulatory Approval

The most important inherent risk mitigation associated with cryptocurrencies is regulatory approval. Some regulatory approvals, if obtained, could enhance and imply acceptance and credibility in the cryptocurrency community. To do this, the best place to start must be the reserve currency, the U.S. dollar, but

be aware that not all managers are equal and cryptocurrencies in different countries often have multiple diverse and differing regulatory frameworks. The best outcome would be regulatory confirmation from all agencies, but given the vested interests of each regulator, approval from at least two should be enough to increase credibility and trust.[23]

7.2. Foreign Exchange Reserve Requirements

Enhancements to the ecosystem could include more robust cryptocurrency exchanges, organizations that help interesting individuals trade in the traditional sense. Cryptocurrency exchanges that not only act as an exchange but also act as brokers and custodians. If these exchanges hold a certain amount of reserves to weather any major downturn or crash, using the same principles as clearinghouses, this would add an additional layer of protection during periods of volatility and market uncertainty.[23]

7.3. Risk Management Framework

The significance of risk documentation cannot be overstated because there is a consensus among ecosystems involved in risk management guidelines, standards, and procedures that align themselves with good industry best practices. A standard risk management framework will cover standards and procedures for cyber, fraud, business credit, entity secure assets, IT security and data, third-party vendors, and anti-money laundering, which will require business continuity and disaster recovery plan. Because all of these risks are highly correlated, the framework needs to be a broad enterprise. To be effective and actionable, the risk framework needs to be complemented by a great deal of content through real-time information gathering and scenario planning. Given the great dependence on technological change and development, software upgrades need special mention and attention. More importantly, each participant in the ecosystem chain should take risks, assess the adequacy and effectiveness of the implementation of its documentation, in order to aid confidence and reduce risks. The application of common standards such as CCSS(Cryptocurrency Security Standard) introduced in 2014 should be supported by all. (This standard is currently the standard for any information system that handles and manages crypto wallets as part of its business.[23])

7.4. Education

Those overseeing mergers and acquisitions need to understand the legal and operational risks of cryptocurrency and blockchain. In order to provide adequate protection in the statement and warranties documents of the transaction[23].

7.5. Law-created

Digital currency transactions are governed by common law, including contract law, but are also governed by the principles of negligence, agency, and fairness, such as fiduciary relationships. Regulatory actions vary around the world, from making digital currencies unregulated to taking some actions in taxation, anti-money laundering and counter-terrorism financing, to complete bans. For example, the People's Bank of China has banned fundraising through digital currency issuance,[14] South Korean authorities have also done so. [15] The European Securities and Markets Authority and the US Securities and Exchange Commission have reminded investors of the high risks of ICOs. [16] The ban will inevitably put downward pressure on prices. In the middle area, there are already some regulatory warnings about risks. Some securities regulators have stated that although digital currencies provide new opportunities for companies to raise funds and investors to gain wider investment. At the same time, they can rise protection concerns of investors.[17] The characteristics of digital currency and the risks it brings make it necessary to supervise digital currency.

8. FUTURE AND DEVELOPMENT

In fact, it is hard to make an accurate prediction about the future of digital currency development. In Tony Richards' opinion, some form of intermediaries will still be a vitally important role, even the world finance is more decentralization than the current situation[18]. And there are two aspects of the choice of payment instrument which will be used to settle the transactions. The first is that entities and individuals are likely to want to pay and receive financial assets with a high degree of value stability. Very few parties to transactions, especially high-value parties, hope to settle by paying in a cryptocurrency with high volatility. Fiat currencies, such as CBDCs or very safe stable coins that are issued by regulatory entities, will be widely used in tokenized asset transactions. In the second, he anticipates that entities that conduct transactions on the blockchain will want to ensure that they can conduct

transactions in a clear and final settlement. He also envisioned a future where the establishment of a strong regulatory framework for stable coins may lead to the issuance of stable coins by highly rated entities.[18] There is a high percentage probability which the increasing Central banks may switch to issuing CBDCs.

9. CONCLUSION

This paper summarizes a large number of pieces of literature and finds that the development of digital currency and blockchain technology can make up for cash drawbacks, realize automation, improve compatibility and reduce release costs. Due to its imperfect technology, market risks, security risks, law risks, banks risks and risks for producers, governments around the world are adopting different ways to strengthen regulation of cryptocurrency represented by bitcoin. Regulatory approaches include regulatory approval, foreign exchange reserve requirements, risk management framework, education and strengthening legal supervision. At the same time, countries plan or attempt to issue national digital currencies (CBDCs) issued by central banks, centering on decentralization. The launch of CBDC seems to be the main development trend of digital currency in the future.

REFERENCES

- [1] Digital Money - Overview, How It Works, Examples, Risks (corporatefinanceinstitute.com), <https://corporatefinanceinstitute.com/resources/knowledge/other/digital-money/>
- [2] (2021), China's National Digital Currency DCEP / CBDC Overview, <https://boxmining.com/dcep/>
- [3] Remarks by Agustín Carstens(2021). Digital currencies and the future of the monetary system. Hoover Institution policy seminar,1-17.
- [4] Kaal, W. A. (n.d.). Past, Present, and Future.
- [5] IN FOCUS|Issue no 4| December Exploring anonymity in central bank digital currencies
- [6] Jake Frankenfield (2021) Digital Currency for <https://www.investopedia.com/terms/d/digital-currency.asp>
- [7] Kumhof, M., Noone, C., 2018. Central Bank Digital Currencies - Design Principles and Balance Sheet Implications. SSRN Electronic Journal.

- <https://doi.org/10.2139/ssrn.3180713> (accessed 2.6.19).
- [8] Peneder, M. (2021). Digitization and the evolution of money as a social technology of account. *Journal of Evolutionary Economics*. <https://doi.org/10.1007/s00191-021-00729-4>
- [9] Zhao, Z. X., & Liu, H. (2021). Digital currency, trade settlement innovation and improvement of international monetary System. *Review of Economics and Management*, 3, 44 -- 57.
- [10] Pasuthip, P., & Yang, S. (n.d.). Central Bank Digital Currency: Promises and Risks.
- [11] Cryptocurrency as a Payment Method, 2017, Public-private Analytic Exchange Program
- [12] Cristian deRitis, C.d.(2021), Digital Currencies: Risks and Opportunities, <https://www.garp.org/risk-intelligence/technology/digital-currencies-risks-and-opportunities>
- [13] Courtois, N., Gradon, K., & Schmeh, K. (2021). Crypto Currency Regulation and Law Enforcement Perspectives. ArXiv.
- [14] The People's Bank of China, Public Notice of the PBC, CAC, MIIT, SAIC, CBRC, CSRC and CIRC on Preventing Risks of Fundraising through Coin Offering (8 September 2017) <<http://www.pbc.gov.cn/english/130721/3377816/index.html>>.
- [15] See, eg, Cynthia Kim, 'South Korea Bans Raising Money Through Initial Coin Offerings', Reuters (online), 29 September 2017 <<https://www.reuters.com/article/us-southkorea-bitcoin/south-koreabans-all-forms-of-initial-coin-offerings-idUSKCN1C408N>>.
- [16] See, eg, US Securities and Exchange Commission, Investor Bulletin: Initial Coin Offerings (25 July 2017) [Investor.gov](https://www.investor.gov) <<https://www.investor.gov/additional-resources/news-alerts/alerts-bulletins/investor-bulletin-initial-coin-offerings>>; European Securities and Markets Authority, ESMA Alerts Investors to the High Risks of Initial Coin Offerings (ICOs) (13 November 2017) <https://www.esma.europa.eu/sites/default/files/library/esma50-157-829_ico_statement_investors.pdf>.
- [17] Latimer, P., & Duffy, M. (2019). Deconstructing Digital Currency and Its Risks: Why ASIC Must Rise to the Regulatory Challenge. *Federal Law Review*, 47(1), 121–150. <https://doi.org/10.1177/0067205x18816237>
- [18] Richards, T. (n.d.).(2021) The future of payments:Cryptocurrencies, Stablecoins or Central Bank Digital Currencies.
- [19] Joe Dewey(2021), Blockchain& Cryptocurrency Laws and Regulations 2022|USA.<https://www.globallegalinsights.com/practice-areas/blockchain-laws-and-regulations/usa>
- [20] Kowit Somwaiya, Naddaporn Suwanvajukkasikij, Tong Wang and Thatchaya Bunnithithanakit(2021), Digital asset law of Thailand after Three Years. <https://www.lexology.com/library/detail.aspx?g=09e85b28-70a6-4fe4-8032-d7c573dd553c>
- [21] (2021)List of countries where Bitcoin is banned or legal in 2021, <https://portalcripto.com.br/zh-CN/2021%E5%B9%B4%E6%AF%94%E7%89%B9%E5%B8%81%E8%A2%AB%E7%A6%81%E6%AD%A2%E6%88%96%E5%90%88%E6%B3%95%E7%9A%84%E5%9B%BD%E5%AE%B6%E5%90%8D%E5%8D%95/>
- [22] (2019),China regulators to ban crypto trading and speculation.<https://www.pinsentmasons.com/out-law/news/china-regulators-to-ban-crypto-trading-and-speculation>
- [23] John Thackeray(2018), 6 Risk Management Methods to Reduce the Inherent Risk of Cryptocurrency, <https://daily.financialexecutives.org/FEI-Daily/July-2018/6-Risk-Management-Methods-to-Reduce-the-Inherent-R.aspx>
- [24] Gilpin, L. (2014) 10 things you should know about Bitcoin and digital currencies. TechRepublic. Retrieved 6/28/2014 from <http://www.techrepublic.com/article/10-things-you-should-know-about-bitcoin-and-digitalcurrencies/>