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Based on the Impact and Challenges of the Digital Currency Issued by the Central Bank

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Abstract: With the development of information technology and the continuous innovation of fintech, digital currency has been well-known by more and more people. From the advent of Bitcoin to the launch of Libra by Facebook to China's voice on the central bank's digital currency DC / EP research, let us realize that the era of digital currency is coming. The main object of this paper is the issuance of digital currency by the central bank, namely legal digital currency. Since the emergence of private digital currency, many problems have been exposed, and the scope of circulation and use in the international market is also very limited, but at the same time, it has also sounded the alarm for various countries. The issuance of legal digital currency is considered to be a good development direction and an effective way to deal with the rapid development of digital currency. In terms of content, this paper first divides digital currencies into two categories: private digital currencies and legal digital currencies to compare, and analyzes and discusses them in terms of their issuance mode and quantity, main use and operation mode. Next, it discusses the risks of private digital currency from four aspects of value, security, supervision and currency, which confirms the importance of the central bank issuing legal digital currency from the side. Then the advantages of legal digital currency are analyzed, especially for China, the issuance of digital currency by the central bank can also help the process of RMB internationalization. Next, this paper focuses on the four challenges that the central bank will face in the new form of digital currency, which are the challenges to science and technology, the challenges to legal norms, the challenges to circulation and use, and the challenges to policy regulation. Finally, the future development of the digital currency is discussed, which will change our daily payment methods and make our life more convenient.

Keywords: Digital Currency; The Central Bank; Legal; Internationalization; Payment

1. Introduction

1.1 Research background

In recent years, with the proposal and development of blockchain technology, the vigorous promotion of Internet innovation and the rapid rise of the electronic payment industry, people's lifestyle has been improved a lot. In terms of daily payment, both the commonly used "wechat" and "Alipay" commonly used in China and the commonly used credit cards abroad belong to electronic currency, which is actually the electronization of cash issued by the central bank. Digital currency is a form of virtual currency based on blockchain technology and the application of digital encryption algorithm. It has the same role as the currency we currently use, can be used as a means of payment, can be stored and traded, etc. Because of its technological innovation, it has the characteristics of anonymity and decentralization, and can effectively reduce the time and labor cost of transactions, and has a good application and development prospect.

1.2 Development status, both at home and abroad

Speaking of digital currency, the first time it has attracted people's attention should be the birth and development of Bitcoin. Since its launch in 2009, bitcoin has fluctuated from less than a cent to $10,000, and reached its all-time high of $19,850 on December 17,2017. Bitcoin has attracted wide attention in the financial community since its birth. It is a virtual cryptocurrency based on peer-to-peer form. It uses distributed databases to store all transaction information. Decentralization is its prominent feature, while ensuring the security of circulation and the anonymity of transactions through the design of cryptography. After ten years of development, its value has gradually stabilized. On the one hand, Bitcoin has been gradually accepted and recognized by other countries and related fields; on the other hand, the relevant industry chain and market mechanism of Bitcoin are becoming more and more perfect. After the emergence of Bitcoin, there have been many other

digital currencies, such as Litecoin and XRP, etc.

Until 2019, Facebook launched the digital currency Libra, which once again attracted the attention of the business community and the market. Unlike previous bitcoin, which are based on public communities, this is the first time money is issued by a private company. This is thanks to its huge global Internet user base, and by the end of 2018, Facebook had about 2.3 billion monthly active users, and even China, the world's most populous country, is far from that figure. Libra It plans to maintain the stability of its currency value by pegging it to five sovereign currencies, the US dollar, euro, yen, pound and Singapore dollar, and is a stablecoin with asset collateral[1].Libra While attracting partners to join, it was also questioned by the outside world, believing that there are many problems in regulatory governance and significant risks in money laundering and other aspects.

Both the previous Bitcoin and Libra are privately issued digital currencies, and with the further attention to and research of digital currencies in various countries, the possibility of central banks to issue legal digital currencies has aroused more and more discussion. At the Bund Financial Summit at the end of October 2019, the Chinese official research on the central bank's issuance of legal digital currency DC / EP spoke out again, which made us realize that legal digital currency is getting closer to us[2]. In addition to China, countries all over the world are vigorously promoting the research of legal digital currency, hoping to occupy a place in the international money market on the basis of stabilizing the value of their own currency.For example, the UK has proposed the digital currency model framework RSCoin, and Japan, Canada, Russia and other countries have also announced plans to study and launch the official legal digital currency. In the future, with the further research of legal digital currency and the gradual practice of technology application, it will certainly have a significant impact and change on the money market system.

1.3 The research content of this paper

This paper mainly includes five parts: the first section of the introduction mainly introduces the background of digital currency and the current development status at home and abroad; The second section is mainly the comparative analysis of the emerging and proposed private digital currency and legal digital currency; The third section is to explore the importance of issuing legal digital currency through the risk analysis of private digital currency and the advantages and influence of legal digital currency; The fourth section is to analyze some challenges that the central bank will face in issuing digital currency; The fifth section mainly includes suggestions on coping with challenges and prospects for the future development of the central bank's digital currency.

2. Comparative analysis of different types of digital currencies

2.1 Private digital currency

For private digital currencies, a type of digital currency, led by Bitcoin, is not issued by a special central institution, and is not directly linked to the current currencies of various countries, so there is no actual asset mortgage. It uses a P 2P peer-to-peer network to manage the circulating currency, and theoretically everyone in the network has the right to issue the corresponding digital currency. However, because of the particularity of its algorithm setting, its monetary amount is certain. Bitcoin is currently not being effectively regulated in any country or region, and there are certain risks. Although Bitcoin, as a currency, has certain payment functions, many people regard it as an investment product because of its unstable value compared with legal sovereign currencies and similar characteristics of stock and bonds.

In 2019, the digital currency Libra launched by Facebook was issued by private enterprises and achieved relatively stable currency value by linking it to various existing sovereign currencies. It is a stablecoin with asset collateral and is relatively easy to accept regulation. According to the white paper released by it, digital currency Libra by the Libra Association as the highest management organization, and jointly complete the operation and maintenance of the entire ecological trading system of digital currency Libra. It is based on the Facebook social platform for a large number of users, mainly aiming for payments and transnational transactions. But many countries in the world to issue Libra currency resistance, because it will have a certain impact on its own currency, especially for those sovereign currency relatively fragile countries, if its currency is obvious devaluation, domestic holdings of the masses will be greatly reduced, once the Libra can realize

convertibility, then the money market and policy will be destroyed, the central bank is likely to lose control of the money market. Therefore, the study of legal digital currency is also increasingly important[3].

2.2 Legal digital currency

In terms of legal digital currency, many countries around the world are pushing for research. Take DC / EP proposed by our central bank as an example, its main purpose is to replace M0, that is, cash in circulation. It can achieve transactions and value transfer without an account, without a network, and its properties and functions are the same as the cash we use now, but in a digital form. DC / EP, like cash, does not generate interest and is mainly used to pay for small transactions in daily life. The central bank of digital currency plan adopts double operating system, namely by the central bank put the DC / EP to various commercial Banks or commercial institutions, then by them to exchange to the people, at the same time, participate in the exchange of commercial institutions also need to pay 100% of the full reserve, so the legal digital currency are actually for the central bank's liabilities. China's central bank should still adhere to the centralized mode for the management of digital currency, so as to strengthen its regulation of digital currency and its macro-prudential function.

3. Discussion on the necessity of central banks to issue digital currency

3.1 Risks of private digital currency

3.1.1 Deflation and value risk

Private digital currency, such as COINS, Ethereic, due to the characteristics of its issuing way (that is, find the process of solution) determines it on the total number of currency, and with the use of digital currency more and more lead to its demand should be more and more large, so in theory it should have the characteristics of deflation. For investors, they will make the expected judgment that the value of the digital currency will rise based on the limited nature of the total amount of money supply will increase, so they tend to continue to hold the money, resulting in a decrease of the money in circulation in the market, thus leading to a further increase in the value of the money. Such a cycle leads to deflation, and with fewer and fewer money in circulation, more and more people will exit the market, and the digital currency system will burst.

In terms of the value of digital currency, although, in theory in the digital currency network, every account can block chain building and issuing money, but the actual health is the issue of digital currency is still dominated by its initiator and a group of resources and strength, the actual issue of money is still in the hands of a few people[4]. However, in the actual digital currency market, because of its short development time, vague legal definition, and no need for credit guarantee, it is easy for speculators to control the market price through speculation, resulting in a large fluctuation range of currency value and high value risk.

3.1.2 Decentralization and security risks

Because of its decentralized characteristics, private digital currencies are not under the control of any country, institutions, organizations, individuals, etc. On the surface of it, it brings a lot of freedom to our trade, but in fact, it also brings more security risks. This caused the private digital currency is easy to become the target of hackers, market transactions based on each user's private key, and hackers through virus and platform access to the user's private key to steal the user's account and their digital currency, this process is not subject to any control, because once mastered the user's private key, it is equivalent to the behavior of free trade between users, it is difficult to trace, thus causing huge economic losses to users. For example, in early 2018 alone, there were two similar incidents: the Japanese digital currency exchange Coincheck stole the $523 million digital currency NEM, and the Italian cryptocurrency exchange BitGrail stole the $170 million digital currency Nano.

3.1.3 Anonymous nature and regulatory risks

Private digital currency is characterized by anonymity, which leads to many loopholes and risks in the supervision of it, which instead brings opportunities to criminals. The anonymity of the transaction makes it easy to escape the common financial scrutiny, and the transaction is difficult to trace, so it is easy to be used by criminals for money laundering, tax evasion, drug trafficking and other illegal and criminal acts.

The transaction process cannot be regulated in real time, and the real information of the transaction users cannot be traced, which is a very big problem for the supervision of the whole market. The lack of effective supervision and management institutions in the private money market has become a gray area for many criminals to conduct criminal transactions, which has caused a very bad impact on the society. The most familiar one is that the AlphaBay digital currency trading market was jointly shut down by the British and American governments because of a large number of criminals using it for criminal transactions.

3.1.4 Borderlessness and monetary risk

Private digital currencies are easily used because they are not issued by any country and have no borders in cross-border transactions. Once these digital currencies are widely circulated around the world, it will have a great impact on the existing sovereign currencies of many countries. Especially for those countries with relatively fragile sovereign currencies, they are vulnerable to these digital currencies, triggering the turmoil in the domestic fiat monetary system. And, on the other hand, due to the issue of digital currency access and technology level also has a great connection, this will lead to a lot of digital currency concentrated in a few developed countries[5], if these countries because of their own an event affects the value of the digital currency will trigger the global digital currency market turmoil, especially for developing countries, will bring great losses.

3.2 Advantages and influence of digital currency issuance by the central bank

With the continuous development of digital currency, its disadvantages and risks have been gradually realized by many countries, so more and more countries have joined in the research of fiat digital currency. The importance of the central bank's digital currency and its impact are discussed in this part.

3.2.1 The issuance of digital currency by the central bank can effectively save costs

First of all, the issuance of legal digital currency by the central bank can effectively reduce the cost of coinage. Digital currency is used to replace the cash in circulation, which no longer needs to spend a lot of manpower and financial resources on unified printing like paper currency, and it does not need to conduct centralized recovery, inventory and manual destruction, which reduces the processing cost. People in using digital currency, only need portable electronic devices such as mobile phones, and legal digital currency support offline payment, pay both sides in no network can also trade, this not only reduces the circulation cost of currency, but also not like existing WeChat and pay treasure to electronic currency worry about network problem. For the storage of money, it does not need to spend a lot of time and space as the traditional money, which greatly reduces the storage cost of money.

3.2.2 Centralized management of the use of digital currency issued by the central bank

Statural digital currency still adopts a centralized management mode, which is the biggest difference from private digital currency. The legal digital currency adopts a two-tier operation and management system, which is uniformly issued by the central bank to the commercial banks and commercial institutions at the next level, and then issued by these banks and institutions to the people. The unified issuance by the central bank makes the number of digital currency able to be regulated, and the credit of the country ensures the stability of the currency value. Legal digital currency has limited anonymity[6]. When using and trading, it is as anonymous as our current cash. It does not need to rely on the Internet or third parties to realize de-intermediation, which not only improves the transaction speed but also guarantees users' privacy and information security. However, it will still leave relevant traces on the digital currency network, of course, only the relevant regulatory and administrative departments are qualified to obtain it, which provides great convenience for the supervision of the market and can effectively prevent and crack down on illegal and criminal activities related to digital currency. At the same time, the centralized management mode also enables the country to carry out effective macro-control, formulate and introduce monetary and fiscal policies that are more consistent with the market, and promote the more stable and rapid development of the country.

3.2.3 The central bank issued a digital currency to promote the internationalization of the RMB

For China, the central bank's issuance of digital currency DC / EP will help promote the internationalization of the RMB. In today's international trade settlement, the United States and the US dollar are still dominant, which also became the United States to drive global financial hegemony and conduct financial intervention in other countries, and even launched a financial war as a privilege, which seriously

affected the international financial market. The natural characteristics of digital currency make it very convenient in cross-border payment. At the moment when the world is promoting the research of legal digital currency, the launch of DC / EP can allow RMB to take the lead in the international digital currency market. Existing RMB cross-border payment is based on the bank account, which requires foreign Banks need to have the related business, and pay overseas enterprises or individuals also need to open the corresponding RMB deposit account in the bank, the process is relatively cumbersome, and if you can use digital currency DC / EP, only need both sides have DC / EP wallet, very convenient, it has to expand the use of the yuan in the world. It is generally believed that the digital currency based on blockchain technology has natural advantages for international trade settlement, which can not only effectively improve the speed of international settlement, but also ensure the security of transaction settlement[7]. With China's influence and voice in the world, the promotion of the central bank's digital currency will further promote the process of RMB internationalization.

4. Challenges for the central bank in issuing the digital currency

4.1 Challenges in information technology

The problem that the central bank must overcome in issuing legal digital currency is the requirement for information technology. Digital currency is based on blockchain technology, including distributed ledger, digital encryption, peer-to-peer transaction transmission and other technical issues, and puts forward requirements for the speed of data processing, information storage and information security.

First of all, there are high requirements for computing power in transaction settlement and data processing. For general information processing, we can increase the computing power by increasing physical resources, such as increasing CPU, GPU, server and other resources. However, for a distributed ledger based system, every operation of your system will be completely calculated and stored on every distribution node, so simply improving the physical resource equipment and nodes cannot provide a significant linear improvement in the computing power of the system. In the current private digital currency trading market, transactions such as Bitcoin and Ether can only peak at about 20 transactions per second, while Libra, launched last year, can only handle 1,000 transactions per second according to its white paper. This with our daily use of currency trading processing capacity has a big gap, for this populous country, support our normal life needs to reach at least 50000 transactions per second processing capacity, it is not to consider like double tenth a shopping carnival such extreme cases, according to the double tenth shopping festival taobao peak can reach thousands of transactions per second. Therefore, in order to realize the large-scale trading use of digital currency, the information meter processing technology still needs to be greatly improved.

Secondly, a large number of transactions also set high requirements for the storage of data. Based on the characteristics of distributed technology, every node in the system needs to store all the transaction information in the system, which has a very large demand for the node storage space. Existing Bitcoin nodes need to store about 100G of data, while Ethereum needs about 50G, and these digital currencies are currently relatively small and limited[8]. Once fiat digital currencies are issued and circulated in the country, frequent transactions pose a huge challenge to the storage of large amounts of data.

Finally, and most important, is the improvement of information security technology. In terms of the existing private digital currency, despite the use of cryptographic encryption technology, is only to ensure the relative security and tamper-proof of the transaction, for the privacy of users and account security lack of effective protection, due to the theft of property loss of digital currency often happen in the world. For the digital currency issued by the central bank, it is not only related to the security of every user, but also related to the security of the national currency information[9]. Therefore, in the underlying design of legal digital currency, it is necessary to find more secure encryption algorithms. How to explore the most suitable information security technology on the basis of blockchain technology has become a difficult problem that must be overcome.

4.2 Legal and regulatory challenges

China's legal digital currency is still in the state of research. In theory, the relevant laws, regulations and regulatory systems should be formulated before its official issuance. At present, China's monetary laws and regulations are all implemented based on traditional paper

money and coins. For some private digital currencies in the world, there is lack relevant legal provisions to regulate and restrict their use and circulation, and there is also a lack of relevant regulatory agencies, which is what we need to strengthen.

For digital currency, it is based on the network and various kinds of information technologies, which is completely different from our traditional currency, so more targeted laws and regulations are needed to regulate it. How to formulate the corresponding laws according to the characteristics of digital currency'technical means, circulation mode and privacy security is an important problem now. For the existing legal provisions related to legal tender, such as the Law of the People's Republic of China on the People's Bank of China and the Regulations on the Administration of RMB of the People's Republic of China, corresponding amendments should be made according to the digital currency to clearly identify the issuance and legal effect of the central bank's digital currency. Only by improving the relevant regulations on the digital currency of the central bank can we actively promote the issuance and use of the digital currency, so as to ensure a smooth and safe transition of the whole monetary system.

In the circulation and use of digital currency, more specialized and effective regulatory strategies need to be developed, especially in the cross-border use, and they also need to meet the regulatory requirements of all countries in the world. Therefore, while setting up professional institutions in China for the management of digital currency, it is also necessary to discuss and cooperate with other countries in the world to jointly prevent financial crimes such as money laundering and tax evasion by using digital currency through transnational means. The development of digital currency will bring some new financial business and financial form, it is easy to appear the possibility of new arbitrage and speculation, so it also put forward new requirements and challenges for financial regulation, only in this kind of new regulatory follow up and breakthrough, to maintain the stability of the money market and financial system.

4.3 Challenges in the circulation environment

The promotion of the central bank's digital currency nationwide will be a huge task, especially for China, which is leading the world both in terms of population and economic volume. Therefore, it is an important challenge both in the popularization of digital terminal equipment and in the actual application scenarios.

The future use of the central bank's digital currency is based on the circulation of mobile devices. At present, the use of almost all mobile terminals is based on smart phones. According to statistics, the number of people with smart phones in China has exceeded 750 million, but this also means that nearly half of the population does not have smartphone terminals and related use experience. Especially for some older people, the use of smart phones, especially the more complex functions, is difficult. In addition, for the people in more remote areas, the popularity of smart phones and the construction of related equipment projects are still limited. Therefore, the circulation and popularization of digital currency of central banks needs the promotion of the construction and development of digital terminals and related equipment.

The central bank digital currency faces great challenges in the future application scenarios. It takes a long time to accept traditional paper currency, and it took more than a decade for electronic payments such as Alipay and WeChat to develop user habits. Therefore, in the popularization of digital currency, how to realize the habit conversion of the use of currency is what we need to consider. Especially in the early stage of the implementation of digital currency, it is necessary to build supporting application scenarios, actively guide the masses, and encourage the transaction of digital currency. We can consider the technical and application cooperation with the current two major mobile payment platforms Alipay and WeChat to jointly promote the circulation and use of digital currency.

4.4 Market and policy challenges

Central bank, digital currency, as a new form of money, will inevitably bring new challenges to the regulation of the existing money market and the formulation of economic policies.

For the market, if the domestic economic fluctuations, the people will tend to store more high security and liquidity is also good assets[10] , while the digital currency has become a good choice, if people choose to bank deposits into digital currency, then will cause a run on commercial Banks. Therefore, we need to avoid this kind of situation as much as possible in the implementation.

For macroeconomic policy, the central bank needs to the money supply structure, the circulation transmission mechanism to set, need

to study to build more targeted more efficient new model to predict and control, and, so that the implementation of digital currency related economic policy can effectively stimulate the market and ensure the stability of the financial system, guard against financial risks.

5. Meeting its challenges and pursuing its future prospects

In the face of these many challenges, we need to actively deal with them. In terms of information technology, it is necessary to further increase the research and development of information storage and information settlement technology, and build a safe and complete information system, which needs to cultivate more and more compound talents proficient in financial technology to promote it. In terms of laws and supervision, it is necessary to adjust and improve the relevant laws and regulations of currency to establish the legal status of the central bank's digital currency. At the same time, it should also promote the construction of the regulatory system of digital currency, so as to establish a financial system of legal digital currency. In terms of circulation environment, the promotion of the central bank's digital currency can be publicized and guided through small-scale pilot, and some scenarios in daily life, such as public transportation and vending to promote the circulation and use of the central bank's digital currency step by step. In terms of market and policy, targeted monetary policies are necessary to be formulated. While experts conduct in-depth research, sufficient practical investigation should also be conducted to ensure a smooth transition from traditional currency to digital currency.

Although there are still many problems and challenges in the issuance of legal digital currency in China, we have clearly realized that digitalization will be the future of currency development, and we are also actively investing in the research of the central bank's digital currency DC / EP. It is believed that after overcoming various technical problems, we will find the appropriate application scenarios for pilot, and further improve relevant laws and regulations. At this time, the era of digital currency will come. Our use of money in our daily life will be more convenient and convenient, and China will also have more say in the world monetary system.

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