Development and Supervision of Digital Cash from the Perspective of Evolution of Monetary Form

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Abstract

The emergence of digital cash is a product driven by technological progress, and the issuance of sovereign digital cash by the central bank may represent the monetary development direction in the future digital age. Nowadays, with the rapid development of information technology, the integration of network technology and traditional finance is gradually accelerated, and digital cash appears and attracts attention. This paper combs the origin of technology and practice, the evolution of theoretical model and the progress of practice in digital cash, trying to sum up the evolution law and trend of digital cash, and analyze the possible influence of digital cash on sovereign countries and global financial system. This paper attempts to sort out the development context of digital cash in combination with the evolution of monetary form, and further infer the development direction of digital cash and put forward reasonable suggestions according to the contradictory factors.

Keywords

Monetary form; Digital cash; Supervision.

1. Introduction

In 1980s, David Chom put forward the first digital cash scheme. Up to now, digital cash represented by Bitcoin//BTC, Ethereum//ETH and Litecoin//LTC are emerging one after another, and digital cash technology represented by blockchain is developing rapidly [1-2]. His theory and his research on E-cash have aroused researchers’ interest in digital cash, but the model established by him is still the traditional tripartite model of "bank, individual and business". The evolution history of human currency is generally developed along two main lines: from the monetary level, monetary history is the evolution process of monetary form and attribute; From the national level, currency history is the course that the state controls the right to issue currency [3]. With more and more countries making relevant laws in digital cash, and the influence of blockchain is increasing, the prospect of digital cash is getting more and more attention [4]. So, how to treat the digital cash phenomenon, and how far has the theoretical research progressed? What is the practical significance of the exploration of sovereign digital cash carried out by the world’s major central banks represented by the People’s Bank of China? It can be predicted that, on the basis of the maturity and perfection of the underlying technologies such as blockchain and Internet, the connection between digital cash and social application scenarios will become closer and closer, and digital cash is likely to become the next new focus of competition among countries. Below, the author combs the development and supervision of digital cash based on the perspective of the evolution of monetary form.
2. Commercial Development and Evolution of Monetary Form

2.1. Summary of the Development of the Shape of The Goods

It is generally believed that in the long process of human economic history, the evolution of the shape of goods has gone through four processes. First, physical goods, second, metal goods, third, paper goods, and fourth, electronic goods. The electronic goods here are mainly a kind of payment means based on electronic accounts, through the Internet for payment and account settlement. To a certain extent, private digital cash can satisfy the value scale of money and the function of exchange medium. The European Banking Authority (EBA) calls digital cash “virtual currency”, which is a digital representation of value, neither issued by the central bank or authorities nor linked to legal tender. Because it is accepted by natural persons and legal persons, it can realize electronic transfer, storage or transaction, and can also be used as a means of payment. Bitcoin belongs to the foundation of digital cash technology, and decentralized, trusted system without trust, point-to-point transaction, global payment, extremely low handling fee, and irreversible transaction are the basic characteristics of digital cash [5].

2.2. The Rise of Commerce Has Promoted the Change of Physical Goods Form

Generally speaking, the emergence of currency precedes the emergence of the country. Before the emergence of the country, physical currency, as an equivalent spontaneously formed by the people, participated in commodity circulation. In the Neolithic Age, shellfish currency was used in the coastal areas of Africa, the northern islands of New Guinea, Australia and Solomon Islands. As a new kind of goods that are more suitable for commerce and commodity circulation, paper has emerged. Paper is easy to produce and carry, and it is not scarce, so it is a good carrier for commercial development; As for the original currency such as shells and ivory, although its own use value is not very sufficient, its exquisiteness or scarcity and natural value can also determine its endogenous credit and become a generally accepted credit item. From paper money to electronic money, it is the application of computer technology. Today's digital cash is directly related to the application of Internet, cloud computing, blockchain and other technologies.

2.3. The Development of Modern Commerce Promotes the Continuous Evolution of Credit Goods

Thanks to the progress of technology, the forms of commerce and goods have been developing and evolving since modern times. At any time, the unification of futures currency can not be guaranteed without the national coercive force. The state conducts the unification of currency in the form of laws and regulations, including the unification of materials, specifications and characteristics. The prohibition of private currency issuance by state power also increases the cost of choosing other currencies. People only choose the monetary system with the lowest transaction cost, that is, the national currency. Therefore, the centralization of money is attributed to the forcible restriction of state power on the one hand, and the natural evolution of money on the other hand [6]. Commodities are gradually developing towards non-materialization, even intangible, virtual and digital. This makes tangible paper less and less able to meet the more efficient and digital business needs. Therefore, various types of electronic goods based on Internet payment system came into being.

2.4. Electronic Money and Digital Cash

Electronic money is the product of the development of electronic information technology at a certain stage. Since its emergence in the 1970s, its application fields have become more and more extensive. The evolution of the form of goods and currency is just adapting to the basic needs of the convenience of the exchange process, and gradually changing from valuable
physical currency to credit currency with no intrinsic value guaranteed by national sovereignty. Although the electronic non-legal currency is stored in legal currency, it has not been freely exchanged with legal currency, so it is only suitable for one-way network virtual environment. Its advantage lies in improving the efficiency of centralized bookkeeping, but its disadvantages are also obvious: the whole network takes a long time to confirm and the transaction records are untraceable, which makes bitcoin easy to be hoarded and used for money laundering or other speculative activities, and the currency value fluctuates greatly.

Digital cash does not appear out of thin air. It originates from electronic payment, evolves from electronic money and virtual money, and gradually separates from electronic money and network virtual money. In actual experience, digital cash and electronic money operate in a similar way, but there are essential differences between them [7]. According to the historical process, the process of unification and control of currency by the state is the process of strengthening the form and attribute of currency by using power and organizational ability. The unification of material, specification and characteristics of money is the strengthening of external form, which makes money conform to the nationwide circulation. Although the concept of number has been discussed by many parties since it was put forward, its essence is still a kind of credit goods. At present, there are many shortcomings in both theory and technology of digital goods, so it is too early to launch digital goods, and some theoretical problems, such as the level of goods, supervision mechanism, circulation and management standards, need further discussion.

3. The Concept of Digital Cash

The essence of digital cash is "a new type of currency which is generated by the continuous development of Internet technology and distributed and circulated on the Internet in the form of encrypted data", as a currency substitute in the form of electronic data. According to the report of the Bank for International Settlements (BIS), digital cash is a kind of electronic money, but it is obviously different from traditional electronic money. Its main feature is decentralization, which can realize point-to-point transaction, coordination and cooperation based on decentralized credit in distributed systems where nodes do not need to trust each other by means of data encryption, timestamp, distributed consensus and economic incentives, thus providing an optional solution to solve the common problems of high cost, low efficiency and unsafe data storage in centralized institutions. Using digital goods may be simpler and faster, and it is also convenient for administrative departments to strictly supervise this part of funds, so as to avoid illegal transactions, fund-raising, fraud and money laundering.

4. The Development Process of Digital Cash

4.1. Cipher Currency

Digital cash's statement can be traced back to the 1970s and 1980s, when scholars began to study digital cash in combination with cryptography principles. In the traditional payment and clearing system, customers must open their own accounts in commercial banks, and transactions between customers are mainly carried out through account transfer. The bank is responsible for the record of each transaction, and the bank's clearing work needs to be carried out based on accounts. The first quantum symmetric cipher, because encryption and decryption share a key, this encryption method is simple, but it has great limitations and is not suitable for large-scale popularization and application; According to the actual development of the Internet, digital cash has achieved cross-regional circulation all over the world, and electronic money is always a regional currency. Most countries in the world adopt a strict regulatory attitude towards private digital goods represented by Bitcoin, and accept its transactions into the existing regulatory framework, and apply relevant regulatory laws and regulations.
4.2. Virtual Currency
Domestic scholars begin to understand digital currency from virtual currency. Qian et al. [8] began to pay attention to the network virtual currency, and defined the generalized network virtual currency as the information flow or data flow that replaces the real currency circulation in high technology. In a narrow sense, network virtual currency has the function of payment, which is issued by various network institutions, can not realize the real value, can not transfer money through the bank, and can only circulate in a specific network world without forming a unified issuance and management standard. Yong Chi [9] summed up electronic money as follows: issuers tend to be scattered, circulation breaks through sovereignty, transactions are more secret, transaction process is safer and transaction costs are lower. In China, the main form of existence of digital cash is speculative “investment products”. In some countries, bitcoin is traded as a commodity. Traditional commercial banks will not be able to implement partial reserve system under the influence of blockchain technology that digital cash relies on, and the resulting loss of currency creation function will have a far-reaching impact on commercial banks and economic development.

4.3. Stable Currency
Digital cash-stable currency, which aims at "stability", tries to achieve the purpose of keeping the currency value stable by anchoring legal tender, starting from optimizing the issuing rules. Interoperability, that is, the underlying technology must conform to internationally accepted standards and frameworks; Reliability, that is, it can effectively avoid network attacks and various fraudulent means. The goods themselves should have low transaction costs to reduce the overall transaction costs, mainly due to high payment and circulation efficiency and low distribution and management costs. However, with the evolution of attributes, the close degree of the direct relationship between money and commodities has decreased, and with the development of modern financial industry, the leverage effect of financial capital makes the application field of money expand unprecedentedly, and the distance between the real economy related to commodity circulation is widening day by day. The vigorous development of digital cash can make banks and other financial institutions aware of the shortcomings in their own operations, and then continuously improve their services to improve their market competitiveness.

5. Regulatory Suggestions for Digital Cash
5.1. Establishment of Digital Cash Supervision Committee
Each country can separate the supervision work in digital cash, and set up the digital cash Supervision Committee to take charge of this work, supervise the issuance, circulation and management of digital cash in real time, find problems in time, and ensure the normal operation of the digital cash system. For example, the U.S. Federal Tax Department classifies digital cash as "property", the U.S. Treasury Department classifies it as "value" due to anti-money laundering and counter-terrorism, and other jurisdictions adopt other classification methods according to the nature of their own departments. These differences make it much more difficult to supervise digital cash. China can select a "experimental field" to try to implement the digital cash first, and combine theory with practice, so as to lay a good foundation for the supervision of digital cash in the current market and the legal digital cash that may appear in the future.

5.2. Provide Support for Financial Technology Innovation
In the central bank's supervision of digital cash, attention must be paid to digital cash's shared financial concept and its close connection with the development of finance and information technology. Therefore, the central bank's supervision of digital cash should provide support for
financial technology innovation. Digital cash has the function of preserving value, which will stimulate people to hoard money and lose the circulation function as money. Moreover, digital cash has not yet formed a credit base. As far as the current development is concerned, it is difficult for digital cash to become the mainstream monetary system to replace the existing monetary system in the short term, but it may become a good supplement to the existing monetary system.

5.3. **Formulate Relevant Rules and Regulations for Supervision in Digital Cash**

Governments of all countries should clarify the legal status of digital cash, actively formulate and improve the regulatory laws of digital cash, so that the regulatory authorities can have rules to follow in the process of development, punish and sanction some lawless elements through relevant laws, and effectively control and prevent disrupting the order of the financial system and money laundering activities; Digital cash has the function of peer-to-peer transaction, and it is easy to conduct individual-to-individual transactions outside the market. Therefore, with regard to the regulatory measures, some suggestions are put forward, such as clearing and normalizing the system, and improving the executive power of the system. Therefore, the central bank should also establish a personalized dynamic monitoring system based on financial technology. In order to reduce the information asymmetry in the transaction process of digital cash, attention must also be paid to the design of one-dimensional mechanism to multi-dimensional mechanism based on this system. In this way, we can reduce the incidence of illegal activities to a certain extent and ensure the stable operation of the digital cash market.

6. **Conclusions**

From the historical process of centralization, money has gone through the decentralization of barter exchange to the primary centralization in the coinage stage. In the gold standard period, it has gone through two different stages from decentralization to centralization enhancement, and in the era of national sovereignty, it is a strong centralization stage dominated by credit currency. Based on the evolution of monetary form, digital cash has broad prospects for development. On this basis, the practical value of the research is proved by the specific strategic suggestions involved in this paper, such as bringing digital cash into the legal supervision system, providing support for financial science and technology innovation, and strengthening risk supervision in digital cash. In the international monetary system, the realization of super-sovereign digital cash also depends on the joint support of digital cash’s theoretical innovation and digital cash’s practical policies of various countries, and it also needs the active coordination and promotion of international organizations and the construction of corresponding institutional framework.

**References**


