



Exploration of the Problems of Virtual Currency and Potential Solutions

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Abstract. In recent years, virtual currency has become an international hot topic. At the same time, virtual currency also ushered in unprecedented development. How to effectively regulate virtual currency becomes a problem worth discussing. This paper first analyses the development of virtual currency with Bitcoin as the representative. It is concluded that virtual currency has great instability, which means that there are some problems with virtual currency. The problems of virtual currency are mainly reflected in the potential impact on the market and loopholes in legal regulation. Therefore, the regulatory measures proposed in this paper are also analyzed from two aspects of market operation and legal regulation. In addition, Central Bank Digital Currency (CBDC) is also a good idea.

Keywords: Cryptocurrencies · Virtual Currencies · Digital Currencies · Central Bank Digital Currency (CBDC) · Fintech

1 Introduction

1.1 Background

Virtual currency can be dated back to 1974, when Friedrich von Hayek, a British scholar who won the Nobel Prize in economics, proposed the idea of using computers to establish a more reliable monetary system than relying on national credit. On January 1, 2008, Satoshi Nakamoto put forward the concept of bitcoin. Now it seems that it has almost changed the world's financial operation for hundreds of years. Only 10 years later, on May 4, 2017, the value of bitcoin broke through 1,500 dollars for the first time and the market value of bitcoin reached over 25 billion dollars, reaching the peak of BTC: USD about 1: 20,000. Now, its value is over 40,000 dollars. Bitcoin pioneered a decentralized cryptocurrency, but it is not perfect. It was not until 2013 that the programmer Vitalik Buterin first proposed the concept of Ethereum inspired by bitcoin to the effect that "the next generation of cryptocurrency and decentralized application platform". Ethereum is

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designed to solve the problem of insufficient scalability of bitcoin. Because Ethereum offers open source technology, it makes it very easy for many people to issue a virtual currency. Therefore, after 2015, many types of virtual currency were born. However, the attributes of virtual currency cause its problems, many illegal activities are related to virtual currency such as it is used as a tool for money laundering by criminal groups. Analyzing the attributes of virtual currency deeply is necessary. To solve the problems of virtual currency, many countries enhance their supervision of virtual currency. On September 4, 2017, The People's Bank of China (PBOC), the Internet Information Office, the Ministry of industry and information technology, and other seven departments and units jointly announced preventing the financing risk of token issuance, proposing clearly to prohibit virtual currency transactions. However, is this policy reasonable? This is a problem that needs discussing. It is significant to clarify what types of regulation policies are reasonable and practicable.

In recent years, more and more countries and organizations have put forward their virtual currency regulation measures, such as Japan, the United States, the European Union, Hong Kong, and the Chinese mainland. The current regulations imposed by Chinese mainland authorities are very strict and very different from those in other countries. Although the Chinese mainland issued such regulatory measures to crack down on criminals' increasingly rampant use of virtual currencies for money laundering, the advantages of virtual currencies in the field of financial transactions cannot be ignored. Virtual currencies have both advantages and problems, the key to the government's management of virtual currencies lies in the application of regulatory measures. In addition, the PBOC has issued the digital RMB with the nature of legal tender, and other countries have also issued digital currencies. The issuance of digital currencies has given the world a new way to regulate virtual currencies.

1.2 Related Research

According to the Mt Gox Case, Ishikawa thought that some issues about virtual currencies that emerged during the debate are still unresolved. It is necessary to review the regulations that are appropriate for financial actors operating in virtual currencies. In addition, the issues of customer/user protection, which is the result of the Mt Gox incident, must be considered [1]. Fang and Wu research some attributes of virtual currency and its regulation. Virtual currency's history is not fairly long, there are some issues people are not clear about, such as its attributes and how to regulate it. Fang and Wu discussed four attributes of virtual currency, commodity attribute, currency attribute, "virtual" attribute, and legislation attribute. They gave five recommendations for virtual currency regulation including an access system, virtual currency censorship, an early warning mechanism, a crisis management mechanism, and improved technology management [2]. At present, China not only lacks effective protection of virtual currency in the field of private law but also negates it wholly in the field of public law. Zhao thought that the government should protect private law in the view of civil law after realizing the legal attribute of virtual currency. According to dominance theory and public governance theory, in addition, the government should build a reasonable investor system, financial consumer protection system, anti-money-laundering supervision system, and international cooperation regulatory system [3].

China has issued a central bank digital currency (CBDC). China has been carefully designing its version of digital currency and issuance mechanism with the purpose of not disrupting financial intermediation. Shen and Hou propose to use interest rates as a policy solution to mitigate the narrow bank concern. On its face, the CBDC is more like a regulatory toolkit, but essentially, the CBDC is a payment tool that embodies the basic functions of fiat currency [4]. Islam et al. used a variety of methods to analyze cryptocurrencies and compare them to the characteristics of currencies and derivatives to determine the categorization of cryptocurrencies. They found that bitcoin behaves more closely to technology-based products, emerging asset classes, or bubble events, and argued that existing monetary and securities laws do not apply to cryptocurrencies [5]. Makurini and Tarasova used a descriptive approach to the analysis of the main business and accounting characteristics of cryptocurrencies to determine the method of valuation of assets received from mining and bartering in cryptocurrencies. They argued that when using virtual currencies for transactions, special attention should be paid to measuring the consumption value of certain goods or assets [6].

Riley reviewed the current cryptocurrency regulation and in particular some of China's measures in this regard, including an analysis of current Chinese cryptocurrency laws and the new Chinese cryptography law. It also explained the role of recent developments in Chinese regulatory policy in shaping the development of the global cryptocurrency market [7]. Pelucio-Grecco et al. tried to give their view on the accounting treatment of bitcoins. They analyzed the characteristics of bitcoins and compared them with the concepts of IFRS. They suggested that the most appropriate procedure is the foreign currency procedure, although it is contrary to the tax treatment of official bodies in Brazil and the United States [8].

After reviewing the recent literature on FinTech, Allen et al. provided an overview of China's experience in this area, including payments, digital banking, FinTech lending, and the recent progress of the central bank's digital currency pilot (e-CNY). They also discussed the relevant laws and regulations and regulatory measures. They argued that with effective regulation, e-CNY can become mainstream in the global market [9]. Even though the leading theory is that Bitcoin has no value due to it not being backed by a government that has tax and spend authority, Alstyn's research results on the bitcoin confirm that it already has a value of four-part. Firstly, the double-spend problem has been solved by Bitcoin's technology, Secondly, with the assistance of the Bitcoin network, there is no transaction cost. Thirdly, Bitcoin is better than credit cards at detecting fraud because each transaction requires public authentication from buyers and sellers. And most importantly, tons of people, organizations, and governments have accepted it [10]. Underwood identified that blockchain capabilities extend far beyond the basis of cryptocurrencies such as bitcoin. Due to the immutable, transparent, and redefines trust enabling secure, fast, and transparent solutions that can be public or private, it is expected to revolutionize industry and commerce and drive economic change on a global scale. And then Underwood give example from the following three aspects to list the advantages and existing problems: Financial Applications (Audit and assurance), commercial applications, and their use in developing countries. Finally, Underwood gives a summary that the revolutionized applications and drive global economic change are certainly there, but the problem persists in wide-scale execution [11].

1.3 Objective

The purpose of this paper is to analyze the development status and existing problems of virtual currency to put forward reasonable regulatory measures. In the second part, this paper will take Bitcoin, the representative currency of virtual currency, as an example to clarify the main characteristics of virtual currency. Through the analysis of the price trend of Bitcoin in recent years to show the development status of virtual currency. In the third part, this paper will analyze the three main problems of virtual currency. In the fourth part, this paper will put forward the regulatory measures for the existing problems of virtual currency. Finally, the conclusion will be drawn in the fifth part.

2 The Development Status of Virtual Currency

The virtual currency we discuss in this article only refers to the universal virtual currency that can be converted to legal tender or other virtual currencies, so it can perform the three basic functions of currency value storage, trading medium, and denomination unit. It is important to note that virtual currencies do not specifically refer to “decentralized” and “distributed”, so they do not contradict the definition of fiat currency endorsed by government credit. With the cryptocurrency boom, there are still more than 5,000 cryptocurrencies that have been ruled out of scams or scams, and their values vary widely. Some of them have tens of thousands of US dollars in value, such as Bitcoin while some of the virtual currencies are only worth less than one dollar. One of the most well-known is the originator of virtual currency - Bitcoin. Its value has greatly impacted the original monetary system, monetary policy, and financial markets from the emergence of the original Bitcoin. Cryptocurrency currencies represented by Bitcoin have the following three characteristics.

2.1 Features of Bitcoin

2.1.1 Decentralization

Bitcoin’s decentralization is not the decentralization of the whole process, only refers to the decentralization preset within the consensus of the algorithm, and only to the distributed bookkeeping method contrary to the traditional meaning, so that the book-keeping is no longer held by an individual or institution, which enhances the credibility of the bookkeeping.

2.1.2 Differences in Credit Endorsements

Traditional paper money is a non-sufficient currency issued with gold, government credit, etc. as security. Bitcoin, on the other hand, is in the form of a currency that always exists electronically, with algorithms as a guarantee for credit. The use of algorithms as a guarantee does exist as the computer’s computing power increases, the value of virtual currencies decreases, and anonymized transactions are destroyed.

Table 1. Statistic of the data

Statistic	Value
Median	6413.79248
Standard Deviation	16510.0812
Variance	272582781
Range	67388.7251
Minimum	178.102997
Maximum	67566.8281

2.1.3 Limited Quantity

In theory, currencies secured by government credit can be issued without restriction, but the number of bitcoins issued is set at 21 million. That said, its limited number contributes to its scarcity and becomes one of the reasons for the rise in the price of Bitcoin. But at the same time, its fixed number also undermines the macroeconomics in which the government influences the economy by regulating the money supply. The failure of monetary policy will be a subversion of the original economic system.

2.2 The Price of the Bitcoin

As one of the investment assets, the value of the venture currency must be a concern to the investors. Therefore, we used SPSS to analyze the price of Bitcoin from 2014 to 2022 to find the reason for its price change.

The numbers in Table 1 analyze the adjusted closing price of bitcoin from September 17th, 2014 to April 15th, 2022. Through the analysis, since 2014, the price of Bitcoin has fluctuated greatly, with the lowest price of 178.103 US dollars and the highest of 67566.828 US dollars. As an investment asset, its price is completely instability.

2.3 The Factor of Price Change

To show the fluctuations in the price of Bitcoin more clearly, the price movement chart from 2014 to the present is drawn through the line chart.

Based on Fig. 1, the price of Bitcoin has shown an overall upward trend since 2014, especially in the past two years, when the price has fluctuated more sharply. From the table, it can be found that there are three significant price fluctuations. 1. In the third quarter of 2017, it ushered in the first upward climax and began to decline after reaching the highest value in early January 2018. 2. In early November 2020, it ushered in a rapid growth trend, from \$13,737.11 on November 1, 2020, to \$63,503.46 on April 13, 2021, and quickly fell back to about \$30,000. 3. After bottoming out in July, a new round of growth began, reaching its peak on November 8, 2021, and then falling rapidly to around \$40,000 again, with less price volatility in the first quarter of 2022.

Bitcoin price fluctuations have a clear connection with government and international political, and economic situations and its unique attributes which will be discussed separately.



Fig. 1. Price trend of bitcoin from 2014 to 2022

2.3.1 2017–2018 Bitcoin Price Fluctuations

①In the third quarter of 2017, the United States, the European Union, Japan, China, and other major international economies continued to recover, employment rates rose, and the UNEMPLOYMENT rate in the EU even reached the lowest in recent years. The improvement in the economic situation means that the number of investments has increased. In the context of the rise in house prices in China, Bitcoin has received a pursuit from investors. At the end of 2016, Bitcoin was listed among the “six most profitable” events given by Central Finance and Economics.

②On July 10, 2016, with the birth of Bitcoin’s 420,000th block, Bitcoin block production ushered in another halving, and the block reward after the halving was 12.5 BTC. According to the relationship between supply and demand, as the supply decreases, the market is more willing to pay higher consideration to pay Bitcoin. This became the reason for the surge in the price of Bitcoin.

③In addition, the foreign exchange controls imposed by the Central Bank of China at the end of 2016 also gave Bitcoin a break the limit of 50,000 single or cumulative conversions per person per year. After a nearly 20-fold surge in bitcoin in early 2018, it began a downward trend. The irrational growth in 2017 was the direct cause of the decline in 2018, but at the same time, leveraged trading through bitcoin futures led to a surge in the number of speculators, and short trading prompted the price of bitcoin to fall. In addition, the limitations of blockchain technology and the current situation of incomplete development have reduced investor confidence after calming down and exacerbated the process of decline.

2.3.2 2020–2022 Bitcoin Price Fluctuations

①The same as the 2017 surge, the direct reason for the price increase of Bitcoin is that Bitcoin began to halve for the third time at a block height of 630,000, and the block reward was reduced from 12.5 BTC to 6.25 BTC. Scarcity has once again triggered a boom in the market.

Since the outbreak of the new crown epidemic in early 2020, it has gradually spread to the world and the new crown virus has continued to mutate, the economies of various

countries have continued to be sluggish, corporate profitability has weakened, the stock market in the traditional financial market has fluctuated greatly, the yield of the bond market has been low, and the fluctuation of inter-country currency exchange rates has intensified. Bitcoin, as a virtual asset, has little to do with the original financial market and has become a safe-haven asset sought after by investors, especially young investors.

②Due to the rise in the price of Bitcoin, the participation of large investment institutions such as Jefferies in Bitcoin investment has further increased the price of Bitcoin.

③Elon Reeve Musk's attitude towards Bitcoin has directly affected the attitude of investors and speculators in the market, and its acceptance of Bitcoin payments and the transfer of Tesla's negative interest rates in European banks through Bitcoin have stimulated the rise in Bitcoin prices. The growth in the value of Bitcoin is bound to be of concern to governments. Transactions in Bitcoin are partially and to varying degrees restricted. For example, on May 18, 2022, the Banking Association of China and other departments jointly issued the Announcement on Preventing the Risk of Speculation in Virtual Currency Transactions. It is emphasized that financial institutions, payment institutions, and other member units shall not use virtual currency to price products and services, and directly or indirectly carry out business related to virtual currency. At the same time, the huge consumption of resources and the environment by bitcoin mining has also caused social dissatisfaction.

Based on the above analysis, we can find that there is a huge instability in virtual currencies. Government policies, public opinion, macroeconomic trends, and investor psychological expectations all greatly affect the price trend of Bitcoin. The following will be a detailed analysis of the existing problems and solutions to virtual currency.

3 The Problems of Virtual Currency

3.1 Potential Impact on the Existing Market

On one hand, virtual currency issuers do not arrange a corresponding cashback mechanism, which may lead to market chaos. The virtual currencies in the hands of holders can generally only be left unused or sold through various platforms, which has contributed to the formation and prosperity of the underground market for virtual currencies. In an underground market that operates in a disorderly manner, the scope of use of virtual currencies may be arbitrarily expanded to achieve two-way exchange with legal tender. In addition, some dealers even make huge profits by acquiring and selling virtual currencies at low prices in the underground market, and there are even virtual currency "dealers" and "money changers" on the Internet. This may lead to the disruption of the currency circulation order and the increasing chaos of the virtual currency market.

On the other hand, if virtual money can buy physical products, it is easy to lead to inflation. Inflation is a general and sustained increase in prices. The most ideal way to determine whether there is inflation in the economy is to measure it directly by the change in the general price level.

According to the Cambridge Equation, the relationship between the quantity of money and the price level of goods is given by:

$$MV = PQ \quad (1)$$

M is the quantity of money in circulation, V is the velocity of money circulation, P is the price of the commodity, and Q is the total quantity of the commodity.

Assuming that the velocity of money circulation V is constant.

①If virtual money cannot be used to buy physical products, then only M units of legal tender flow among physical goods, and the price level P is constant in the case of a certain quantity of goods. So in this case, virtual money will not bring inflation to real society.

②If virtual currency can be purchased in kind on some physical electronic trading sites, such as Taobao, then the number of goods Q purchased with the legal tender will be reduced to Q_1 ($Q_1 < Q$), which can be obtained from the Cambridge equation:

$$P = MV/Q_1 \quad (2)$$

MV remains unchanged, P increases, the legal tender depreciates, and inflation occurs when commodity prices rise generally and consistently.

3.2 Loopholes in the Relevant Legal Regulation

First of all, virtual currencies are easily used by lawless elements for money laundering, gambling, and other illegal and criminal activities. The transfer of virtual currency can be independent of distance and has strong anonymity, and at the same time, it is difficult to supervise, forensic, and punish network transactions, so the cost of using virtual currency for money laundering and gambling is relatively low compared with other conventional channels, which becomes a good choice to carry out related crimes.

Secondly, no special regulatory body was established and the distribution of authority was unclear, resulting in a regulatory vacuum. In China, for example, the government has passed a new cryptography law in the past two years and it has come into effect [8]. Since there is currently no specially established regulatory body for virtual currencies [2], the phenomenon of multiple departments setting laws and regulations together has emerged. Through our investigation, we can know that the Ministry of Public Security, the Ministry of Information Industry, the Ministry of Culture, the General Administration of Press and Publication, the People's Bank of China, the Ministry of Commerce, and the State Administration of Taxation have all been involved in the regulation of virtual currencies. However, as a special kind of currency, these departments cannot fully regulate virtual currencies from the perspective of their special property rights attributes. In the absence of a unified institution leading the regulation, the division of responsibilities is unclear, which easily leads to the problem not being truly solved.

Thirdly, due to the lack of regulation of virtual currency, virtual currency is in a completely laissez-faire state, and the legal rights and interests of the majority of Internet users are difficult to be effectively protected. At present, the domestic law lacks corresponding management regulations for the protection of personal virtual property, and the law enforcement authorities are in a situation where they cannot rely on the theft of players' virtual property after reporting the theft.

Last but not the least, the root cause of various problems in the field of virtual currency lies in the lack of strict issuance access mechanism and licensing system, almost any network service provider can issue virtual currency according to their own will. The

issuers of virtual currencies are the providers of online goods and services, and their main purpose of issuing virtual currencies is for the development of their online services and the need to sell online goods. The nature of the businessmen is profit-seeking, and their ultimate goal is to maximize their profits.

In this context, if the issuance of virtual currencies lacks proper access conditions and licensing system, it will lead to more social, economic, and legal problems in the long run.

3.3 A Class of Virtual Currencies Represented by Bitcoin is Risky and Costly

One problem is the huge energy consumption of mining bitcoins, which runs counter to the concept of green development of human beings. Compared to the amount of electricity consumed by countries around the world in 2020, the amount that Bitcoin mining consumes every year is between the electricity consumption of Sweden and Malaysia. As the number of bitcoins gets closer to its theoretical maximum, the energy consumption to generate a new bitcoin will also grow geometrically. Another problem with Bitcoin is its dramatic price fluctuations. The prerequisite for a currency to be recognized by the market is stable, and the price of bitcoin has fluctuated dramatically since its creation, fluctuating by 10% or even 30% a day, causing it to become an outright speculative product.

4 Regulatory Measures of Virtual Currency

The problems of virtual currency have caused much negative influence, it is necessary to regulate virtual currency. Overall, there are two kinds of regulatory measures, market operation mechanism of virtual currency and legal regulation of virtual currency.

4.1 Improve the Market Operation Mechanism of Virtual Currency

Virtual currency has its convenience and stability, so the transaction rights and interests of financial consumers in virtual currency should be guaranteed. From the perspective of virtual currency trading institutions, the government should request virtual currency trading institutions to register with relevant government financial departments. For example, in Japan, according to article 9 of the Cabinet Decree on Virtual Currency Exchange Providers, the Japanese government requires that virtual currency trading institutions submit written materials to register in relevant departments. It should include the company's personnel, finance, name, and summary of the virtual currency operated, etc. Specifically, it includes the company's business name and residence, amount of registered capital, address, name of business place, name of senior executives, name of virtual currency operated, content, and method of virtual currency transaction. The reason for documenting these institutions through such detailed materials is that virtual currencies are constantly created and changed. The detailed recording of the information of virtual currency trading institutions can help the regulatory authorities to examine whether the products of the trading institutions belong to virtual currencies, whether the institutions

are suitable to operate virtual currencies, and whether the institutions have potential illegal behaviors, to ensure that only qualified trading institutions can enter the market.

For institutions that are suitable for virtual currency trading, the relevant government financial departments should issue licenses, just like food business licenses, so that consumers can judge whether these institutions are legitimate trading institutions. It can be divided into two types of business licenses; the one is the license required to pay or transfer money with virtual currency. In this way, the buyer can transfer his virtual currency to the seller's account through the virtual currency trading institutions, which is more time-saving and convenient than bank transfer. Another is the virtual currency credit trading license. The trading institution holding this license can provide the service of 'coin financing', which allows financial investors to invest in virtual currency just like buying and selling stocks. Investors only need to pay a certain margin or a certain amount of virtual currency to the institution. Qualification licenses issued by government departments can limit the scope of business of virtual currency issuers and restrict some risky business activities. In addition, virtual currency trading institutions are obliged to confirm the identity of customers and report to relevant government departments; they also should trace every transaction as far as possible. This article believes that this method can effectively prevent virtual currency from being used for money laundering and other illegal activities.

4.2 Appropriate Legal Regulation of Virtual Currency

Nowadays, the Chinese government denies the functions of virtual currency and prohibits all transactions of virtual currency on the Chinese mainland. This article thinks that this government measure is unreasonable. The development trend of virtual currency has already been irreversible, government should enact proper laws and policies to regulate virtual currency rather than negate it. In terms of private law, the government should protect investors' equity. Virtual currency can be regarded as a tradable and investable asset although it is not an entity. Government should acknowledge the legal status of virtual currency and protect the legitimate equity of virtual currency holders. Specifically, virtual currency is in the form of code, so the secret keys of virtual currency holders should be protected as a form of data. Whether people like to admit it or not, virtual currencies have become a popular investment product for investors. Many rich people around the world love virtual currencies, including Elon Reeve Musk, the founder of Tesla. France and Japan have set up their investor regimes. They allow some eligible ICO (Initial Coin Offering) to be issued in public after announcing their transparency, security of investment funds, and anti-money laundering.

Financial consumers are easily jeopardized by financial criminals because virtual currency has anonymity and speculativeness. Some country central banks enact relevant laws or regulations to protect virtual currency financial consumers. In simple terms, for instance, before consumers make any investment decisions, they will issue questionnaires to evaluate whether consumers are fully aware of the profits and risks of the virtual currency which they want to buy and check whether the seller has provided accurate information about himself or his plans.

From the perspective of anti-money laundering regulation, relevant laws should strict. Organization for Economic Co-operation and Development (OECD) adopted the Financial Action Task Force Standard amendment in October 2018. Some national institutions require exchanges and digital currency providers to obey and implement Anti-money Laundering/Know Your Customer (KYC) supervisory measures and they have to be monitored by national agencies. Apart from these, it is important to develop international cooperation. The transaction of virtual currency is usually multinational, so different countries should have universal and coordinating laws in a way.

4.3 CBDC, A New Idea to Regulate Virtual Currency

The Bahamas, Cambodia, and China are among the top three central banks in the world in terms of the maturity of their digital currency projects, according to a Pricewaterhouse Coopers (PWC) survey. Although China has issued its digital currency, it is still in the pilot stage and has not been fully rolled out. Digital currency is a kind of virtual currency issued by the central bank of a country. It can be called Central Bank Digital Currency (CBDC). The technology it uses is also blockchain technology like virtual currency. CBDC will have a positive impact on the government's supervision of virtual currency. Governments can control the issuance of digital currencies in the same way that central banks control the issuance of physical fiat currencies. The government should also actively promote the use of digital money by its citizens, and let the central bank's digital money replace the various virtual currencies in the market that are difficult to regulate. It not only helps to regulate the financial market but also helps to improve the security of people's payments and protect people's financial assets. Although the use of digital currency in various countries is still in the pilot stage, the feedback from relevant authorities in some countries, such as the Ministry of Finance of China, shows that the pilot operation of digital currency is very successful. This paper argues that the implementation of digital currency provides a new idea for virtual currency regulation measures. In addition, it has other benefits, such as it helps to reduce the cost of fiat currency issuance and helping the government analyze the data on national economic development.

5 Conclusion

The virtual currency has become a commodity with currency attributes and asset attributes. The use of virtual currency in financial transactions and its position in the investment products of listed companies should not be ignored. The existing problems of virtual currency do exist, but they can be solved through improved regulatory measures rather than outright denial. The relevant departments of the state can regulate virtual currency from the two aspects of the market mechanism and legal system. The specific methods include auditing trading institutions and issuing licenses for virtual currency transactions, legally recognizing the legitimacy of virtual currency, protecting the keys held by virtual currency holders, etc. In addition, CBDC is a new way of supervision. This paper believes that virtual currency and CBDC will change the global market transaction mechanism in the future.

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