

Systematic Risk and Prevention of Digital Currency

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Digitalization is reshaping the economic activities of our entire society. With the emergence and crazy expansion of Bitcoin in 2008, unprecedented challenges to traditional currency concepts, theories, and operations came with arising of numerous types of digital currencies. Legal norms are crucial to the operation of financial markets. From the perspective of the legal centralism theory, the legal power to regulate financial markets comes from the country's financial management power. With the characteristics of variability, it shows response to changes brought by current financial innovation. In the era of the Fourth Industrial Revolution, neither the blockchain technology, Internet, algorithms, nor artificial intelligence technology, are still far from perfect; however, these technologies are precisely necessary for digital currencies. At present, the risks for technology and network cannot be completely avoided, which may even intensify with the enhancement of dynamic correlations.

Keywords: digital currency, systematic risk, liquidity risk, regulatory risk

Introduction

In recent years, with the comprehensive development of science and technology, especially the promotion of technologies such as blockchain and artificial intelligence, the combination of finance and technology has become more and more in-depth. This combination has made various products in the financial market more digitalization and intelligence. Lately, the General Secretary Xi Jinping emphasized: "We should take the blockchain as an important breakthrough for independent innovation of core technologies, and accelerate the development of blockchain technology and industrial innovation." Among above, digital currency is undoubtedly one of the important innovations of financial technology as well as the typical project for the deep integration of blockchain technology and finance. With Satoshi Nakamoto proposing the concept of Bitcoin in 2008, digital currency has grown rapidly in the past decade, with gradually enriched types. The emergency of new digital currencies has changed and influenced the current payment tools, such as stable coins, super-sovereign digital currencies, and central bank legal digital currencies. However, the existing digital currencies in the market are mixed, and brought impact on the traditional currency legal system with the characteristics including anonymous holders, diversified issuers, and decentralized blockchains.

After World War II, especially after the Bretton Woods Conference, a new currency system was established internationally, and the U.S. dollar gradually took the leading role in the international currency, whereas, the excessive borrowing of the U.S. dollar led to the over-inflation of the global financial industry, while the case of

hyperinflation was even more serious and common. The theory of this point of view is exactly the same as that of the monetary liberal school. Hayek mentioned that if the national central bank can be abolished and privately issued currency is allowed, then the best currency will naturally emerge in private competition (Marx, 1986). Looking back at the present, since the high-profile appearance of Libra, the existence of digital currency had been paid more attention in many countries. Their active discussion on the way of further development and landing of central bank digital currency is also a push power for regulatory studies on other non-official digital currencies.

Systematic Risk of Digital Currency

The source of “systematic risk” was first proposed by William F. Sharpe. He divided the risks in capital market into two parts: systemic and unsystematic. By analyzing their differences, he explained that the risks that cannot be weakened by “not putting eggs in the same basket” are systemic risk. After the financial crisis in 2008, systemic risk became the focus of theoretical and regulatory research. In April 2009, an international organization, the Financial Stability Board (FSB), was established to prevent the accumulation and outbreak of systemic risks via proactive macro-prudential supervision (Proctor, 2017). In the definition given by the IMF (International Monetary Fund), the financial systemic risk refers to the occurrence of some external shocks, which leads to the decline of people’s confidence in the financial system overall, resulting in some economic value losses. Meanwhile, the uncertainty in economic activities led to the decline of real economy. In other words, systemic risk usually causes a chain reaction or even collapse in the financial market. Accompanied by sharp fluctuations in financial market prices, the cost and difficulty of financing also increased.

It is necessary to “prevent the economic operation from slipping out of a reasonable range, and to prevent short-term shocks from turning into trend changes” (Skidelsky, 2019). And the need to resolutely hold the bottom line of no systemic financial risks has been repeatedly emphasized. It can be seen that the precaution of systemic risks has always been non-negligible. Notably, as a new type of currency that is constantly developing, digital currency is beyond the scope of traditional currency in terms of form and mode of operation, and may even affect the normal operation of the existing monetary system. The invention and proliferation of digital currency pose a number of risks and associated policy issues; the existing laws and regulations are also challenged on adequately and effectively addressing the risks brought by currencies. Therefore, the research and discussion on its hidden systemic risk is of great significance for dealing with digital currency competition of global central banks and making good use of financial regulatory technology. At the same time, problems like forbidding financial systemic risk, facing the challenge of super-sovereign currency, taking full advantage of monetary policy, and improving the efficiency of macro-prudential supervision will be provided with solutions (Kaufman, 2004). According to the types of digital currencies, different kinds of regulatory logic should be adopted, and regulatory technology can be used to handle system risks, applying the blockchain technology to government supervision, thereby establishing a new regulatory framework for digital currencies.

The technological revolution has brought many new things, as well as a situation with completely unpredictable consequences. The transmission of risks inside and outside the financial system has become more complex and disorderly. The accumulation until outbreak of systemic risks will largely affect the economy of the entire country even worldwide. The formulation and implementation of laws have always been to serve the needs of reality. Nobel Prize-winning economist Coase emphasized the important role of legal norms in the operation

of the market. The new characteristics of the newly developed things need to be explained and adjusted by law even more. Legal tools are used to regulate new risk points that may cause systemic risks, so as to reduce them from the legal perspective. As far as digital currency is concerned, on the one hand, laws can be used to guide its market issuance and transactions. On the other hand, laws can be used to contain and punish illegal behaviors that may cause systemic risks. However, financial law is often lagging behind, showing the features of crisis-type legislation and supervision. Legislation cannot keep up with the development of FinTech, which undoubtedly needs to be improved.

With the integration of technology and finance, various new models continue to appear. Digital currency is also one of the new products of financial technology development, with accelerated development in the context of the gradual maturity of new technologies such as blockchain technology (Herian, 2019). Systemic risk will increase with the development of financial technology for two main reasons. First, the connection between data of different subjects and the possibility of risk transmission are enhanced. Second, the threshold for employment has been lowered. In the past, digital currency can only be issued by nation but now private individuals also have this right. The increased number of practitioners has led to the expansion of the impact and spillover of risks, and induced systemic financial risks. Currently, the regulation to financial technology in the world's major economies has gradually shifted from short-term policies to curb the spread of the crisis to improving the financial regulatory legislative system. In this way, systemic risks can be controlled fundamentally to better protect financial consumers.

Systematic Risk Brought by Liquidity Risk of Digital Currency

After the global financial crisis sweeping the globe in 2008, the shortcomings of financial capital regulatory frameworks have been recognized by many countries, especially the significant loopholes in cross-border capital regulation. And the effectiveness of financial regulation has also been questioned. After that, the Basel Committee made a full reflection and summary, and issued a number of guidance documents on Liquidity risk supervision. Since then, consistent liquidity supervision standards had been applied internationally to better measure liquidity risk. This shows that the possibility of systematic risk caused by the failure to regulate liquidity risk is a consensus of the financial supervision session. From the angle of regulatory purposes, financial crisis is the most obvious form of systematic risk. After the financial crisis, many countries began to shift the regulatory policies to the governance of systematic risk. Like in the famous Basel Accord III, one of the most important contents is the regulatory indicators on bank capital liquidity. The significance of liquidity risk management is self-evident.

Because there are various risks in the market, and the transmission mode and impact effect of different risks are also diverse, once the chain reaction is formed, it is easy to result in large-scale systematic risk. Several problems existing in non-sovereign digital currencies imply relatively large liquidity risk, which is accumulating continuously with the growth of time and types. In the meantime, liquidity risk is a type of multi-dimensional risk. With the continuous expansion of its use scenarios and the coverage of the applicable population, the radiation range will also increase, and lead to more serious consequences. The most representative global financial crisis is the one that happened in 2008, when the lack of liquidity of bank funds directly led to its outbreak. With the further deterioration of the Subprime Mortgage Crisis in the United States, depositors

panicked and rushed to bank runs. The liquidity among banks tightened rapidly and caused a chain reaction and triggered systematic risk. Hence, there are lessons drawn in the conduction from liquidity risk to systematic risk.

Nowadays, the market for non-sovereign digital currencies is gradually expanding. Although digital currency trading was once prohibited, PayPal has announced its entry into the digital currency market, and its users are able to use digital currency for shopping soon. Although orders will still be settled in US dollars, merchants will not accept payments in the form of digital currency for the time being; but it has already demonstrated that this international trade payment tool will become one of the platforms for digital currency exchanges. As the largest online payment system in the world, this behavior undoubtedly provides a huge flow of non-sovereign digital currencies. Once liquidity problems occur, the probability of systematic risk will increase.

Today there is a trend of diversification in the current types of non-sovereign digital currencies. With new digital currencies emerging every day, the number of involved industries and fields is increasing gradually, and their buyers spreading globally. Once liquidity issues arise, risk outbreaks will present as a network structure, with problems occurring in multiple places at the same time. And this structure will further change with the impact of risks.

There is another problem often being ignored. With the application of artificial intelligence technology in financial institutions, their algorithms and other technical mechanisms tend to be homogeneous in development. The actions generated in response to problems are generally the optimal solutions under artificial intelligence computing, which is easy to cause fallacy of composition. This will further lead to the spread of risks in the financial system, which is sudden and hard to stop. Meanwhile, non-bank financial institutions have the problem of weak risk resistance and are highly susceptible to the impact of risk transmission. Due to the low transaction costs and other factors of non-sovereign digital currencies, people's risk appetite has been further enhanced, resulting in more serious systematic risk aggregation.

Systematic Risk Brought by the Regulatory Risk of Digital Currency

For traditional finance, technological risks may only cause losses to a certain portion of the corresponding business. But the current financial system is different from the past. Connections between various parts have been increasingly strengthened by technology, thus technological risks become a fatal and global risk. For both the financial technology products like digital currencies discussed in this article, or the technologies being relied like algorithms and blockchain technology, the risks of Internet are also included. Panic might be caused by the risks if not regulated in time, leading to the failure of the financial system's self-regulation, finally resulting in systematic risk.

Currently, most digital currencies highly rely on technologies such as blockchain and algorithms. The limitation of traditional time and space has been broken by development of various technologies, but the improved efficiency inevitably carries the risk of technological failure. Traditional payment infrastructure has also undergone significant changes, and traditional regulatory frameworks also need to be changed accordingly. Based on the 2019 Hype Cycle for Emerging Technologies released by the information technology research and analysis company Gartner, technologies such as artificial intelligence and blockchain are still not mature and are in the "expected expansion period". With the expansion scale of digital currency and the increase of transaction frequency, simple underlying technology failure may make the risk spread faster and cause systematic risk.

For digital currency, computers and the Internet are indispensable foundations that play the role of linking various entities, and integrating enterprises and markets. Its certain public attributes are helpful in reducing negative externality but also bring other risks (Yao, 2018). Tether's Treasury wallet was hacked in 2017, which caused over \$30 million USDT to be stolen, and a complete decline in USDT prices. Any problem in the whole process of information processing, transmission, and application of digital currency will lead to complex consequences and even an overall crisis. Once the computer execution program is wrong, or there are some technical loopholes, the Internet will be impacted. Considering the exponential growth of the overall volume of information, the originally controllable technical risks will be rapidly amplified, contributing to systematic risk.

Since the advent of Bitcoin, various types of digital currencies have emerged one after another. Multiple new digital currency projects may appear in a single day, now its total number in the market has reached tens of thousands. To some extent, the public's demand for digital currency has also promoted the self-iteration of the financial market. At the same time, the digital currency is also constantly undergoing technological iteration. Stablecoins anchoring various assets have emerged, with even the super sovereign stablecoin, and the innovation cycle has been significantly shortened compared with previous financial products. In the context of accelerated technology iteration, diverse derivatives appear faster. As a result, the risk is more hidden, and the transmission speed is faster. Once it's out of control, systematic risk is more likely to occur. Meanwhile, the financial system tends to be automated, and automated decision-making may lead to the superposition effect of incorrect decisions, inducing negative impacts.

According to the prediction of the World Economic Forum, by 2027, 10% of global GDP will be stored on blockchain, demonstrating the enormous development potential of blockchain. When the Libra project was just announced, the European Commission began to investigate its "potential anti-competitive practices", which immediately attracted international attention. Such behavior became a catalyst to expose its underlying technology, that is, the technology monopoly risk of the blockchain. In the era of digital economy, platforms, data, and algorithms have formed a three-dimensional competitive market structure, breaking the boundaries between traditional market and regions. The external form of market competition was emerged, which drew great attention from international competition legal practice. The release of digital currency depends on platforms, data, and algorithms. The superiority of platforms are their competitive advantages in the market, which bundle economic activities on commercial and social platforms with users through digital currency. In the Libra 2.0 white paper, it is further stated that Libra uses the platform as arena, and multiple currencies can be handled in a single platform. It is evident that Facebook is more committed to establishing the platform in order to gain greater understanding on their regulations.

Digital currency more or less benefits from the network effect, and business model is also the reason and channel for its growth. Taking a radical business model to seize market share is one of the important development routes for stablecoins, issuers may even provide services with loss to gain market dominance. Nevertheless, excessive risks will bring additional risks to the financial market. As a digital currency issued by the Association, the agreement consensus used in Libra's blockchain breeds the technical risk of collusion, and the act of selecting members of the association may constitute anti-competition. With its scale expansion, this anti-competition risk will become more serious, and even implies the danger of market failure. Further consideration is needed on how to balance private interests and public interests.

Suggestions on Regulation of Digital Currency Systematic Risk

The competition for global digital currencies is in full swing, but the governance is still in infancy. China should not only seize the opportunity of upgrading the core technology of digital currency, but also pay attention to the early regulation of its systemic risks. It's necessary to improve the top-level design of relevant regulatory mechanisms, formulate specific regulatory mechanisms, control methods, and control agencies. Cooperative supervision, cross-border cooperative supervision, and other methods should be applied. The attention on design of regulatory measures can be flexible with the development of digital currency, as long as the bottom line of no systemic financial risks is kept.

First, execute hierarchical supervision to achieve controllable anonymity. With the development of digital currencies, their types, features, and associated assets are becoming more and more different. If the same regulatory system is used to regulate, it may not be suitable for future growth. Therefore, a hierarchical regulatory system can be established according to its characteristics to realize detailed supervision and better regulation of risks, for example, whether it is anchored to legal tender and other assets, whether it is 1:1 anchored, etc. If certain conditions are met, different levels of regulatory requirements will be triggered. In the meantime, the anonymity of digital currency must be controlled in a degree. The identity information of a person who owns compliant digital currency cannot be completely anonymous, so as to combat illegal activities using digital currency.

Second, change the regulatory model in response to systematic risk. Take its progress as direction to strengthen the construction of financial market infrastructure in the new era. In a broad sense, the soundness of financial laws is also part of the financial market infrastructure. In order to prevent the dilemma of regulatory legislation and effectively avoid the characteristics of legal hysteresis, the regulatory sandbox is still a kind of method worth learning. It can be applied to the issuance of digital currency, so that the risk points can be detected in time before the official issuance, to prevent blockages timely and maintain the order of the financial market.

Third, encourage experimental legislation to promote industry exploration. It is necessary to make full use of the industry in the regulatory system, change the status always in the "last source of law", and pay attention to the relevant explorations of the issuers and the industry. Especially the remedial methods and rules in terms of technical risks, the explorations are more realistic operability, and also more in line with the actual development needs of digital currency. At the same time, the industry will be encouraged to develop compliant stablecoins anchored to RMB, to get more bargaining chips for its internationalization.

Fourth, integrate regulatory technology and explore the coding of regulatory rules. With the widespread use of technology in the financial market, its application in the regulatory mechanism is the general trend and a practical need. The combination of technology with supervision can shorten the response time of supervision, realize the transformation from post-event regulation to pre-event and in-event regulation, and prevent the superposition of wrong decisions from causing more serious risk accumulation, simultaneously, setting up a special agency to resolve disputes related to digital currency, and establishing a consumer complaint information database to better protect the rights and interests of investors.

In addition to the above regulatory recommendations, the role played by sovereign digital currency is also of great concern. It not only relies on new technologies such as blockchain and artificial intelligence, but also with a corresponding complete regulatory background that determines its great importance in financial markets.

Based on this, China's DCEP should be provided with a complete legal supporting system to remove legal obstacles for it, so that it can become an important part of the new financial infrastructure.

In general, for the developing digital currency, we should take a prudent attitude, neither too loose nor too strict, and establish a compliance ecosystem suitable for its growth. Meanwhile, we should pay attention to the possibility of bringing systemic risk, and use new legislative ideas and means to continuously evaluate systemic risk and effectively regulate it. Only if the rights and interests of financial consumers are well protected, the bottom line of systemic risk is held.

References

- Herian, R. (2019). *Criticizing the blockchain*. (Y. C. Wang, Trans.). Shanghai: Shanghai People's Publishing House.
- Kaufman. (2004). *Philosophy of law*. (X. Y. Liu et al., Trans.). Beijing: Law Press.
- Marx. (1986). *Das Kapital* (Vol. I). (Compilation and Translation Bureau of the CPC Central Committee, Trans.). Beijing: People's Publishing House.
- Proctor, R. (2017). *Mann's theory of monetary law*. (H. C. Guo, Trans.). Beijing: Law Press.
- Skidelsky, R. (2003). *The biography of Keynes*. (L. X. Xiang & L. Chu, Trans.). Beijing: Xinzhi Sanlian Bookstore Press.
- Yao, Q. (2018). The evolution logic of currency under consensus rules and the artificial intelligence issuance of legal digital currency. *Financial Research*, No. 9.