

The Digital Yen: Developments, Opportunities and Challenges

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Abstract: With the rapid development of digital technology, the issuance of digital currency in Japan has emerged as an inevitable trend of the times. This paper comprehensively integrates the existing literature concerning the development, conceptualization, and motivation of the digital yen. It delves into the opportunities and challenges that will be encountered during its testing and issuance phases. Through in-depth analysis, it formulates policy recommendations to effectively prevent financial risks. It is concluded that Japan should steadily progress with the issuance of the central bank's digital currency while actively implementing measures to mitigate financial risks. By meticulously reviewing the historical evolution of the digital yen, we can gain a more multi-faceted understanding of the connotations and extensions of digital currencies. This, in turn, can offer valuable and appropriate references for countries across the globe that are either currently using or planning to adopt digital currencies, facilitating their informed decision-making and promoting the healthy development of the global digital currency landscape.

Keywords: Digital yen, financial risk, global monetary system, personal privacy.

1. Introduction

In today's era of digital wave sweeping the world, countries have launched research on the development of digital currency. As one of its components, the digital yen plays an important role in the global digital currency system. The development of the digital yen is not only related to the financial stability and economic development of Japan, but also occupies an important position in the global digital currency competition pattern.

With the rapid development of blockchain, cloud computing and other technologies, the traditional monetary system is facing many challenges and opportunities in the process of transformation. On the one hand, the use of cash gradually shows inconvenience in some scenarios, and the transaction efficiency needs to be improved; On the other hand, the testing and research and development of electronic payment technology faces financial risks, security risks and regulatory problems. In recent years, the Japanese government and central bank have attached great importance to the research and development of the digital yen, and have invested large costs in policy formulation, resource investment, and research and experiment, striving to make breakthroughs in guaranteeing currency stability, promoting financial inclusion, and improving payment convenience.

The number of studies on digital yen in domestic and foreign literature is relatively small in the whole digital currency system, and there is still a certain gap in the relevant literature review. By

reviewing and combining the development history of digital yen, this paper helps to understand the nature and future development trend of digital currency based on digital yen, and provides corresponding reference for the development of countries that are or will use digital currency in the world. The digital yen is expected to become a key driver of innovation in Japan's financial system, adding new vitality to the diversified development of the international monetary system with its unique advantages, and driving the economy towards a more efficient and convenient digital future.

2. Development history, basic concepts and definition of the digital yen

In recent years, with the development of digital payment technology and the rise of private digital currency, most countries have carried out relevant research on central bank digital currency (hereinafter referred to as "Central bank digital currency", CBDC) and in-depth research on the establishment of mathematical models and put it into pilot projects. And recognize the potential impact of central bank digital currencies on the international monetary system and the important role they play in monetary change. According to the findings of the Bank for International Settlements (BIS), the proportion of countries around the world studying central bank digital currencies has reached 94%, and more than half of central banks are carrying out pilot projects. It can be seen that the issuance of CBDC has become a trend in the current era [1]. As one of the most active countries in the world in the trading and use of digital currencies, the Japanese government maintains an open and inclusive attitude towards crypto assets, supports the conduct of corresponding trading activities and supports them, and makes a non-negligible contribution to crypto assets becoming a legal payment method. Data shows that Japan once became the world's largest bitcoin trading market in 2017 [2].

Combining the relevant literature in chronological order, it is not difficult to find that the country's attitude towards digital yen has changed, and a large number of voices of approval have gradually overshadowed the initial reasons for opposition, and the recognition degree has gradually increased. In the early days, the Bank of Japan was concerned about the potential application of digital currency technology in the wholesale business of the central bank, and since 2016, it has collaborated with the European Central Bank to conduct research in this area, but there are still concerns about developing a CBDC for the public. However, it has not hindered the conduct of relevant studies. Since 2019, the Japanese government has started to have literature studies on the financial risk prevention and control and supervision of stablecoins and gradually deepened them [3]. In the medium term, the 2020 Central Bank Digital Currencies: Foundational Principles and Core Features clearly endow CBDC issuance with sound legal attributes, making it move toward legalization, and stipulating that the central bank, as the holder and issuer of CBDC, has the right to support the investment of digital currency into the financial field; The general trend of development in recent years shows that the stance and attitude of central banks in some countries have accelerated the change of CBDC. It can be seen from official documents or semi-official reports released by the Federal Reserve, the European Central Bank and other central banks that the European and American central banks pay almost exponential attention to CBDC, and the relevant legislation and design have risen to the level of national legislation or administrative deliberations, and are developing and improving towards standardization, institutionalization and systematization [4]. At this stage, Japan, as the first country in the world to introduce stablecoin regulations, incorporated stablecoins into the existing financial system in June 2022 [3]. In April of the following year, the Bank of Japan decided to launch a pilot project to issue digital yen. [4] It attempts to verify the feasibility of deposits and withdrawals over a two-year period as a reference index for deciding whether the digital yen will be issued in 2026. It can be inferred that there is a certain probability that Japan will introduce digital yen in the near future. Although Japan is cautious about the release of CBDC, it has made some achievements in the evaluation of the motivation, basic type, operation mechanism and simulation effect and will continue to deepen.

The digital yen adopts the model of "top-level design and two-tier operation", allowing cryptocurrency trading and absorbing private forces to build a diversified governance system. The digital yen, with M0 as its orientation, will coexist with the real currency for a long time [5]. According to the composition of the basket of currencies of the International Monetary Fund (SDR), the multi-polarity of the world's currencies consists of the US dollar, the euro, the Japanese yen and the Chinese yuan, of which the Japanese yen accounts for a relatively low (7.59%). But the yen remains an important reserve currency after the United States and the euro. Since 2022, due to the divergence of monetary policies between the Bank of Japan and some central banks in Europe and the United States and other factors, Japan's economic recovery has suffered setbacks, and the yen is facing the danger of continued depreciation. Japan's attempt to unite the hegemony of the US dollar to suppress the development of its rival digital yuan [6]. Digital yen, both retail and wholesale, is in the verification and testing stage, and has become the Bank of Japan's Digital Currency Research Institute in terms of legislation and supervision, and has issued corresponding reports to solve existing problems [7].

3. Motivations and Opportunities for the Development of the Digital Yen

3.1. Technological innovation and the context of the digital age

With the continuous advancement of the digitization process, the rise of emerging technologies such as blockchain provides technical support for the digital yen. These technologies have the characteristics of decentralization, immutability, security and efficiency, which can ensure the security and reliability of digital currencies in the transaction process. At the same time, technological innovation also makes the issuance and circulation of money more convenient and efficient. Under the background of digital era, the development of digital yen also has urgent practical needs. With the acceleration of the global digitization process, people's life and consumption patterns are becoming more and more digital. The rise of new consumption models such as electronic payment and online shopping makes traditional currency not convenient enough in some scenarios. Since 2020, with the global central banks attaching great importance to CBDC and the opening of the discussion process, the Bank of Japan has also joined them and actively promoted the sorting out of the problems faced by the issuance of digital currency and the exploration of opportunities [8]. On the one hand, driven by technological innovation, CBDC can accelerate the continuous iteration and upgrading of its functions, making it a more efficient transaction payment tool than paper money under the monetary role of inheriting all the functions of paper money. On the other hand, digital intelligence technology has a powerful enabling effect on the development of CBDC, transforming CBDC into a new tool with dual functions of state perception and data acquisition, so as to achieve the goal of efficiently monitoring the economic trend. The specific implementation path is as follows: perceive all kinds of economic data changes in real time and transmit them to the digital currency management platform for analysis and synthesis. According to the economic status, the platform effectively allocates resources and directs money to places in urgent need [9].

3.2. The contribution of digital currencies to the demand for economic growth

The digital yen can improve payment efficiency in economic growth, reduce transaction costs, promote consumption and investment, and inject new vitality into economic activities. At the same time, the digital yen, relying on advanced technology, can promote financial innovation and expand the breadth and depth of financial services. In the wave of global digitization, the digital yen enhances Japan's economic competitiveness by attracting international investment and trade cooperation. In addition, it enhances the effectiveness of financial regulation, reduces financial risks, and provides a guarantee for stable economic growth. In short, the digital yen is expected to become a new driving

force for Japan's economic growth. The issuance of digital yen provides strong support for solving the interoperability problems of various payment platforms, and can improve the stability and efficiency of the entire payment and settlement system; the establishment of a new currency system under the digital era in line with the new trend of technological development is also the key to provide timely support for the future surge in demand for the digital economy [10]. The digital yen can effectively improve the robustness and integration of the mobile payment system. As a country prone to natural disasters, power outages can cause inconvenience in mobile payments, and CBDC can realize offline payments; break down the barrier between commercial bank payment services, and set a more unified standard based on CBDC, which helps to improve the degree of integration of payments; the use of DLT technology makes the digital yen a carrier for prepaid cards and other devices with storage functions, which is convenient for use by the elderly and children, promotes financial inclusion [10], and promotes financial inclusion [9].

3.3. Great power games (economics)

In addition to responding to global governance in the field of private digital currencies, Japan actively promotes consensus cooperation among the group of developed countries in the field of CBDC, which is in sharp contrast to its cautious attitude towards CBDC at home, reflecting its intention to maintain national economic security with the help of external forces. In the context of the great power game, Japan's issuance of digital currency has multiple reasons. On the one hand, with the continuous change of the global economic pattern, countries in the financial field of competition is increasingly fierce. Japan realizes that the issuance of digital currency can enhance its status and voice in the international financial system and not be passive in the great power game. By actively participating in the cooperation on CBDC among the group of developed countries, Japan is able to keep pace with international financial innovations and work with other developed countries to formulate rules and standards, thus playing a greater role in global financial governance. On the other hand, the development of digital currencies may reshape the global trade and payment landscape. Japan, as a country highly dependent on international trade, hopes to optimize trade settlement methods, reduce transaction costs, improve trade efficiency and enhance its competitiveness in international trade through the issuance of digital currencies. At the same time, the field of digital currency is a key battleground in the technological competition among major countries. Japan expects to promote the development of its own financial technology and enhance the country's overall scientific and technological strength to meet the challenges from other major countries through active exploration in digital currency. In addition, the regulation of digital currencies is still imperfect globally, and by cooperating with other countries, Japan can jointly explore an effective regulatory model to prevent financial risks and ensure national economic security [11].

4. Challenges of Digital Yen Distribution

First, the role sharing between CBDC and private digital currency is not clear and is in a vague area. The security, regional differentiation and function setting of private digital currency are still in the initial stage. There is still a research gap in data management and responsibility sharing between the Bank of Japan and private payment institutions. In addition, the liquidity crisis of the financial system caused by the "short deposit and long loan" mode of commercial banks is also a major challenge in the development process. One of the important goals of designing CBDC is to reduce the occurrence of financial crises, and efforts should be made to solve the compatibility between efficiency, personal privacy security and overall financial stability.

Second, under the influence of long-term payment habits, despite the increasing diversification of means of payment, Japanese citizens still use a lot of cash, and the institutional settlement

infrastructure is difficult to play its role under the low currency circulation. In the process of putting digital yen into the pilot, the protection of personal privacy and the encryption of data have received attention. How to adopt technology to achieve a win-win situation between privacy protection, anti-money laundering and tax evasion, and how to grasp the scale and standards of user information disclosure still need the Bank of Japan and related financial institutions to improve the rules and standards [12]

5. Policy recommendations and financial risk prevention

First, steadily promote the issuance of central bank digital currency. The testing and issuance of the central bank's digital currency requires the support of relevant technologies and the guidance of innovative ideas, and steadily promoting its development requires the construction of solid infrastructure and the cultivation of innovative thinking. These preparations serve as key tasks to lay a solid foundation for the subsequent research and development process and create a broad development space for the application of digital yen. At the same time, the assessment and prevention of financial risks in the early stage, the efforts to reduce the potential risks caused by the issuance of central bank digital currency and the creation of a relatively loose credit environment are also conducive to the stable development of the financial system, enhance the Japanese people's sense of trust and confidence in financial intermediaries, and promote various work in a stable and orderly manner in the whole process. Regarding the disclosure scale and standard of user information, it is necessary to balance anonymity and compliance, such as adopting small amount of anonymity and large amount of real name, and severely punishing anti-money laundering, tax evasion and other acts [11].

Second, in-depth study of the application of central bank digital currencies at the monetary policy level. The interest rate of the central bank digital currency can be used as an important monetary policy tool, which is also an innovation. Changes in this interest rate can directly affect the deposit interest rate of commercial banks, which in turn will have an effect on bank deposits, loans, and lending rates. Reasonable setting of the central bank's digital currency interest rate can achieve the purpose of supporting the macro-economy, and this policy innovation can enrich the central bank's existing reserve of tools. Existing research shows that this policy tool can enhance the effectiveness of monetary policy transmission. The introduction of central bank digital currency can ease consumers' liquidity constraints and effectively reduce transaction friction, which is beneficial to consumers. As a new retail electronic payment tool, the use of central bank digital currency not only improves payment efficiency, but also encourages consumption and increases output, which has a positive impact on the domestic economy.

Third, it promotes the reform of monetary policy to keep pace with the times. Monetary policy, as an important means of national macroeconomic regulation and control, must keep abreast of the times to adapt to the changes brought about by the development of digital currencies and to ensure the sound operation of the macroeconomy. Monetary policy, as a derivative of legal tender bills freed from their natural attributes during the industrial economic era, has always provided strong support in the stable development of the economy through the central bank's reasonable control of the money supply. CBDC also requires a digital intelligent platform for management, and as a whole, the central bank should have an in-depth understanding of the AI technology and future development trend of digital currencies, and formulate the corresponding regulatory policies to ensure the safe and stable operation of CBDC. Secondly, it should improve the monetary policy tools and transmission mechanism, adjust the monetary policy tools according to the development of digital currencies, and improve the effectiveness and precision of monetary policy. Specifically, it can start from the structural reform of the financial supply side, such as setting up a payment and settlement, market access and risk management system dedicated to CBDC, empowering it through blockchain, big data and other

technologies, and timely adjusting the issuance volume and the market access system through information processing and in-depth analysis of the data information of the currency transaction, so as to ensure the standardized operation of the financial system and constantly review the effectiveness and applicability of monetary policy tools [13].

6. Conclusion

By analyzing the development, concept definition and motivation of the digital yen, exploring the opportunities and challenges it will face in the process of its testing and issuance, and giving policy recommendations for preventing financial risks, it can be seen that the digital yen is currently in the stage of active exploration and development. The Japanese government and central bank are vigorously investing in research and development, technical testing and program design, not only to explore the advantages of the digital yen to adapt to the transaction needs of the digital era, to provide new space for the development of fintech enterprises, but also need to strengthen the country's regulation of currency circulation. Combined with the specific conditions of Japan, it is also necessary to deal with the challenge of public acceptance when changing traditional payment habits, and to deal with the potential impact of digital currencies in other countries on the digital yen in the face of fierce international competition. Overall, the development of the digital yen presents both opportunities and challenges, and requires careful advancement and continuous improvement. By organizing the history of the development of the digital yen and studying the current situation, it provides a new perspective for the Bank of Japan's policymaking, aiming to promote global economic development and financial stability and to adapt to the needs of the digital era.

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