The impact of central bank digital currency issuance on the international monetary system - taking China and other countries as examples

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Abstract. As the current international monetary system is increasingly unstable and unbalanced, even more countries have begun to study and implement digital currency and put forward the concept of super-sovereign currency. The inherent defects of the international monetary system dominated by the US dollar provide space for the generation and development of super-sovereign digital currencies. Based on the superficial reasons for the issuance of decentralized digital currencies by various countries and the current policy situation, this paper proposes the impact of future super-sovereign digital currencies on the international monetary system. Taking the issuance of digital currencies by the People's Bank of China as the starting point, this paper combines the data of the Federal Reserve and the Bureau of Economic Analysis from general to special. It is concluded that the super-sovereign digital currency may fundamentally reshape the international monetary system and the pattern of international trade. Developing countries, such as China, may hold the upper hand of the upcoming changes in the international monetary system by promoting the internationalization of the digital yuan with its leading position in the field of central bank digital currency and its important position in world trade.

1 Introduction

In recent years, as the current international monetary system is increasingly unstable and unbalanced, even more countries have begun to study and implement digital currency and put forward the concept of super-sovereign currency. The inherent shortcomings of the USD-dominated international monetary system provide space for the generation and development of super-sovereign digital currencies [1]. More and more countries and scholars believe that building a new international monetary system by adopting super-sovereign currency can solve various problems caused by the current international balance of payments imbalance and other problems caused by a single sovereign currency as part of international reserves. Therefore, digital technology is integrated into the research of super-sovereign currency to create a super-sovereign digital currency. This will have a subversive impact on the international monetary system and national monetary policies. Based on the superficial reasons and policy status of countries issuing digital currency, this paper puts forward the impact of digital currency on the international monetary system. Taking the issue of digital currency by the People's Bank of China as a starting point, from general to special, this paper analyzes the deep reasons and impact of the emergence of digital currency and its possible development into super-sovereign currency. Find out the countermeasures of developing countries in the face of opportunities and crises in the development of digital currency and the reform of the international monetary system.

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2 Shallow motivations and status quo of issuing digital currency in various countries

2.1 What is digital currency and why do countries issue digital currency

First of all, we must understand what digital currency is, in order to specifically study the impact of the People's Bank of China's issuance of digital currency and countermeasures. Digital currency can also be regarded as a virtual currency using node network technology and digital encryption algorithm [2]. As blockchain information technology provides support for digital currency, the use of digital currency can greatly reduce the cost of exchange production for enterprises, thereby improving production efficiency. Therefore, digital currencies have three core characteristics. First, because the digital currency comes from a public calculation, its release is not regulated by any person or organization. Second, because the number of calculated solutions is fixed, there will be no misuse of coins and inflation. Third, the transaction process needs to be authenticated by all network nodes, so the security is very high.

So why are countries issuing digital currencies? Countries have launched their own digital currencies, mainly because digital currencies have the characteristics of decentralization. The use and issuance of digital currency do not rely on the funds and credit guarantees of financial institutions, government departments, companies or organizations, but rely on computer technology, information computing, network protocols, etc., which theoretically proves that all individuals, organizations, and government departments can not control the amount of digital currency or cause artificial inflation. Therefore, the emergence of digital currency has a very big impact on the international monetary system. Under the floating exchange rate mechanism, the uncertainty of exchange rate increases the risk of trade, increases the difficulty of trade settlement, and restricts the development of trade in a certain sense. It is necessary to ensure the stability of exchange rate while fixing the exchange rate, which reduces the autonomy of domestic monetary policy and increases the possibility of inflation. However, the decentralized nature of digital currency can overcome the above problems, making the status of users of digital currency equal, as long as the link to the network can be free to trade without the approval of a third party. This is also the superficial reason why countries have issued digital currencies (see Fig. 1).

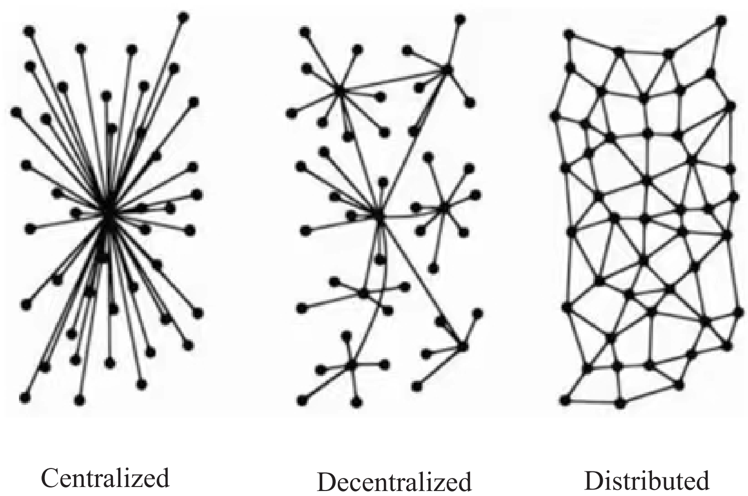

Fig. 1. Decentralized presentation diagram

2.2 The status quo of various national policies and the issuance of digital currency by China's central bank

In response to the huge impact of private digital currencies represented by Bitcoin, and the hope of gaining an advantage in the future currency field, digital currencies in various countries are continuing to develop and improve (see Table 1).

Table 1. Central bank digital currency research status

Country (region)	Exploration situation
America	In 2020, the chairman of the Federal Reserve said that the Fed was conducting research on a central bank digital currency but had not yet decided whether to launch it
China	The People's Bank of China set up a research group in 2014 to calculate the possibility and applicability of the bank issuing a statutory number China's central bank held a seminar in January 2016, and the results of the discussion were that the issuance of digital currency by the central bank should be implemented as soon as possible, which has an important impact on the development of China's economy Fan Yifei, deputy governor of the People's Bank of China, said in November 2019 that the central bank's legal digital currency has basically completed the standard formulation and top-level design
Singapore	Launched in November 2016 to investigate the use of distributed ledger technology in the digital currency space, the Ubin project is being promoted by the Monetary Authority of Singapore in collaboration with blockchain association R3
Canada	The Bank of Canada partnered with R3 to launch Project Jasper, a digital currency, in 2016 In 2019, the bank completed a test of cross-border payments through the central bank's digital currency
Russia	Russia will issue a crypto ruble as their official digital currency in 2017
The Philippines	The Central Bank of the Philippines has set up a study group in 2020 to study the feasibility of issuing a central bank digital currency and its implications for national politics

China's central bank has taken a decentralized approach to issuing digital currency. Endorses the digital currency with monetary credibility to prevent major changes in the value of commodities, thereby maintaining the value of digital currencies in the market and the stability of the financial system. In the input mode, a double-layer input mechanism is introduced to prevent interference with financial institutions. In the supervision setting, a multi-level anonymous control system is generally implemented to meet the dual requirements of legality and anonymity. In terms of monetary policy, the central bank's digital currency has perfected and enriched its transmission channels and improved the effectiveness of policies. In the area of supervision, central bank digital currencies can help achieve financial monitoring and reduce the risk of economic criminal activities. China's central bank digital currency can bring a more convenient way to understand finance. Banks have the ability to optimize the use scenario of digital currency customers and the ecological business chain to seize users, which potentially makes up for the limitations of commercial banks' financial service Settings, as well as the lack of financial outlets and other social difficulties. The digital currency issued by the central bank also has a higher credibility guarantee ability, which can further promote the global circulation of digital currency, play a positive role in promoting economic globalization.

3 The deep reasons and effects of the development of digital currency to super-sovereignty

3.1 The evolution of the international monetary system and the dominance of the US dollar

The international monetary system governs monetary relations among nations and thus becomes the practice of payments and transactions. During the two World Wars, currency blocs fought against each other and devalued, resulting in instability in the world economy. Until after World War II, after the US won the position of the capitalist world leader, the United Kingdom jointly proposed the White plan to promote international financial cooperation in a gradual way [3]. On this basis, the Bretton Woods System was established, which established unified norms and benchmarks for global monetary and financial relations, ensured the smooth operation of the monetary and financial fields and systems, enabled the economies of various countries to shift from external balance to internal balance, eliminated a large number of exchange rate fluctuations through the fixed exchange rate system, expanded world trade, and promoted the internationalization of production and capital.

Compared with the international monetary system of the past, the Bretton Woods system was a marked improvement. Because it established a permanent system of international financial institutions and the institutions needed for the management of modern national exchange rate systems, and included all capitalist countries in the international gold exchange standard system. However, due to the uneven development of the world and the "Triffin problem" faced by the dollar itself, the Bretton Woods system gradually collapsed due to its inherent shortcomings. Its successor, the Jamaican system, has been in a long-term malaise since its creation, with global monetary and financial crises. After the non-monetization of gold, the world's important reserve assets are sovereign credit currencies, which are often overissued, resulting in global liquidity flooding, which is also the fundamental reason.

In addition, the instability of the multi-currency reserve system coexisting with the yen, the dollar and the euro, the changes in the foreign exchange market caused by soft and hard currency factors, and the superposition or offset of the functions of the balance of payments mechanism have also had an adverse impact on the international flow of goods and capital, and exacerbated the global trade imbalance (see Fig. 2).

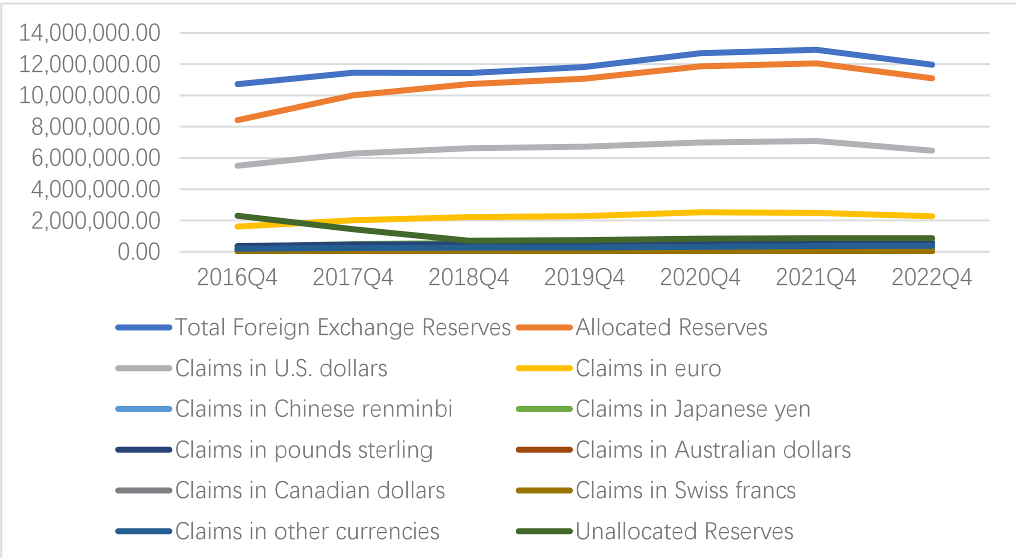

Fig. 2. Currency composition of world foreign exchange reserve allocation from 2016Q4 to 2022Q4

Under this system, developed countries can effectively exchange for the equilibrium of internal economic operation through the international floating exchange rate system, and in the process of independent adjustment of international balance of payments, they can also ensure the autonomy of their own currency prices. However, developing countries need to maintain their own internal equilibrium to maintain foreign equilibrium. If the balance of payments is unbalanced and cannot be adjusted, the autonomy of monetary policy will be greatly reduced. Circulation of the reigning dollar is even more unrestricted. The US dollar is the main reserve currency for many developed countries and the main settlement currency for global commodity trade. In the context of the long-term quantitative easing system in the United States, a large number of dollars were freely issued and then traded abroad.

Fig. 3, for example, highlights the impact of QE on the Fed's financial assets and profits. The Fed's financial assets have grown rapidly as a share of U.S. gross domestic product, based on the index used in 2001. In addition to QE, the Fed's lending market indicators also reflected cyclical changes in interest rates, which represented a cyclical peak in 2007. The index also gradually climbed along with QE and reached its all-time high in early 2022. It is this large-scale offshore dollar circulation abroad that has a huge impact on productive countries whose international trade is still in a low surplus stage.

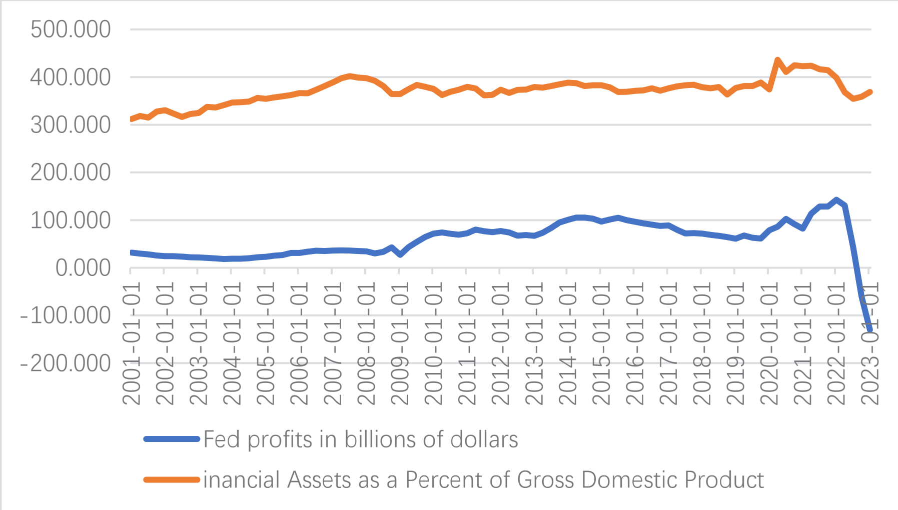

Fig. 3. Effects of quantitative easing 2001-2022 on the Fed's financial assets and profits

At the same time, as an indebted country, the Federal Reserve collects huge seigniorage by issuing dollars to the world. Between 1996 and 2010, for example, the US government ran a cumulative current account deficit of $6.98 trillion, while its net external debt increased by only $230 million. The United States government issued a large number of dollars of very low value in exchange for more resources and goods of real value, and took more seigniorage.

According to the analysis of the current situation, the world monetary system is dominated by developed countries, and their monetary policies will affect the macroeconomic policies of other countries, and may even have a negative effect, which also causes the asymmetry between currency issuing countries and other countries. Digital currencies release exchange messages through the Internet center, without setting up a special issuing authority, and all countries that adopt digital currencies freely exchange them according to their own needs, overcoming the asymmetry problem between banknote issuing countries and other countries at the technical level. Therefore, if the digital currency becomes an international currency, it can reduce exchange risks to a greater extent, promote free trade and financial market technological innovation, and maintain the balance of the currency value, so as to better complete the global exchange rate system objectives.

3.2 Exploration from general super-sovereign currency to super-sovereign digital currency

The birth of the euro in 1999 was a landmark event in the global monetary field. It first turned the concept of "super-sovereign money" in the modern sense into reality. At the same time, the development direction of the super-sovereign currency does not depend on gold, nor on a single country, becoming a typical example in the development process of the world currency [4]. Before the G20 meeting, Xiaochuan Zhou put forward a proposal to build a "super-sovereign reserve currency". He believes that a global reserve currency must be built that is decouple from the sovereign powers and can maintain a stable exchange rate in the medium to long term. The most critical new definition of the function of the super-sovereign currency is that it does not need monetary policy arrangements, and fundamentally breaks the monetary policy and monetary function positioning based on the national sovereign currency [5]. However, the quasi-international monetary system that is closest to the non-sovereign reserve international monetary system today, namely the IMF's Special Drawing Rights, still has great limitations, neither can it carry out the ordinary functions of traditional money, nor can it achieve monetary policy by means of conventional monetary tools, including adjustment of interest rates, open market operations, and discount interest rates Policy [6].

With the rapid advancement of Internet technology, as we see that the final form of digital currency is increasingly likely to compensate for the shortcomings of the Jamaican system and disrupt financial hegemony, various countries in the world are realizing that with the help of decentralized blockchain technology, we can bypass the SWIFT settlement system of the US dollar without the need for banks, so that national currencies have the opportunity to challenge and collapse the centrality of the dollar. In the future, the world will have the opportunity to create several super-sovereign digital currencies that are equal. However, the impact of super-sovereign digital currencies is not only the US dollar, but the fiat currencies of all countries. Central banks' efforts to study and issue digital currencies will reshape the international monetary system and may also promote the internationalization of some currencies in the future. This may restore the supremacy of money, or it may create a financial system far superior to commercial banks.

4 The response to the development of digital currency and the reform of the international monetary system

4.1 The impact of digital currencies on the transmission mechanism of monetary policy in various countries

At present, in the face of global economic stagnation and recession, governments of all countries use monetary policy and fiscal policy to reverse adjust, increase government expenditure, and transform the liabilities of social micro-entities into government liabilities under the circumstances of insufficient social demand, market liquidity depletion and economic recession. Although the stimulus economic policy widely adopted by all countries may ostensibly stimulate investment and consumption to drive economic growth in the short term, the expansionary monetary policy makes the distribution of social wealth more inclined to those enterprises and departments that can expand debts and increase investment and consumption accordingly, thereby rapidly and effectively driving economic growth. Some governments focus on economic growth while ignoring sustainable social and economic development, and adopt unlimited quantitative easing policies to stimulate short-term economic growth, but also invisibly deprive and transfer the wealth of those who hold monetary assets. Therefore, the neutrality of monetary policy is difficult to maintain, and the macro goal of currency stability is difficult to achieve. This also causes the problem of mismatch between the growth of social debt and monetary aggregates and the growth of social wealth. The sustainable development of the existing credit monetary system, which keeps the growth of social debt and monetary aggregates exceeding the growth of social wealth for a long time, obviously implies great risks and hidden dangers, and is an unsustainable development model. If it is not controlled and changed as soon as possible, countries will eventually suffer from the consequences [7]. Moreover, the consequences of this behavior have begun to emerge, the US dollar credit crisis, the European debt crisis, etc., are the direct consequences of these countries taking unlimited quantitative easing policies to stimulate the economy under the credit monetary system. Therefore, how to accurately and reasonably control the total amount of money in circulation and the supply of basic money is still a problem that monetary theory and credit monetary system need to solve. The birth of digital currency provides a solution to this problem.

There are many research perspectives on the effect of the issuance of digital currencies on the mechanisms for implementing and transmitting monetary policy. Some studies believe that "as a new monetary policy tool, central bank digital currency enhances the effectiveness of monetary policy and enhances the transmission efficiency of monetary policy". However, another explanation is that digital currencies contradict national monetary policies, that is, the paradox of monetary policy and decentralization. As the regulator of the national economy, the central bank regulates the money supply in various ways to achieve national development goals, which is contradictory to the mechanism of action of digital currency. The decentralization of digital currency requires no regulation by third-party institutions to achieve direct docking between users and users. In reality, this is not realistic. All countries cannot do without the central bank and monetary policy regulation, and the fiscal policy formulated by the government must also be implemented through the central bank. This leads to the paradox of "digital currency": the contradiction between national monetary policy and digital currency decentralization [8]. In fact, the digital yuan uses limited anonymity except for the central bank, and in order to ensure the controllability and regulation of the social economy, complete anonymity is not realistic. Some scholars also believe that the impact of digital currency on monetary policy is neutral, "DC/EP issuance, return link, the impact on the monetary system is neutral." In addition, if some deposits become DC/EP, there will be a certain monetary tightening effect, but the scale of the impact is small, and the central bank's policy is easy to hedge."

Taking digital RMB DC/EP as an example, at this stage, digital RMB is only an alternative to M0, and is only used in retail payment scenarios, with a relatively limited circulation and circulation range. The issuance of digital currency is still operated through the existing two-tier system of "central bank - commercial bank" and "issue database - business database", that is, the central bank issues digital RMB to commercial banks and reserves are withheld, and then commercial banks circulate digital RMB to the market through credit, discount, bond trading and other businesses. This two-tier operation mode of the dollar changes the current currency issuance and circulation system, and essentially only electronic the physical process of the base currency delivery, so the impact on the current monetary policy and its transmission mechanism is relatively limited in scope and extent.

4.2 The transformation and response of the international monetary system brought about by super-sovereign digital money.

At present, the digital currency issued by various countries still belongs to the category of sovereign currency, but the introduction of super-sovereign digital currency through the integration of digital technology and the concept of super-sovereign currency is the development trend of international currency in the future. Although the super-sovereign digital currency has no government credit guarantee, it can maintain low inflation and stable currency value through the built-in price stability mechanism, and develop towards the direction of global free circulation and intelligent diversification of application scenarios [9]. Since it does not require national credit endorsement, the super-sovereign digital currency can reasonably avoid financial regulation and reduce the cost of financial activities, which gives it a special advantage in transnational financial activities. However, the lack of national credit constraints is a double-edged sword, which brings great potential risks to the global circulation of super-sovereign digital currencies [9]. Ultra-sovereign digital currency is essentially a kind of financial innovation, which urgently needs synchronous innovation of financial supervision. Currently, the regulatory methods that can be adopted not only include the traditional establishment of full-time regulatory departments, the formulation of legal details to limit the scope of regulatory responsibilities, but also the continuous development of digital currency regulatory technology [10]. Strengthen information data management to protect the privacy of currency holders and accelerate the development of real-time payment system infrastructure.

5 Conclusion

In short, super-sovereign digital currencies may fundamentally restructure the global monetary system, such as impacting the status of sovereign currencies, reshaping the pattern of international currencies and international trade, and building a new financial system. In this process, developing countries, such as China, can rely on its leading position in the field of central bank digital currency and its important position in world trade to promote the internationalization of digital renminbi, so as to occupy an advantage in the upcoming reform of the international monetary system, carry out cross-border cooperation and coordination with countries, and promote the construction of a global governance system of super-sovereign digital currency.

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