

# *Analysis on the Optimization Path for the Application of Central Bank Digital Currencies in Cross Border Payment*

**Xiuping Zhai**

*Business School, University of Aberdeen, Aberdeen, AB24 3FX, UK*

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**Abstract:** In the era of great development and transformation in the digital economy, the Central Bank Digital Currency (CBDC) has received attention from various countries. Various countries have gradually increased their research and development efforts in CBDC, striving to explore more application directions of CBDC. Especially in the context of economic globalization, with the further increase in financial demand between different regions and countries, cross-border trade exchanges between countries have become increasingly close, and cross-border payments have become an important exploration direction for central bank digital currencies. Based on this, this paper first analyzes the advantages of CBDC application in cross-border payments, and provides a detailed analysis of the potential challenges of CBDC application in cross-border payments. Finally, the paper proposes practical and effective optimization paths for CBDC application in cross-border payments.

## **1. Introduction**

The global economy is becoming increasingly digitized, and various blockchain and distributed ledger technologies have also been greatly popularized and applied in the global market. In this context, central bank digital currencies have developed rapidly and gradually become the focus of attention for various countries. Compared with traditional private cryptocurrencies, central bank digital currencies are backed by national credit, have legal protection, and have high controllability and security. It not only has a serious impact on the current monetary system, but also poses a challenge to the traditional cross-border payment system in the current international economic market. So how to better apply central bank digital currency in the globalized cross-border payment and trade system has become the next research hotspot.

## **2. Analysis of the Advantages of Central Bank Digital Currency Application and Cross border Payment**

The application of central bank digital currency in cross-border payments has significant advantages. It not only effectively improves the efficiency of cross-border payments and promotes fair cross-border transactions, but also conforms to the current trend of countries' demand for central bank digital currency in the international environment.

## **2.1. Improving the Efficiency of Cross-Border Payment Operations**

The application of CBDC in cross-border payments can achieve the unity of security and efficiency, further improving the operational efficiency of cross-border payment. Compared to traditional cross-border payment models, the distributed ledger technology used by digital currencies can achieve peer-to-peer transmission mode, achieve fund traceability during the payment process, prevent transaction tampering, and greatly improve transaction security. In addition, the CBDC can complete cross-border payments within seconds, greatly reducing waiting time and improving the efficiency of cross-border payments. [1]

## **2.2. Beneficial for Shaping Fair Cross-Border Transactions**

Applying CBDC to cross-border payments can further shape a relatively fair cross-border payment system and create a fair cross-border trade transaction environment. Firstly, it should be recognized that applying CBDC to cross-border payments can reduce dependence on financial intermediaries, especially since the intermediary software systems used in certain cross-border payments are often monopolized by some developed countries. Applying central bank digital currency to cross-border payments can weaken the monopoly position of some countries or organizations in cross-border payments and provide a fair and open trading platform for more countries and regions. In addition, applying CBDC to cross-border payment processes can also promote further cooperation between central banks of various countries, and attract more economies to participate in the research and application of CBDC in cross-border payment systems. It is useful to strengthen communication and collaboration between different countries, form a fair and effective communication and dialogue mechanism, and reduce trade and friction in the cross-border payment process. Finally, it can shape a relatively fair cross-border payment and trade system.

## **2.3. The CBDC Has a Broader Development Environment**

The current international environment is relatively friendly to central bank digital currencies, which is one of the prominent advantages of CBDC application and cross-border payments. Compared to traditional currencies, CBDC has broader application prospects. Currently, many countries have begun to explore and deepen the application solutions of CBDC in the field of cross-border payments. For example, the G20 organization has proposed to further develop new cross-border payment technologies, improve the cross-border payment system, and provide convenience for CBDC's cross-border payment applications among G20 member countries. In addition, the BIS (Bank of International Settlements) Innovation Center is also exploring more utilization paths for CBDC through cooperation with multiple countries including China, Thailand, Malay, and the United Arab Emirates. It can be seen that in the current international environment, CBDC has been welcomed by more and more countries and has become a research hotspot in more and more countries, indicating that CBDC has broad development prospects.

## **3. Possible difficulties in Applying Central Bank Digital Currency to Cross-Border Payments**

Although CBDC has many advantages in cross-border payments, there are still many difficulties. This paper provides a detailed analysis of it from the following three aspects.

### **3.1. The Centralization of the SWIFT System Leads to Serious Deficiencies in the System**

As a pioneer of cross-border payment systems, the SWIFT system has established

communication standards between financial institutions. More than 80% of countries worldwide cannot make cross-border payments without the support of the SWIFT system, which occupies a dominant position in cross-border payments. Once maliciously cut off, it means that a country is excluded from the national clearing system and isolated from the national trading system. Although SWIFT is a social organization, it is actually controlled by the United States. In addition, the American dollar, as the main currency in the national trade settlement process, means that the United States can use the advantages of the U.S. dollar and its monopoly on the SWIFT system to impose economic sanctions on other countries, and use the SWIFT system to monitor the financial flow of other countries or delist sanctioned countries, which seriously affects the security of cross-border payment systems.

### **3.2. Different Standards and Systems Make CBDC Difficult to Apply More Widely**

In the process of applying CBDC to cross-border payments, the monetary policies, cross-border payment models, and standards of different countries will also affect the application of CBDC in cross-border payments. On the one hand, different countries have different attitudes towards CBDC, and their research and development progress and focus on CBDC also vary, making the payment and application of CBDC in different countries more complex; On the other hand, there are significant differences in the underlying structure and operational logic design of CBDC in many countries' central banks, such as message format, calculation logic, and corresponding technical routes. These differences in operational logic will not only have a certain impact on the connectivity and compatibility of relevant cross-border payment technologies in current countries, but also lead to serious technical barriers hindering the application of CBDC in cross-border payments. Especially at present, there is no specific and unified digital currency technology architecture and standards globally, which hinders the application of CBDC in cross-border payments and makes it difficult to widely apply.

### **3.3. Private Cryptocurrencies Pose a Challenge to CBDC**

Long before the emergence of CBDC, digital currencies existed in various forms of private encrypted currencies. Compared to CBDC, private digital currencies have stronger volatility and are also more unstable. There is a significant difference in stability compared to CBDC endorsed by national credit and the unlimited legal compensation determined by the government, and there is no physical system to support it. It provides more speculative possibilities for these private cryptocurrencies, coupled with their early start and stronger development momentum compared to the latecomer CBDC. This not only poses a strong challenge to sovereign currencies, but also has a strong impact on the further application of CBDC, leading to various financial crimes such as illegal money laundering.

## **4. The Specific Optimization Path for the Application of Central Bank Digital Currency in Cross-Border Payments**

After clarifying the problems in CBDC application and cross-border payments, further optimization of CBDC application in cross-border payments should also be carried out from multiple perspectives to further optimize the path of central bank digital currency application in cross-border payments.

#### **4.1. Jointly Building a Multilateral Central Bank Digital Currency Model**

To better promote the application of CBDC in cross-border payments, it is necessary to strengthen cooperation with neighboring countries and establish an efficient and unified central bank digital currency cross-border payment operation model. At present, China has jointly developed a digital RMB cross-border payment system with Thailand, the United Arab Emirates and other countries, and can also attract more economies to participate in the construction of a distributed cross-border payment network platform through the "the Belt and Road Initiative" and ASEAN partners. In addition, while respecting the wishes of various countries, it is possible for each country to choose whether to develop a digital currency with its own sovereignty based on its own level of income and economic development. China can provide technical support for countries willing to build a diverse central bank digital currency model, and further improve the compatibility of multilateral central bank digital currency models by integrating the technologies of different countries. [2]

#### **4.2. To Improve the Compatibility and Operability of Relevant Basic Equipment**

The most crucial point to achieve the application of CBDC in cross-border payments is to establish a cross-border payment system with unified operations and high compatibility. Specifically, efforts should be made to enable various countries to conduct multi node validation experiments in the underlying design of basic payment facilities, ensuring effective operation when conducting cross-border payments with different countries and nodes. In addition, it is necessary to adjust the transaction scale and time of CBDC in a reasonable manner based on the development trend of CBDC. Therefore, the basic transaction equipment can consider the overlapping operation time caused by time difference factors, and further reduce the development level of CBDC in cross-border payments. It can be helpful to improve the scalability of cross-border payment application equipment, and build a payment system that can support cross-border payments in different countries throughout the day. At the same time, we can also try to use blockchain technology to build an infrastructure network of CBDCs between different countries, strive to coordinate relevant exchange rate systems, macroeconomic regulation, and payment system construction systems among central banks of various countries, promote close cooperation between central banks of various countries around the world, and form unified global standards through long-term cooperation and consultation, better promoting the application of CBDCs in cross-border payments.

#### **4.3. To Promote the Construction of an International Central Bank Digital Currency Monitoring System**

China should actively cooperate with organizations from other relevant countries to further establish a CBDC monitoring system. Firstly, it is necessary to endow CBDC with the same legal status as the current legal tender of various countries, providing CBDC with the most basic legal status and sovereignty protection. A sound legal and regulatory system should be established to incorporate CBDC into specific legal regulatory frameworks; [3] Secondly, efforts should also be made to establish a unified CBDC cross-border payment standard, further clarifying the main rights and obligations of using digital currency payments in the cross-border payment process, so that sovereign countries of digital currency can better regulate CBDC in cross-border payments through unified payment standards, blockchain and distributed technology. Finally, attention should also be paid to strengthening the supervision of the fund flow situation of cross-border mobile payment related network nodes, conducting three-dimensional supervision of the legitimacy of cross-border

payment behavior entities, in order to establish corresponding financial risk plans for sudden problems faced by CBDC when applying cross-border payments, and improve the risk prevention level of CBDC when applying cross-border payments.

## 5. Conclusion

In summary, it is necessary to start from an international perspective to further optimize the path of CBDC application in cross-border payments. It can not only strengthen cooperation with neighboring countries and improve the compatibility of cross-border payment related equipment, but also actively cooperate with international central banks. The research aims to further strengthen the construction of digital currency monitoring systems, and promote the application of CBDC in cross-border payments from multiple perspectives.

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