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Problems of Constructing and Optimizing a China-Russia Cross-Border CBDC Payment and Clearing System

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Abstract

The relevance of the study is driven by the need to diversify payment channels between the Russian Federation and the People's Republic of China amid geopolitical instability and increasing sanctions pressure from Western countries. The aim of the research is to analyze the technical, regulatory, and macroeconomic aspects of constructing and optimizing a China-Russia cross-border CBDC payment and clearing system. To achieve this goal, the following tasks were addressed: identifying key problems in the field of bilateral settlements, examining issues related to ensuring compatibility between the technological platforms of Russia and China, and identifying specifics in developing a legal framework for the monetary policies of both countries. The research methods included: comparative analysis of regulatory documents and technological standards governing the issuance and use of CBDC in Russia and China; theoretical assessment of the impact of a cross-border CBDC system on macroeconomic indicators; analysis of existing cross-border payment system projects to identify strengths and weaknesses of the China-Russia cross-border CBDC payment and clearing system. The study concluded that the successful implementation of a China-Russia cross-border CBDC payment and clearing system would significantly reduce transaction costs, increase the speed of settlements between the two countries, and strengthen economic integration in the context of growing geopolitical instability and sanctions pressure from Western European countries.

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Keywords

World economy, cross-border payment and clearing system, economic integration, technological platform, Russia-China cooperation.

Introduction

The relevance of the study lies in the fact that such systems of international settlements as, for example, SWIFT, demonstrate vulnerability to political influence, which creates risks for the continuity of trade and financial transactions between the two countries. In this context, the construction of a cross-border payment and clearing system based on central bank digital currencies (CBDCs) is the most promising direction that can ensure greater independence and stability of bilateral settlements between the Russian Federation and the People's Republic of China.

In the context of geopolitical instability and increased sanctions pressure on the Russian Federation, the development of alternative mechanisms for cross-border payments is of strategic importance [Bank for International Settlements, [www](#)].

For example, solutions such as the Financial Messaging System (SPFS) of the Bank of Russia, although they provide an internal alternative to SWIFT, are limited in their international functionality and require further development to integrate with the payment infrastructure of other countries. From this point of view, CBDCs represent a technologically advanced solution that has the potential to eliminate intermediaries in international transactions, reduce transaction costs, and increase the speed of settlements.

CBDC or Central Bank Digital Currency is a digital currency that is issued and regulated by a country's central bank. Unlike traditional physical currencies, such as banknotes and coins, CBDCs exist only in digital form [Skobelev, 2020, p. 9].

A study conducted by the IMF in 2024 highlights the potential of CBDCs to improve the efficiency and security of payment systems, as well as to stimulate financial innovation [Lagarde, 2018]. In particular, the possibility of direct interaction between CBDCs issued by the central banks of Russia and China will create a bilateral payment channel that is independent of traditional correspondent accounts and exposure to sanctions risks.

According to the researchers, the technological base of this system may include the use of distributed ledger (DLT) to ensure the transparency and security of transactions, as well as smart contracts to automate the execution of payment obligations [Yao, [www](#)].

The prospects for the implementation of such a project are associated with the need to solve a number of technical and regulatory issues. An important aspect is to ensure the interoperability of the technological platforms used by the central banks of both countries, as well as the development of common standards and protocols for cross-border payments. In addition, data protection and transaction privacy, as well as anti-money laundering and counter-terrorist financing (AML/CFT) compliance, must be considered.

For the successful implementation of the project of the Russian-Chinese payment clearing system, it is also planned to conduct pilot projects and test various technological solutions [Mu, [www](#)]. At the same time, an important step is the creation of a working group with the participation of representatives of the Bank of Russia, the People's Bank of China, as well as experts in the field of financial technologies and law. The results of this research and development should form the basis for the creation of a regulatory framework governing the use of CBDCs for cross-border payments between the Russian Federation and the People's Republic of China.

The development of a cross-border payment system based on CBDC is a complex but promising task that requires coordinated efforts on the part of regulators, financial institutions, and technology companies. According to the researchers, the successful implementation of this project will strengthen

economic cooperation between Russia and China, ensure greater independence from external factors and create a precedent for the development of similar systems with other countries.

The historiography of the research topic is quite extensive and includes the works by such authors as S. Dhar, B. Eichengreen, S. Lagarde, Mu Changchun, et.al.

In particular, the problems of testing various technological solutions in the field of a cross-border payment clearing system based on CBDC between Russia and China are considered in the works by such authors as R. Auer, C. Cornelli, J. Frost, U. Bindseil, L. Brainard, et.al.

The issues of optimizing the Sino-Russian cross-border payment and clearing system are considered in the works by such researchers as O. Skobelev, Yao Qian, Zhou Xiaochuan, et.al.

However, there is a need to systematize the problems associated with the creation and implementation of a CBDC-based cross-border payment clearing system between Russia and China.

Sino-Russian Cross-Border Payment and Clearing System (CBDC): problems of creation and optimization

Theoretical concepts emphasize that in an idealized system of international transactions, the use of national currencies in most payment transactions is a priority [Obstfeld, Rogoff, www]. Shifting the emphasis to settlements in national currencies helps minimize the risks associated with foreign economic activity, in particular, currency fluctuations, transaction costs and political risks, including the possibility of discriminatory measures by trading partners.

Back in 2015, the Russian Federation proclaimed a strategy for the gradual displacement of foreign currencies from international settlements with an emphasis on the use of the Russian ruble [Obstfeld, Rogoff, www].

However, a complete replacement of foreign currencies does not always seem feasible in practice. The volume of the national currency of the exporting country available to foreign counterparties may be insufficient to cover the entire volume of export transactions. For example, when switching to settlements in rubles with all trading partners of the Russian Federation that have a negative trade balance, a deficit of ruble liquidity will arise. We can state that these partners will not have enough ruble revenue from imports of goods to Russia to pay for Russian export deliveries. This, in turn, will lead to the need to find mechanisms to cover the emerging deficit in mutual settlements, but will not fundamentally solve the problem of settling the balance of foreign trade [Obstfeld, Rogoff, www].

In whole, the idea of creating cross-border payment systems based on central bank digital currencies (CBDCs) is attracting more and more attention from researchers in the context of increasing geopolitical tensions between Russia and Western countries, as well as the diversification of international payment mechanisms. The formation of a Sino-Russian cross-border payment and clearing system CBDC is a promising direction, which, however, is fraught with significant theoretical and practical difficulties.

Theoretical Foundations of CBDC and Cross-Border Payments

The concept of CBDC as a digital form of national currency issued by a central bank can help eliminate intermediaries, reduce settlement times, and increase the transparency of transactions. However, the integration of CBDCs of various countries, and in particular Russia and China, requires addressing issues of interoperability, standardization of protocols, and harmonization of the requirements of the currency regulators of the two countries.

The successful convergence of CBDC initiatives in Russia and China hinges on establishing a common technological framework. This encompasses not only the underlying distributed ledger

technology (DLT) but also the application programming interfaces (APIs) that facilitate communication between different CBDC platforms. A lack of standardization in these areas could lead to fragmentation, hindering cross-border payments and potentially creating arbitrage opportunities. We can say that interoperability is a key factor in determining the overall efficiency and usability of CBDCs in a globalized financial system.

At the same time, the legal and regulatory landscape surrounding CBDCs in both countries must be carefully aligned. Divergences in data privacy regulations, anti-money laundering (AML) requirements, and know-your-customer (KYC) procedures could present significant obstacles to seamless integration. The People's Bank of China (PBOC), for instance, has emphasized the importance of maintaining a «managed anonymity» approach to its digital yuan (e-CNY), while the Central Bank of Russia (CBR) is exploring various models for its digital ruble, including tiered access based on identity verification levels. These differences require careful consideration and potentially the development of specific protocols to ensure compliance with both jurisdictions.

The geopolitical context also plays a crucial role in shaping the trajectory of CBDC integration between Russia and China. Both nations have expressed a desire to reduce their reliance on the US dollar and the SWIFT payment system. The development of a joint CBDC infrastructure could be seen as a strategic move towards greater financial autonomy and a potential challenge to the dominance of the existing international financial order. However, such a move could also attract scrutiny from other major economies and potentially trigger retaliatory measures.

The technical architecture of the integrated CBDC system must address concerns related to scalability, security, and resilience. So, this system needs to be able to handle a high volume of transactions without compromising performance or data integrity. That's why the robust cybersecurity measures are essential to protect against potential attacks and prevent unauthorized access to sensitive information. Moreover, the system should be designed to withstand disruptions and maintain operational continuity in the face of unforeseen events. Effective risk management frameworks, as recommended by the Financial Stability Board (FSB) in its reports on crypto-assets, are paramount to ensuring the stability and reliability of the integrated CBDC system.

China's experience in the development of the digital yuan (e-CNY)

China is one of the leaders in the development and implementation of CBDCs. The digital yuan (e-CNY) is being actively tested in a variety of scenarios, including retail payments, corporate transactions, and cross-border trade [Zhou, www]. In particular, a study by the People's Bank of China (PBOC) emphasizes the role of the e-CNY in strengthening the financial infrastructure and increasing the competitiveness of the yuan in the international arena [Yao, www].

In the context of cross-border transactions, the e-CNY is seen as a tool to circumvent sanctions and reduce dependence on the dollar system. However, according to the researchers, the successful integration of e-CNY into the international payment system requires overcoming regulatory barriers and ensuring interoperability with other CBDCs [Mu, www].

Russian initiatives in the field of the digital ruble

In recent years, the Bank of Russia has been actively developing a digital currency called the «digital ruble». At the same time, the officially announced concept of the digital ruble provides for its use for retail and wholesale payments, as well as for cross-border settlements [Lagarde, 2018, p. 37].

Modern research conducted by the Bank of Russia highlights the potential benefits of the digital ruble in improving the efficiency of payment systems, reducing transaction costs, and ensuring financial stability [Mu, www].

Some researchers also believe that in the context of Sino-Russian cooperation, the digital ruble can

become an alternative tool for settlements in national currencies, reducing dependence on the US dollar and increasing resistance to sanctions pressure [Zhou, www].

Problems and challenges of building a Sino-Russian cross-border payment and clearing system CBDC

Building a Sino-Russian cross-border CBDC payment and clearing system faces a number of significant problems and challenges, which can be classified as follows:

- Technological interoperability: ensuring interoperability between the various technological platforms used for the e-CNY and the digital ruble is a complex task that requires the standardization of protocols and the development of interoperable interfaces [Yao, www];
- Regulatory barriers: harmonizing regulatory requirements in the field of CBDC, including privacy, data protection and anti-money laundering issues, requires intensive negotiations and coordination of positions [Financial Action Task Force, www];
- Geopolitical risks: the creation of an alternative payment system that does not depend on the US dollar may cause a negative reaction from Western countries, which may lead to new sanctions and restrictions [Eichengreen, www].
- Cybersecurity: ensuring the security and resilience of the CBDC cross-border payment system against cyberattacks is a critical condition for its successful operation [Yao, www];
- Currency risks: fluctuations in exchange rates between the yuan and the ruble can create risks for participants in cross-border transactions, which requires the development of hedging mechanisms and currency risk management [Lagarde, 2018].

Directions for further research

To successfully build and optimize the Sino-Russian cross-border CBDC payment and clearing system, further research is needed in the following areas:

- Development of models of interaction between the e-CNY and the digital ruble, taking into account technological, regulatory and geopolitical factors.
- The economic analysis of the creation of an alternative payment system for trade and investment between China and Russia.
- Assessing the risks and opportunities of using CBDCs to circumvent sanctions and reduce dependence on the dollar system.
- Development of mechanisms for managing currency risks in cross-border transactions using CBDC.
- Study of cybersecurity and data protection issues in cross-border CBDC payment systems.

Thus, it can be stated that the creation of a Sino-Russian cross-border payment and clearing system CBDC is a difficult but promising task. Successful solution of this task requires further scientific research, the development of innovative technological solutions and close cooperation between the regulatory authorities and financial institutions of the two countries.

Conclusion

Based on the results, the following conclusions were drawn: optimizing CBDC requires overcoming a number of key challenges, including the need to reach consensus on technological standards and interoperability protocols, harmonize regulatory frameworks regarding AML / KYC and data protection, as well as ensure the cybersecurity of the system from potential threats. It is also important to take into account the positions of third countries and international financial institutions, which may consider this initiative as a challenge to the existing global financial architecture.

Thus, the prospects for the Sino-Russian cross-border CBDC payment and clearing system implementation largely depend on the ability of the parties to develop a mutually beneficial cooperation model based on the transparency, predictability and mutual trust. At the same time, according to the researchers [Auer et al., 2020, p. 88], an important condition for the successful implementation of the Sino-Russian cross-border payment and clearing system CBDC is the active involvement of the expert community and the private sector in the process of developing and implementing the system, which will take into account the diverse needs of users and ensure its competitiveness at the international level.

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Проблемы построения и оптимизации китайско-российской трансграничной платежно-клиринговой системы CBDC

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Аннотация

Актуальность исследования обусловлена необходимостью диверсификации платежных каналов между Российской Федерацией и Китайской Народной Республикой в условиях геополитической нестабильности и усиления санкционного давления со стороны стран Запада. Цель исследования заключается в анализе технических, регуляторных и макроэкономических аспектов построения и оптимизации китайско-российской трансграничной платежно-клиринговой системы CBDC. В рамках достижения поставленной цели были решены следующие задачи: выявлены ключевые проблемы в сфере двусторонних расчетов, рассмотрены вопросы обеспечения совместимости технологических платформ России и Китая, выявлены особенности разработки правовой базы для монетарную политику обеих стран. В качестве методов исследования использовались: сопоставительный анализ нормативных документов и технологических стандартов, регулирующих выпуск и использование CBDC в России и Китае; теоретическая оценка влияния трансграничной системы CBDC на макроэкономические показатели; анализ существующих проектов трансграничных платежных систем для выявления сильных и слабых сторон китайско-российской трансграничной платежно-клиринговой системы CBDC. По итогу проведенного исследования были сформулированы следующие выводы: успешная реализация китайско-российской трансграничной платежно-клиринговой системы CBDC позволит существенно снизить транзакционные издержки и повысить скорость расчетов между двумя странами, а также укрепить экономическую интеграцию в условиях нарастающей геополитической нестабильности и санкционного давления со стороны западноевропейских стран.

Для цитирования в научных исследованиях

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Ключевые слова

Мировая экономика, трансграничная платежно-клиринговая система, экономическая интеграция, технологическая платформа, российско-китайское сотрудничество.

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