

National features of Central Bank Digital Currency (CBDC) development in the post-covid period: global experience

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Abstract. The article considers a new modern form of money – central bank digital currencies (CBDCs). Their main characteristics are security, fast and inexpensive transactions. Digital currencies are currently going through a stage of institutionalisation and active development. The Bank for International Settlements predicts that 20 per cent of regulators plan to launch retail CBDCs by 2026. Currently, the global community has not developed a unified position either on the issue of the expediency of their issuance (although every year more and more countries are engaged in their development and issuance), or on the issues of volumes and areas of regulation. A number of countries are taking a wait-and-see attitude, closely monitoring the development of digital currencies (e.g., Japan). Therefore, the study of global experience is extremely relevant, especially for Russia. The study identified a number of legislative, technical, and economic problems related to the functioning of digital currency. There are challenges on national governments recognition of digital currency as a legal tender; cybersecurity risks and threats; challenges caused by different ways of integrating digital currency into monetary policy; digital currency as a real threat to the entire global financial system, etc. Thus, the practical development and testing of CBDCs are one of the main trends in the modern monetary sphere development. However, as part of the development of CBDCs, in order to maintain public trust, the central bank should act by engaging with market participants while maintaining its primary role in the ecosystem.

Keywords: central bank digital currencies (CBDCs), cryptocurrency market regulation, central bank, payment system, international currency, e-wallet.

JEL codes: G28, E58, F33

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Introduction

The digital currency market has gone through several stages in its development. Thus, the very first cryptocurrency appeared almost a decade and a half ago. Today there are about 20,000 different types of cryptocurrencies. Since their emergence in 2009, cryptocurrencies have been an uncontrolled coin of regulatory bodies. Moreover, their impact on the national economy has not been investigated, so at the initial stage after their emergence, states tried to restrain their functioning.

States aim to control transactions with cryptocurrencies and digital currencies, primarily to prevent the financing of terrorism and money laundering. Therefore, they create their national coins, which are issued and regulated by central banks. In many ways, today central banks digital currencies are already coming to the forefront, with cryptocurrency being the basis for their creation and functioning. Thus, today states are actively adopting their national cryptocurrency, which is issued by the country's central bank; it is also considered a legal tender like other traditional currencies. In July 2018, 15 countries were conducting studies on the possibility of developing and implementing CBDC; in 2023, more than half of all world central banks were studying the prospects of using digital currencies. Today, half a dozen countries, mainly in Africa, the Caribbean and South-East Asia, have fully operational CBDCs. In general, these countries have a low level of access to bank services. Therefore, in such circumstances, digital currency is an innovative way to develop national payment systems.

Main part

There was initial interest in digital currency in 2014. For the first time, Ecuador tested the rationality of using digital currency, as almost 40% of the country's population did not have access to financial services. The Ecuadorian authorities decided to fix the economic situation in the country by launching the digital sucre in order to realise the rapid development of the payment infrastructure and solve the problem regarding financial inclusion. Ecuador has not been able to achieve the successful implementation of digital sucre. The main reasons are, firstly, the level of country economic development is too low, and secondly, there is low demand.

Uruguay also had the experience of launching a digital currency – e-Peso in 2018. The International Monetary Fund appreciated the implementation of the country's pilot project, but the digital currency was withdrawn from circulation.

Two Scandinavian countries – Norway and Sweden – in 2018 started an active study of the digital currency implementation. Riksbank (Bank of Sweden) is testing a digital currency – e-krona, the launch of which is driven by the recent sharp decline in the use of cash in payment transactions. A complete transition to cashless money is gradually taking place in Switzerland. According to the Bank of Sweden's research, digital currency will enable to support pure competition between fintech companies and commercial banks, and expand the possibilities of state control over money flows. But despite the increased interest of the Nordic region in launching a digital currency, there is no decision to start issuing a digital currency – the implications, challenges, and risks of its launch are still only being explored. Notably, among the challenges of the CBDC launching, the issues of smooth functioning of the technical infrastructure, effective supervision, and protection of personal data are also highlighted¹.

One of the nations in the Southeast Asian region also testing a digital currency – the digital baht (BoT) (wholesale CBDC), is Thailand. This pilot project began its development in 2018. It involves strengthening cooperation between the Central Bank and some major financial institutions. In 2020, the BoT announced the creation of another cross-border transfer method, and developed it with the Hong Kong Monetary Authority. Thailand's CBDC aims to enter the retail market, but the authorities are concerned about the implications - considering the benefits and risks of introducing it into the monetary sphere. This Thai pilot project has made it possible to conduct bank payments bypassing any banking institution participants (Digitalisation on Financial Services and Implications for Monetary Policy in Thailand, 2018).

In autumn 2020, Cambodia and the Commonwealth of the Bahamas were the first states to announce the equal properties of an international currency with an issued national cryptocurrency. The Bahamas has significant limits on access to finance by foreign governments as a result of its special geographical location. In addition, it is quite common for the islands to experience cash losses due to frequent natural disasters. Therefore, for Bahamians the development of digital currency is one of the methods of safeguarding their money, as well as a way to make online payments. Storage and transactions of money are performed through an electronic wallet. The Bahamas' digital currency, the SandDollar, is valued at a 1:1 ratio to the Bahamian dollar, which in turn is pegged to the US dollar (Zhang et al., 2017).

In 2020, Cambodia announced Bakong, a national cryptocurrency. It performs payment transactions with both the Cambodian riel and the US dollar. To access Bakong, one must have a Cambodian phone number as well as an active Cambodian bank account. The Bakong e-wallet is linked to the bank accounts of the system users, which is supervised by the National Bank of Cambodia – all transactions are controlled by the Central Bank of Cambodia. The main motivation for the CBDC establishment in Cambodia is the development of financial inclusion. As a consequence, the development of digital payment services becomes a natural way to maximise the efficiency of the national payment system.

In 2021, member countries of the currency union of the Organisation of Eastern Caribbean States (OECS) began developing a national cryptocurrency. In the spring of 2021, the Central Bank of the Eastern Caribbean began issuing the national cryptocurrency DCash in the member countries: St. Kitts and Nevis, Barbuda and Antigua, St. Lucia and Grenada. The main goal of DCash implementation was to improve the

¹ Riksbank, E-krona. Bank of Sweden Official Website. Available at: <https://www.riksbank.se/en-gb/payments--cash/e-krona/> (accessed 06.11.2023)

availability, security, and quality of payment services. In addition, its introduction has significantly increased the speed of transactions to other countries (Kochergin & Yangirova, 2019).

In 2021, Nigeria announced the launch of its national cryptocurrency – the digital naira, eNaira. According to international rankings, Nigeria is the country with the highest cryptocurrency ownership in the world (24.2%)². The main purpose of the CBDC establishment in Nigeria was to create a situation related to financial stability, strengthen monetary sovereignty, and the development of payment services. Nigeria's national cryptocurrency was created as part of a programme to develop the digital economy and had the major motive of simplifying financial transactions for citizens, and thereby promoting financial inclusion.

Japan launched testing of the digital yen in 2021. The government plans to conduct three phases, the first aimed at testing the supporting functions, the second – to study its «behaviour» in the financial environment, and the third, which began in the spring of 2023 – aims to gradually connect individuals and businesses. At the same time, it plans to test credit cards that support the Bank of Japan's digital currency, marking the beginning of the development of the user's infrastructure. However, the test transactions with the digital yen today are of a simulated nature, i.e. without involving individuals. Thus, it is expected all these processes and the testing itself will be completed by 2026.

A particular feature of the digital currency creation in Japan is that large Japanese companies are interested in their creation and development. Government initiatives in this area are actively supported by business. Thus, an association of more than 70 companies and non-governmental banks are working on the creation of their own digital currency called DCJPY. It is planned to create a unified platform for making transactions, the security of which will be based on blockchain technology. The ratio to the yen is also planned to be set at 1:1. Bank deposits, on the other hand, will provide this digital currency. The interest of companies in this development lies in the need to increase the speed of transactions, as well as to reduce commissions³.

The main reasons for Japan's introduction of a state digital currency include: the interest of Japanese companies and banks in it (reduction of commissions, increase in the speed of transactions, etc.); the global trend towards digitalisation, and Japan, as a high-tech country, should not lower the bar, but develop in an innovation-technological direction in accordance with the time; reduction of the state's costs for production, storage, security, and transportation of tangible money; strengthening of the yen to increase its competitiveness in relation to the national currency; and the introduction of a digital currencies in other countries – among regional neighbours (South Korea, China).

Japan remains hesitant to adopt the digital yen and is taking a wait-and-see attitude. It is closely following the development of digital currencies in the U.S., Europe, China and other countries to create an innovative, competitive currency that could contribute to Japan's influence in the international arena⁴.

Moreover, Japan is one of the most technologically advanced countries in the world. It is still dominated by cash payments, even when it comes to large transactions. Perhaps, before a full-scale introduction of digital currency, the Japanese authorities will have to establish fiat cashless settlement by providing initial advantages or incentives.

In general, 2021 was a period of active research by authorities on digital currency, its benefits and threats associated with its emission. Also, central banks in this period began to launch pilot projects. The most striking event was the large-scale testing of the crypto-yuan in China – e-CNY. In just a few years, China has become a world leader in terms of its CBDC scale of piloting project (Takuma, 2020). The distinctive feature of the creation and development of the digital yuan is the presence of the state structure represented by the NBK. NBK is the main initiator and executor since the beginning of the project. It provides its activity with the approval of the highest leadership of the country, which is an important advantage of this project.

Development of a national cryptocurrency in China began in 2014, and consisted of several phases. The

² *Finder Cryptocurrency Adoption Index. Available at: <https://blog.chainalysis.com/reports/2021-global-crypto-adoption-index/> (accessed 06.11.2023)*

³ *More than 70 Japanese companies in 2022 intend to launch a new digital currency. Available at: <https://tass-ru.turbopages.org/turbo/tass.ru/s/ekonomika/13015921> (accessed 06.11.2023).*

⁴ *The Bank of Japan will start the last stage of testing the digital yen in 2023. Available at: <https://tass.ru/ekonomika/16412717/amp> (accessed 06.11.2023).*

first phase took place from 2014 to 2016, when a digital currency development working group was established and began research. In 2016, the NBK created a prototype of the first-generation digital currency and established the Digital Currency Institute. It developed the concept of digital yuan. The second phase began in late 2017, involving major commercial banks, telecommunications companies, and payment service providers (Kochergin, 2022). During this phase, applications for interacting with digital RMB were created, digital wallet standards were developed, and requirements for payment security and regulation were formulated. In 2019, the third stage began with the launch of pilot projects for the use of digital yuan in the country.

China's active testing of its national digital currency e-CNY has attracted considerable attention from all over the world, both in terms of the volume of testing itself and the number of digital yuan users. The issue of the consequences of its launch in full directly for China itself becomes a logical one. We will consider the prospects of e-CNY implementation for China and its citizens. Firstly, the digital yuan helps China fight threats to monetary sovereignty from private cryptocurrencies. According to the Chinese authorities, the emission of the state digital currency is an alternative to private cryptocurrencies. Therefore, the yuan's position will be stronger, and it will be easier for the government itself to maintain its stability. Secondly, it is a good opportunity for the Chinese government, particularly the NBK, to collect the most accurate and reliable data on all the preferences and habits of the country's population based on the expenditures made by them. Moreover, it is important for a comprehensive study of current economic trends and making forecasts of consumer behaviour⁵.

An important advantage, according to the PRC, is the development of crypto-yuan for the purpose of providing material assistance in a difficult situation to its citizens: the possibility of sending digital money for food and medicine. Moreover, the Chinese authorities will have the ability to decide who can access these digital assets in order to prevent alcoholism, drug use, etc. Also, it concerns unstable political and economic situation, in case of illegal activities, citizens' wallets will be switched off.

The prospects for the crypto-yuan development are both in the global and domestic market of the PRC. Since 2021, China's digital currency has been appearing on various stock exchanges. The main goal of the Chinese authorities regarding crypto-yuan is to turn it into a national currency, which will be the main competitor of virtual coins. Moreover, China is exploring cross-border transactions using crypto-yuan.

One of the main reasons for the digital yuan's creation was an attempt to counter the dominant dollar. Today, US dollar is the leading currency, and it has a huge impact on the global economy and politics. China, in turn, stands out in the world market with its productive power and high level of exports. However, most settlements are still made in dollars. It strengthens this currency and makes China and other countries dependent on it, which strengthens the position of the USA. This gives America the opportunity to impose its own rules in various international spheres, infiltrate and influence global processes. To counter the hegemony of the US and the dollar, China is taking steps to establish and develop its national currency (in any form), internationalise it, and offer it as an alternative, as well as to increase the level of its own economic independence⁶.

The European Central Bank (ECB) has launched a digital currency, the digital euro. The ECB, actively explore all the possibilities of the TIPS fast payment service, tend to provide a technical solution for its digital currency. The main motivations were to ensure the sovereignty of the digital euro, include it in the pan-European payment system, the European Payments Initiative, and apply it to international transactions. Nevertheless, the US does not participate as a member of the ECB Advisory Group. It could damage Europe's financial stability and sovereignty⁷.

The US approached the issue of launching a digital dollar in detail in 2020. The country's authorities have decided to explore the challenges and opportunities associated with issuing a digital currency. The Federal Reserve Bank of Boston, which will work with the Massachusetts Institute of Technology to develop, study

⁵ *China launches state cryptocurrency: how it can change the financial world. Available at: <https://vc.ru/finance/122749-kitay-zapuskaet-gosudarstvennyuyu-kriptovalyutu-kak-eto-mozhet-izmenit-finansovyy-mir> (in Russian) (accessed 06.11.2023).*

⁶ *Chinese digital currency threatens the «status» of the U.S. dollar. Available at: <https://zn.ua/amp/WORLD/kitajskaja-tsifrovaja-valjuta-uhrozit-aet-statusu-ameri-kanskoho-dollaru-ft.html> (accessed 06.11.2023)*

⁷ *Cryptoast. Available at: <https://cryptoast.fr/> (accessed 06.11.2023)*

and test the DH in conjunction with the Federal Reserve Bank of Boston, announced about the potentially issued digital currency of the US Federal Reserve. At the same time, the US has not yet officially decided to issue a digital dollar (while China and the EU are already well ahead of them in the process of digital currency development). According to the researchers, if the international financial infrastructure based on the US leadership develops a more modern and technological alternative (for example, based on the successful experience of China), it may lead to the beginning of «dedollarisation» of the global financial system⁸. An important feature of the US digital dollar development is the private sector's efforts and initiatives, while the government takes a wait-and-see attitude (in contrast to China and the EU, where official government agencies are involved in the development). This is also evidenced by the statement of a senior FRS official Nelly Liang. In December 2022 she stated that there was no need for accelerated implementation of the digital dollar. According to her, the leading international position of the dollar is not due to technological, but to the political and economic achievements of the United States⁹. Therefore, there is no need to expect a full-scale implementation of the digital dollar in the near future.

According to international experience, the opportunities and challenges directly related to the launch of the CBDC in the Eurasian space are being explored. Kazakhstan and Russia are leaders in this region in exploring the above issue and making progress.

Officials in Russia began testing the digital rouble at the end of winter 2022. On 1 August 2023, the law on the digital rouble, which is a digital code storing in an electronic wallet, goes on to the statute book. The digital rouble is the third form of money, along with cash and non-cash. But it will not yet enter widespread circulation. The Central Bank of Russia started testing it in August 2023. 13 banks were taking part in this testing. The tests are conducted on a limited circle of clients and employees of large credit organisations¹⁰.

Moreover, for people using the digital rouble, the main feature of the digital rouble will be the possibility to use it when the Internet is switched off, unlike non-cash funds. According to the experts, by using the digital rouble it is possible to avoid illegal transfers and stealing money from the citizens accounts. A distinctive country viewpoint is the statement declaring cryptocurrencies in general not to be money. Additionally, the authorities note that CBDCs are not cryptocurrencies.

Currently, in Russia there is an issue of developing a new payment system. An important fact is to prevent monopolization of the ecosystem by the fast payment system. Then Russia will have access to the market of fintech companies. There will be an increase in the payment market and financial services market competition. As a result it will cause a decrease in the tariffs set for the transactions made and an increase in their quality and quantity.

However, Armenia, Belarus, and the Kyrgyz Republic are interested in CBDC; they are also developing approaches to its use. For example, the President of the Kyrgyz Republic recently announced the «e-Som» project, which will be backed by national gold. Representatives of the National Bank of Belarus stated the potential benefits of introducing a digital national currency for both users and businesses¹¹.

Nevertheless, experts in international economic development have differing views on the prospects for digital currencies. In particular, the integration of digital and traditional markets into each other will be one of the possible ways of digital currencies development. It will provide favourable conditions for a common ecosystem development. This system involves interrelation between the economic sectors (Mosakova, 2023). However, the development of digital currencies issued by central banks can negatively effect on the use of cryptocurrencies as they become more insecure and expensive.

However, there are a number of legislative, technical, and economic problems with the functioning of

⁸ *Cryptoast*. Available at: <https://cryptoast.fr/> (accessed 06.11.2023)

⁹ *Digital Dollar Is a Long Way From Reality, US Treasury Official Says*. Available at: <https://www.bloomberg.com/technology?source=eyebrow> (accessed 06.11.2023)

¹⁰ *Sberbank, VTB, Alfa Bank, Tinkoff Bank, Gazprombank, Rosbank, Promsvyazbank, Sovcombank, Ak Bars, Dom.RF, Sinara, Soyuz, TCB, MTS Bank and Qiwi Bank participated in the first stage of testing the prototype digital rouble platform, which ended in February 2023.*

¹¹ *Rise of the central bank digital currencies: drivers, approaches and technologies*. Available at: <https://www.bis.org/publ/work880.pdf/> (accessed 06.11.2023)

CBDCs.

Firstly, national governmental accept of CBDCs as legal tender. In case of rejection, CBDCs will not be able to become widespread currency. Moreover, the issuance of CBDCs in some world countries is likely to have a negative impact on the economies of other countries. In particular, there may be capital flows from one country to another (depending on the interest rate). As a consequence, there will be a need for coordination of national government monetary policies at the international level, including the participation of the IMF (Meaning, 2018).

Secondly, cybersecurity. The cryptocurrency market is very unstable due to a high risk of hacker attacks. It sometimes causes the bankruptcy of leading crypto exchanges and non-return of users' funds. Therefore, there is a need to develop robust mechanisms to protect CBDCs, taking into account the experience of private cryptocurrencies. One way to minimise cyber risks is to emit a relatively small amount of CBDC for parallel circulation with existing fiat money in order to test the security system.

Thirdly, there are challenges arising from the different ways of integrating the CBDCs into monetary policy – cash substitution, cash complementation, or parallel circulation (Kochergin & Yangirova, 2019).

In the first case, their impact will be minimal. However, in the other two cases, the degree of influence can be higher – by strengthening the transmission mechanism of monetary policy: in the case of introduction of the CBDC, the time lag between changes in the key rate of the Central Bank, and changes in deposit and lending rates will be significantly reduced. It can cause a significant reduction in lending.

Fourthly, the issue of the legitimacy of CBDCs: formally, the Central Bank today does not have the right to emit its own digital currencies. Therefore, it is necessary to make appropriate changes in the current legislation of the world's countries. Today, only a quarter of CBs already has had this right or in the process of reforming their national legislation.

Fifthly, CBDCs may become a real threat to the entire global financial system. Therefore, it is necessary to coordinate legislative regulation of CBDCs at the intergovernmental level. Thus, if retail CBDCs became a real alternative to risk-free bank deposits within the investment portfolio, there will be a free flow of capital. Especially in case of an economic crisis, there will be a «digital flow of capital» from private banks to the central bank (Meaning, 2018).

Thus, the introduction of CBDCs has its advantages and disadvantages. The national financial regulators should take them into account when introducing into the monetary sphere.

Today, the potential for cross-border use of CBDCs is being actively explored within the framework of bilateral and multilateral agreements between CBs as well as international organisations. The mCBDC Bridge (mBridge) project, which was initiated by Hong Kong and Thailand back in 2019, is being actively developed¹². The project is aimed at creating a system of multi-currency exchanges using the CBDCs of its member countries – the main objective of the mBridge system is to unite the markets of the member countries for cross-border transfers¹³.

Conclusion

Currently, digital currency is going through a stage of its active development, use, and detailed research. Thus, according to the forecasts of the Bank for International Settlements, 20% of regulators plan to put retail digital currency into circulation by 2026. Its main characteristics are security, fast and inexpensive transactions. Based on the experience of launching CBDCs by different world countries, the issuance of CBDCs is conducted with the aim of increasing financial accessibility. The experience of launching digital currencies in world countries also shows the feasibility of creating new payment systems to ensure the smooth functioning of international transactions. Practical development and testing of CBDCs is one of the main trends in the development of the modern money circulation sphere. For example, China, Singapore, Japan, Switzerland, Canada, etc. implement it. Moreover, every year more and more central banks and/or

¹² China also joined this project in February 2021, which is an indirect indication of the project's high degree of readiness.

¹³ Inthanon-LionRock to mBridge: Building a Multi CBDC Platform for International Payments. – Hong Kong Monetary Authority's official website. Available at: URL: https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Inthanon-LionRock_to_mBridge_Building_a_multi_CBDC_platform_for_international_payments.pdf (accessed 06.11.2023)

financial regulators are involved in the process of CBDCs development. The importance of the development and successful implementation of a domestic digital currency is enhanced with the opportunity to develop standards for the interoperability of digital currencies between different countries at the international level. China is already partially influencing this process by participating in the m-CBDC project and initiating the creation of a single Asian digital currency.

Therefore, in terms of CBDCs development, and, in order to maintain public trust, the central bank should act in co-operation with market participants, preserving its main role in the ecosystem. Interestingly, the global community has not yet reached a consensus on the feasibility of their creation and the prospects for their introduction into the financial and economic sphere.

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CONFLICT OF INTEREST

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