

Comparative Analysis of Studies Determining the Essence of a Central Bank Digital Currency

Shamshinur Yakubova¹

1. Ken Banking and Investment, Tashkent State University of Economics, Tashkent, Uzbekistan

* Correspondence: sh.yakubova@tsue.uz

Abstract: This study reviews academic work on aspects of digital currencies and provides a methodical comparative analysis of the characteristics of different forms of money, including digital currency and cryptocurrency. The results of the work indicate that digital currency is a new type of money with unique properties that include the advantages of distributed ledger technology, as well as the trust associated with traditional fiat currencies.

Keywords: distributed ledger technology, blockchain, digital asset, token, central bank digital currency, fiat money, cryptocurrencies

1. Introduction

This article examines one of the key phenomena of modern financial evolution - central bank digital currencies (CBDCs). These digital assets, emerging in the context of distributed ledger technology (DLT), go beyond the traditional perception of money, providing society with a new face of financial interactions. Based on this, responsible financial institutions are faced with the acute task of determining, for the purposes of state regulation, the relations arising as a result of the introduction of not only the digital currency of the central bank, but also for regulating relations in the field of the crypto community. A successful solution to this problem will create the necessary legal framework and neutralize the possible negative consequences of introducing digital currency into practice.

Digital technologies are rewriting the rules of the game in many areas and the financial sector is not left out of this digital revolution. The rapid development and widespread adoption of distributed ledger (or blockchain) technologies is a unique challenge facing financial markets, the answer to which is the introduction of completely new forms of money, which are called "central bank digital currencies" or CBDCs. The question that arises when discussing this concept is whether CBDCs are truly a new phenomenon of money or simply a product of modern technology.

The purpose of the article is to systematize and analyze information about digital currencies of central banks from the point of view of their nature as a new form of money in the context of distributed ledger technology..

Citation: Yakubova S. Comparative Analysis of Studies Determining the Essence of a Central Bank Digital Currency. Journal of Marketing and Emerging Economics 2024, 4(2) 15-23.

Received: 7th Jan 2024

Revised: 9th Jan 2024

Accepted: 18th Jan 2024

Published: 20th Feb 2024



Copyright: © 2024 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license

(<https://creativecommons.org/licenses/by/4.0/>).

2. Materials and Methods

The methodological basis of the study is the use of comparative analysis methods of academic articles, central bank reports and statistical data, which provides a comprehensive overview of existing knowledge. The literature review reveals key trends in the development of central bank digital currencies.

3. Materials and Methods

Currently, global digitalization has an impact on the development of almost all areas of the economy. It led to significant changes in the economy and monetary circulation. If at the beginning digitalization mainly affected the payment system and infrastructure, now the use of distributed ledger technology leads to the emergence of fundamentally new innovations in the field of money circulation. In response to the emerging problems and challenges of participants in the global economy to create alternative instruments for saving savings that do not correlate with the dynamics of traditional financial markets, new equivalents of money, the emergence of cryptocurrencies, or, as they can be called in a generalized sense, crypto-assets.

A cryptoasset is an asset that exists in digital form or is a digital representation of another asset and is created using distributed ledger technology [9]. The classification of crypto-assets includes instruments that differ in the functions they perform. In other words, if some crypto-assets can be used as a payment instrument (as one of the functions of money), then certain instruments perform only the functions of securities and cannot be used as a means of payment. Crypto assets include central bank digital currencies, electronic money, fiat cryptocurrencies, stablecoins, and tokenized assets [9].

Most central banks are turning their attention to the prospect of introducing central bank digital currencies (CBDCs) in the context of the broader digital transformation that is transforming global finance. Despite the fact that issues related to the issuance of digital securities represent a new area for financial science, they are already attracting significant attention from both financial market participants and regulators. According to the website <https://mindsmith.io>, in the global scientific and expert community there are over 210 works and studies devoted to the topic of digital currencies of central banks. Based on the categorical characteristics, these studies are divided into three groups: - studies of regulators (such as the Asian Development Bank Institute, the Bank for International Settlements, the International Monetary Fund); - studies of central banks (for example, Reserve Bank of Australia, Reserve Bank of New Zealand, Federal Reserve Bank of St. Louis, Federal Reserve Bank of Kansas City, Federal Reserve Bank of Philadelphia, US Federal Reserve Bank, Central Bank of England, Central Bank of Indonesia, Central Bank of Spain, Central Bank of Canada, Central Bank of China, Central Bank of Poland, Central Bank of Portugal, Central Bank of the Republic of Korea, Central Bank of Uruguay, Central Bank of Finland, Central Bank of France, Central Bank of Sweden, Central Bank of Japan and others); - work of research institutes (US National Bureau of Economic Research, UK Center for Economic Policy Research, Becker Friedman Institute for Economic Research, Institute of Automation of the Chinese Academy of Sciences, Mazandaran University, University of Johannesburg, Bocconi University, King Abdulaziz

University, Manouba University, University of Az- Zaituna, Nanjing University, Rutgers University, Jönköping University, R3, PWC and others) [21].

If we consider the thematic basis, then all research and work can be divided into the following topics:

- Research devoted to determining the economic and technological essence of the central heating plant.
- Discussion of the legal and legitimate foundations of the Central Bank.
- Research on the influence of the Central Bank on the financial and monetary systems of countries.
- Projects and pilot models for the implementation of central banks.

CBDCs represent an innovative response to challenges facing the traditional financial system by providing a new format of digital assets controlled and issued by state-owned banks. Various aspects of the issue, including technical, legal and economic, make the process of implementing a digital digital security system complex and amenable to in-depth analysis. Interaction between financial market participants and regulators is becoming key to ensuring the successful integration of the Central Bank into the global economy.

Thus, the real interest in central bank digital currencies demonstrates the financial community's desire to find innovative and effective solutions in the rapidly changing world of financial technology.

To date, the sharp increase in publications on the topic of options for the transition to the use of CBDC still does not answer the question of what is actually meant by this abbreviation. From the very beginning of its appearance, approaches to disclosing the definition of CBDC revealed positions that are fundamentally different from each other.

A review of the scientific literature shows that there are many approaches to defining central bank digital currencies. Some economists define central bank digital currencies as “a digital asset issued by a central bank for the purpose of making payments and settlements in retail or wholesale transactions” [16]. Other researchers interpret Central Bank digital currency as “a form of Central Bank money processed electronically that is widely available for use” [5].

The basic definition was formulated by the Committee on Payment Systems and Market Infrastructure of the BIS, according to which “CBDC is not a clearly defined term. It is used to represent a number of concepts. However, most believe that this will be a new form of central bank money, i.e., a central bank obligation expressed in an existing unit of account that serves as both a medium of exchange and a store of value” [2].

This approach has been developed in official publications of a number of leading central banks, where digital currency is defined exclusively as a digital form of monetary obligations of the central bank, and not digital money in general, which may include not only monetary obligations of the central bank, but also monetary obligations of the private sector, primarily commercial ones. banks. This is precisely the position outlined in the joint report of the BIS and a group of leading central banks. This document defines CBDC as “a digital form of central bank money and as a national currency-denominated digital payment instrument that is a direct liability of the central bank” [6].

An even more specific definition of the CBDC is contained in the report of the European Central Bank (ECB), where the digital euro is understood as “an obligation of the Euro system, represented in digital form as a complement to cash and deposits at the central bank” [24, p. 6]. Elsewhere in this report, the ECB emphasizes that the digital euro should under no circumstances be classified as a “parallel currency” [24, p. 48].

Thus, in the publications mentioned above, which reflect the official point of view of leading central banks, the CBDC is considered exclusively as a digital equivalent of the monetary base, i.e., monetary obligations of the central bank. This justifies the principle according to which the central bank should coexist with other forms of money, complement, but not replace or displace them. It is for this reason that it is inappropriate to interpret the central bank as a qualitatively new form (new essence) of money, which, being a risk-free digital obligation of the central bank, can potentially establish its monopoly, gradually absorbing all other forms of money.

Nevertheless, in a number of works, including publications of international financial organizations and central banks, there is an expansive approach to the definition of the concept of central securities. This point of view was most radically expressed by specialists from the International Monetary Fund (IMF), who in 2018 formulated a definition according to which “CBDC is a new form of money issued digitally by the central bank and intended for use as legal tender” [18]. According to the authors of this publication, the central bank represents a natural stage in the process of evolution of methods of issuing money from metallic money and credit money backed by precious metals to fiat money [18, p. 7].

Elements of a dual approach to the definition of a central bank digital currency are contained in the Bank of England report. On the one hand, it defines the central bank digital currency as “an electronic form of central bank money that could be used by the public and business to make payments and as savings” [3, p. 7]. But, on the other hand, the central bank digital currency is considered by the Bank of England as “a new form of money, which is more likely to exist alongside cash and bank deposits, rather than serve as their substitute” [3, p. 8]. From this it is concluded that the transition to the use of digital securities will facilitate the replacement of existing forms of money. But the scale of substitution and the consequences of this for monetary and financial stability will largely depend on the functionality, profitability and other design features of the central bank [3, pp. 9-11].

The position of the Bank of England is thus characterized by duality: the central bank digital currency is simultaneously considered both as a substitute and as a “new form of money”. As a substitute, the central bank digital currency does not change the principles of circulation of fiat money. As a “new form of money”, the central bank digital currency, having the privilege of legal tender as a competitive advantage, can be used under certain conditions to launch direct lending and displace the obligations of the banking sector from the sphere of monetary circulation. The inevitable consequence of this will be a conflict of interests of the central bank and the interests of credit institutions, which may result in the introduction of a 100% reserve system.

Kochergin (2022) believes that central bank digital currency can be defined as a new form of fiat money, represented by an electronic obligation of the Central Bank,

denominated in a national unit of account and acting as a means of payment and store of value [25]. Kucherov (2018) shares the same opinion: thus, the nature of such currencies allows them to be classified as fiat money, since their existence is conditional on the permission of government bodies [14].

In its most extensive form, an expansive approach to the definition of the central bank is presented in the report of the Bank of Russia "Digital Ruble" [4], where it is only mentioned in passing that by its nature the digital ruble is nothing more than an obligation of the central bank, representing not money in the broad sense words (broad money), but a digital monetary base (base money).

The Table 1 below shows the classification of crypto-assets and digital money.

Table I. Comparative Analysis of Different Forms Of Money

Characteristic	Form of Money			
	Cash	CBDC	Unsecured Cryptocurrencies	Digital Financial Assets
Issuer	central bank	central bank	Unidentified persons or private company	Private company
Technological form of emission	Electronically in DLT (token or account based)	Electronically in DLT (token or account based)	In electronic form in a distributed registry	In electronic form in a distributed registry
Anonymity	Digital code	Digital code	Possible	Absent
Instrument of payment	Absent	Absent	Yes (no, if required by the laws of the individual country)	No
Risks	Yes, depends on the established restrictions on the payment amount	Loss, theft, fraud and cyber risk	fraud and cyber risk	cyber risk
Interest accrual	No	Depends on central bank setting	No	Yes
Purchasing power support	legal means of payment	legal means of payment	No	Secured by Assets
Examples	legal means of payment	Sand Dollar, DCash, ENaira	Bitcoin, Ethereum	Tesla tokenized stock FTX, Amazon tokenized stock FTX

In the literature, among the positive qualities of national digital currencies, they highlight the impossibility of falsification, divisibility, security and cryptographic stability, high speed of transactions, transparency, the ability to significantly improve the payment infrastructure and compete with private cryptocurrencies. At the same time, the issue of such a currency entails serious challenges for the entire financial system [11]. The Bank for International Settlements identified the possibility of a significant outflow of funds from private financial institutions to central banks as the most significant and likely financial stability risk associated with the circulation of national digital currencies [2].

An analysis of Table 1 shows that central bank digital currencies represent a direct financial obligation to the central bank. However, they are heterogeneous both in terms of technical implementation and in their purpose. Based on these characteristics of digital currencies, you should pay attention to their main differences from other forms of money. First, digital currencies differ from two traditional forms of money: cash (universal use) and bank reserves (specialized use). They combine the characteristics of both forms. For example, central bank digital currencies can be accepted everywhere like cash, but are issued electronically like bank reserves.

Digital currencies represent obligations of central banks, while deposit funds and electronic money are obligations issued by private issuers. Despite possible similarities in the use of issuing technology (for example, distributed ledger technology), central bank digital currencies differ from cryptocurrencies and stablecoins. They differ in that central bank digital currencies embody the monetary obligations of the central bank, which is not the case with cryptocurrencies or stablecoins.

“Cryptocurrencies” and “stablecoins” cannot be fully considered as money, since they do not have all the characteristics necessary to fully perform the functions of money. There is no reliable guarantor that ensures the legality and reliability of their creation and use. These assets cannot be effectively used as a means of payment because they are not widely accepted for the purchase of goods and services. They also cannot be a stable measure of value and a store of value due to the significant volatility of their value relative to official currencies. Their exchange rate for national money is subject to significant fluctuations, which increases the uncertainty of their value.

From the analysis of the technological and economic essence of digital currency, we can conclude that the modern digital revolution has brought unprecedented changes to the financial world, and digital currency securities are a striking example of how advanced technologies are changing the paradigm of money. By interfering with traditional monetary policy, these digital assets are causing excitement in banking and financial circles, as well as among ordinary citizens. We agree with the opinion of Vaganova (2022) that central bank digital currencies or centralized digital currencies represent a new phenomenon in the field of monetary circulation [19]. Central bank digital currencies should be viewed not only as a third form of central bank money, but as an innovative extension of fiat money that can be introduced in addition to cash and non-cash funds, or as a possible replacement for cash. The emergence of digital currencies represents a new stage in the development of fiat money. And this new stage would have been impossible without the development of distributed ledger technology.

In addition to allowing central banks to directly participate in the financial services market by providing services to end users, the launch of a CBDC could be a strong signal to existing participants that digital transformation is a national priority.

4. Conclusion

Today, cryptocurrencies are usually based on distributed ledger technology and decentralized storage of information. However, it should be noted that this type of technology is not limited only to the field of cryptocurrencies, and it is successfully applied in various areas of the financial market. For example, this method is used to ensure the security of transactions and confirm ownership of assets. At the same time, creating a completely anonymous environment, as is implemented in the case of Bitcoin, is not mandatory.

A number of functions that were previously performed by professional participants in financial markets, such as recording completed transactions and confirming transactions, can be transferred to a distributed registry. This applies to the participation of banks, electronic money operators and other securities market participants.

Many central banks are now developing Central Bank Digital Currencies (CBDCs), which incorporate the technological advantages of cryptocurrencies while providing the guarantees of fiat currencies. The creation of the Central Bank is aimed at mitigating the risks associated with the lack of security and control on the part of the state, characteristic of cryptocurrencies. At the same time, this allows you to maintain the benefits associated with the use of distributed ledger technology.

A central bank digital currency is created using digital technology, however, unlike “cryptocurrencies” and “stablecoins”, it represents the equivalent of a national currency. Its reliable operation and maintenance of the interests of society and business is carried out by the state through the central bank, based on trust in the already existing national currency.

CBDCs combine the technical advantages of cryptocurrencies with the collateral and guarantees found in fiat currencies, making them more stable and reliable than conventional cryptocurrencies. This also helps to mitigate some of the risks associated with the lack of government control and security for cryptocurrencies.

At the same time, CBDCs open up new horizons for financial innovation by enabling the use of advanced technologies such as DLTs to improve the transparency, security and efficiency of financial transactions. However, they are also subject to challenges such as the need to balance innovation and regulation, and ensuring the safety and security of user data.

Thus, CBDCs represent an important direction in the evolution of money, combining elements of the traditional financial system with advanced technologies, their successful development and implementation can lead to significant changes in global financial practice and provide new opportunities for the economy.

REFERENCES

1. Anneke Kosse and Ilaria Mattei. Making headway – Results of the 2022 BIS survey on central bank digital currencies and crypto. BIS Papers No 136. Monetary and Economic Department July 2023
2. Bank for International Settlements. Central Bank Digital Currencies. Report. Committee on Payments and Market Infrastructures. 2018. № 174. 28 p.
3. Bank of England, «Central Bank Digital Currency Opportunities, challenges and design,» Bank of England Discussion Paper, March 2020.
4. Bank of Russia, “Digital ruble,” Report for public consultations, October 2020 (Банк России, «Цифровой рубль,» Доклад для общественных консультаций, Октябрь 2020)
5. Bindseil, U. (2020). Tiered CBDC and the Financial System. European Central Bank, Working Paper Series, 2351, 42.
6. BIS Working Papers No 976 Central bank digital currencies: motives, economic implications and the research frontier by Raphael Auer, Jon Frost, Leonardo Gambacorta, Cyril Monnet, Tara Rice and Hyun Song Shin Monetary and Economic Department November 2021
7. Blockchain Regulatory Certainty Act. <https://www.congress.gov/bill/115th-congress/house-bill/6974/text>
8. Central Bank Digital Currency Global Interoperability Principles W H I T E P A P E R J U N E 2 0 2 3
9. CRYPTOCURRENCIES: TRENDS, RISKS, MEASURES Report for public consultations Moscow 2022 (КРИПТОВАЛЮТЫ: ТРЕНДЫ, РИСКИ, МЕРЫ Доклад для общественных консультаций Москва 2022)
10. ECB, «Report on a digital euro,» ECB Report, pp. 1-55, October 2020
11. Kochergin, D. A. (2022). Central bank digital currencies: experience of introducing a digital yuan and development of a digital ruble conception. Russian Journal of Economics and Law, 16 (1), 51–78 (in Russ.). DOI: <http://dx.doi.org/10.21202/2782-2923.2022.1.51-78>
12. Genkin A. S., Mikheev A. A. Blockchain: How it works and what awaits us tomorrow. M., 2018. pp. 145–147 (Генкин А. С., Михеев А. А. Блокчейн: Как это работает и что ждет нас завтра. М., 2018. С. 145–147)
13. Hancock M., Vaizey E. Distributed Ledger Technology: beyond block chain. London, 2016. 5–6 p.
14. International Organization for Standardization (ISO). (2000). Blockchain and distributed ledger technologies: Vocabulary. 1st ed.; ISO/FDIS 22739:2020 (E); ISO). Geneva, Switzerland [22739]. <https://www.iso.org/standard/73771.html>
15. Kuchеров I. I. Cryptocurrency (ideas of legal identification and legitimation of alternative means of payment). pp. 44–46 (Кучеров И. И. Криптовалюта (идеи правовой идентификации и легитимации альтернативных платежных средств). С. 44–46.)
16. Mills D., Wang K., Malone B., Ravi A., Marquardt J., Chen C., Badev A., Brezinski T., Fahy L., Liao K., Kargenian V., Ellithorpe M., Ng W., Baird M. Distributed ledger technology in payments, clearing, and settlement. Washington, D.C., 2016, pp. 6, 10–12.
17. Official Monetary and Financial Institutions Forum (2019). Retail CBDCs. The Next Payments Frontier. <https://www.omfif.org/wpcontent/uploads/2019/11/Retail-CBDCs-The-next-payments-frontier.pdf>
18. Sakharov D. M. Central bank digital currencies: Key aspects and impact on the financial system. Finance: Theory and Practice. 2021;25(5):133-149.
19. T. Mancini-Griffoli и M. Martinez, «Casting light on central bank digital currency,» IMF Staff Discussion Note, № 8, 2018
20. Vaganova O.V., Sidibe Mahamadu, Pryadko E.A. 2022. Research and Analysis of Digital Currencies of the Central Banks (CBDC). Economics. Information technologies, 49(3): 536–545 (in Russian). DOI 10.52575/2687-0932-2022-49-3-536-545

21. Vlasov A. V. Review of the notions of distributed ledger technologies and digital assets for harmonization of their joint use. *Russian Journal of Economics and Law*, 2022, Vol. 16, No. 4.
22. Yakubova, S. S., & Raimova, M. D. (2021). The role of effective implementation of monetary policy in a pandemic condition. *Theoretical & Applied Science*, (12 (104)), 349.
23. Shuxratovna, Y. S. (2021). Pul-kredit siyosatining iqtisodiy taraqqiyotga ta'sirini modellashtirishning innovatsion yondashuvlari. *Raqamli iqtisodiyot va barqarorlik akademik jurnali*, 311-318.
24. Yakubova, S. S. Inflation Targeting in Uzbekistan: Background and First Results. *International Journal On Economics, Finance And Sustainable Development*.
25. Yakubova, S., & Yakubova, S. (2023). ISSUES OF ACCOUNTING FOR EXCHANGE DIFFERENCES AND BORROWING COSTS IN THE FORMATION OF THE COST OF INVENTORIES IN ACCORDANCE WITH NAS AND IFRS. *Economics and Innovative Technologies*, 11(5), 75–81. https://doi.org/10.55439/EIT/vol11_iss5/a10
26. Yakubova, S. (2023). RAQAMLI TEXNOLOGIYALARNING RIVOJLANISHI VA RAQAMLI AKTIVLARNING MOHIYATI. *Iqtisodiy Taraqqiyot Va Tahlil*, 1(3), 84–92. <https://doi.org/10.60078/2992-877X-2023-vol1-iss3-pp84-92>
27. Shukhratovna, Y. S., & Ali, N. M. (2023). WAYS TO IMPROVE MARKETING ACTIVITIES IN THE TOURISM SECTOR. *Gospodarka i Innowacje*, 40, 137-143.