236. THE ROLE OF CBDCS IN THE MODERN DIGITAL ECONOMY: COST REDUCTION IN FINANCIAL SYSTEMS AND A COMPARATIVE PERSPECTIVE ON CRYPTOCURRENCIES

Hirzhon M.A.

Belarusian State University of Informatics and Radioelectronics
Minsk, Republic of Belarus

Shevaldysheva E.Z. – PhD in Philology, Associate Professor

This paper examines CBDCs as sovereign money. It analyzes drivers, architecture, and key differentiators from digital currencies. Advantages like payment efficiency and monetary policy tools are discussed alongside risks like banking disintermediation.

In the context of worldwide digital transformation of finance and the rapid transformation of the payment technology landscape, the role of Central Bank Digital Currencies has become a focal point of scientific and policy discourse. This paper examines the essence of CBDCs as an innovative instrument, representing a digital form of sovereign currency that is a direct liability of the central bank and is denominated in the national unit of account. Unlike commercial bank money and private electronic payment means, CBDCs possess the status of legal tender and are backed by the state, which ensures their high reliability and stability.

The development of CBDCs is driven by a complex set of technological factors. One of the primary prerequisites is the steady trend toward a reduction in the use of physical cash. In several countries, including China and Scandinavian nations, cash is gradually losing its central role in retail payments. In this context, the creation of a CBDC is considered a method to preserve public access to safe state money in the digital sphere. Research indicates that approximately 15 out of 26 studied central banks in emerging markets identify the provision of a digital equivalent to cash as their priority motivation [1].

The technological architecture of a CBDC can be implemented based on centralized ledger management systems or using distributed ledger technology. The choice of a specific technology directly affects the performance, scalability, and privacy level of the system. In the majority of ongoing projects, preference is given to a two-tier distribution model. Within such an architecture, the central bank provides the core infrastructure and handles the issuance of digital tokens, while financial intermediaries, such as commercial banks and payment organizations, deal with end-user services, customer identification, and wallet management [2]. This approach did not only minimize the operational burden on the regulator but also allows the preservation of the established role of commercial banks in the process of financial intermediation and economic lending.

A comparative perspective of CBDCs and cryptocurrencies reveals fundamental differences in their legal nature, price stabilization mechanisms, and governance. Cryptocurrencies, such as Bitcoin or Ethereum, function in decentralized networks without a single issuer or external regulatory system. Their value is determined solely by market supply and demand, which leads to extremely high price volatility, reaching as much as 300 % per year in some periods. In contrast, CBDCs are centrally regulated instruments pegged to the national currency exchange rate, which ensures their predictability for use as a unit of account and a store of value [3].

Unlike cryptocurrencies that prioritize anonymity, CBDCs are designed for regulatory compliance and combating financial crimes, often employing "managed anonymity" to balance privacy with transaction tracking. The implementation of CBDCs offers significant advantages, including enhanced efficiency in domestic and cross-border payments through real-time settlements, potentially saving the global economy up to $100 billion annually. Furthermore, CBDCs provide central banks with advanced monetary policy tools, such as setting interest rates on digital balances, allowing for better inflation management and the potential to overcome interest rate lower bounds [1].

However, CBDC introduction poses serious risks, primarily the threat of banking sector disintermediation, where massive fund outflows could destabilize commercial banks and increase credit costs. Cybersecurity is another critical concern, as centralized systems require robust protection against large-scale attacks and technical failures. Ultimately, CBDCs represent a crucial evolution in money, combining sovereign reliability with digital efficiency. Their successful integration depends on balancing innovation with financial stability, fostering international cooperation for standardization, and maintaining public trust through data privacy and system resilience.

References:

1. Bank for International Settlements papers No 123 CBDCs in emerging market economies : [website]. – [Switzerland], 2022. – URL: https://www.bis.org/publ/bppdf/bispap123.pdf (date of access 17.03.2026).

2. Tiered CBDC and the financial system : [website]. – [Germany], 2020. – URL: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb. wp2351~c8c18bbd60.en.pdf (date of access 17.03.2026).

3. From Cryptocurrencies to CBDCs: A Comparative Perspective on Domestic and Global Digital Payment Systems : [website]. – [USA], 2025. – URL: https://www.academia.edu/145824471/From_Cryptocurrencies_to_CBDCs_A_Comparative_Perspective_on_Domestic_and_Global_Digital_Payment_Systems (date of access 17.03.2026).