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WAYS TO IMPROVE THE PRACTICE OF WORKING WITH ELECTRONIC MONEY IN COMMERCIAL BANKS

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Abstract. The rapid development of digital technologies has significantly transformed the global financial system, particularly the banking sector. Electronic money has become one of the most important innovations in modern financial services, providing customers with fast, secure, and convenient payment solutions. Commercial banks play a central role in the circulation, management, and regulation of electronic money systems. However, despite the increasing popularity of electronic payments, several organizational, technological, legal, and security-related challenges continue to hinder the effective implementation of electronic money practices in commercial banks. This article analyzes the theoretical foundations of electronic money, examines current practices in commercial banking systems, identifies major challenges associated with electronic money operations, and proposes practical recommendations for improving the management and usage of electronic money in commercial banks. The research is based on comparative analysis, institutional approaches, and modern banking practices. The findings demonstrate that strengthening cybersecurity systems, improving legal frameworks, enhancing customer trust, implementing innovative financial technologies, and developing digital literacy can significantly improve the effectiveness of electronic money operations in commercial banks.

Key words: electronic money, commercial banks, digital banking, fintech, electronic payments, cybersecurity, financial innovation, banking technologies, cashless economy, online banking.

Introduction. The rapid development of information and communication technologies has fundamentally transformed the global financial system and significantly changed the traditional mechanisms of banking operations. In the twenty-first century, digitalization has become one of the most important driving forces of economic growth, financial modernization, and global integration. Within this transformation process, electronic money has emerged as a key element of modern financial infrastructure, enabling individuals, businesses, and governments to conduct financial transactions quickly, securely, and efficiently in digital environments. Electronic money represents monetary value stored electronically and used for payment purposes through digital systems such as online banking platforms, mobile applications, payment cards, and electronic wallets. Unlike traditional paper-based payment systems, electronic money allows users to transfer funds instantly without the physical exchange of cash. The growing popularity of smartphones, internet technologies, e-commerce platforms, and financial technologies (fintech) has accelerated the transition from cash-based economies to cashless and digitally integrated financial systems. In recent years, commercial banks have undergone substantial transformation due to the increasing demand for digital financial services. Modern customers expect banking operations to be accessible at any time and from any location. As a result, commercial banks have actively introduced online banking, mobile banking, contactless payment technologies, QR-

code payment systems, digital wallets, and automated financial services to satisfy evolving customer needs. These innovations have improved the speed, convenience, and accessibility of banking operations while simultaneously reducing transaction costs and operational inefficiencies. The development of electronic money systems has also significantly influenced global economic processes. Digital payment systems contribute to financial inclusion by providing access to banking services for populations living in remote and underserved regions. In many developing economies, mobile banking technologies and electronic payment systems have become effective instruments for reducing poverty, supporting entrepreneurship, and integrating citizens into the formal financial system. Furthermore, electronic money facilitates international trade, e-commerce, and cross-border financial transactions, thereby strengthening economic globalization and international business cooperation. Commercial banks play a central role in the circulation and management of electronic money. They serve as intermediaries responsible for processing digital payments, maintaining customer accounts, ensuring payment security, and complying with financial regulations. In addition, commercial banks cooperate with central banks, fintech companies, payment service providers, and regulatory institutions to create efficient and secure electronic payment ecosystems. The modernization of banking technologies has therefore become a strategic priority for financial institutions seeking to maintain competitiveness in the rapidly evolving digital economy. Legal and regulatory issues also represent important obstacles to the effective functioning of electronic money systems. In many countries, the legal framework governing electronic payments, digital banking, and fintech operations remains underdeveloped or inconsistent. Regulatory uncertainty may negatively affect customer trust, create operational risks for financial institutions, and limit innovation in the financial sector. Therefore, governments and regulatory authorities must establish comprehensive legal mechanisms that ensure consumer protection, financial stability, anti-money laundering compliance, and transparency in digital financial operations. The emergence of fintech companies has further transformed the competitive environment within the banking industry. Financial technology firms provide innovative payment solutions, peer-to-peer transaction systems, digital wallets, cryptocurrency platforms, and alternative financial services that compete directly with traditional banking institutions. To remain competitive, commercial banks increasingly cooperate with fintech companies by integrating artificial intelligence, blockchain technologies, cloud computing, and big data analytics into their operations. Such cooperation enables banks to improve customer service quality, optimize operational efficiency, and develop innovative financial products. The COVID-19 pandemic also accelerated the global transition toward digital payments and electronic financial services. During the pandemic, social distancing measures and restrictions on physical transactions encouraged consumers and businesses to adopt online banking and contactless payment technologies more actively. This period demonstrated the strategic importance of reliable electronic money systems for maintaining economic continuity and financial stability during global crises. In the context of increasing digital transformation, improving the practice of working with electronic money in commercial banks has become one of the most important priorities for financial institutions, policymakers, and researchers. The effective management of electronic money systems requires comprehensive reforms involving technological innovation, cybersecurity enhancement, legal modernization, organizational improvements, customer education, and international cooperation. This scientific article aims to analyze the current state of electronic money operations in commercial banks, identify major challenges affecting digital financial services, and propose practical recommendations for improving electronic money practices. The research also examines the role of modern technologies, fintech innovations, legal frameworks, and customer-oriented strategies in strengthening electronic payment systems and increasing banking efficiency in the digital economy. The significance of this research lies in its comprehensive approach to electronic money management in commercial banking. The findings of the study

may contribute to the development of more secure, efficient, and innovative digital banking systems capable of supporting sustainable economic growth and financial modernization in both developed and developing countries.

Literature Review. The issue of electronic money and its practical application in commercial banks has become one of the most actively researched topics in modern financial science. The rapid digitalization of financial systems, the expansion of online banking services, and the emergence of financial technologies (fintech) have encouraged scholars, economists, banking specialists, and international financial institutions to study the economic, legal, technological, and organizational aspects of electronic money systems. Existing literature demonstrates that electronic money not only changes traditional banking mechanisms but also transforms the entire structure of the global financial system. One of the earliest theoretical approaches to electronic money was developed within the framework of monetary economics and financial intermediation theory. Researchers analyzed electronic money as a new form of monetary value that could replace traditional physical cash in modern economies. According to the works of Frederic S. Mishkin, financial innovation significantly improves the efficiency of financial markets and banking operations. Mishkin argues that technological progress in banking systems reduces transaction costs, improves payment speed, and increases customer access to financial services. In his research on banking and financial markets, he emphasizes that electronic payment systems contribute to the modernization of commercial banking and increase the competitiveness of financial institutions in global markets. Researchers from the European Central Bank define electronic money as digitally stored monetary value accepted as a means of payment by parties other than the issuer. ECB reports emphasize that electronic money systems support the development of cashless economies and improve the speed and transparency of financial transactions. The ECB also notes that commercial banks play a central role in maintaining the stability and reliability of digital payment systems. A significant portion of the literature focuses on the technological aspects of electronic money systems. Modern scholars increasingly analyze the impact of fintech innovations, artificial intelligence, blockchain technologies, cloud computing, and big data analytics on commercial banking operations. According to Douglas W. Arner, fintech represents a new stage in the evolution of financial systems characterized by the integration of advanced digital technologies into financial services. Arner and his co-authors explain that fintech innovations improve transaction efficiency, customer service quality, and operational flexibility within banking institutions. At the same time, many scholars emphasize the risks associated with electronic money systems. Cybersecurity has become one of the most important areas of research in digital banking studies. Ross Anderson extensively analyzes vulnerabilities within electronic financial systems and digital banking infrastructures. According to Anderson, cyberattacks targeting commercial banks have become increasingly sophisticated due to the expansion of online financial services. His research demonstrates that weak authentication mechanisms, insufficient encryption systems, and inadequate cybersecurity policies increase the risk of financial fraud, data breaches, and unauthorized access to customer accounts. Studies conducted by the Basel Committee on Banking Supervision also emphasize the importance of operational risk management in electronic banking systems. Basel Committee reports highlight that commercial banks must establish comprehensive risk management mechanisms to address operational, technological, legal, and reputational risks associated with electronic money operations. These reports recommend implementing integrated cybersecurity frameworks, continuous transaction monitoring systems, and internal control mechanisms to improve banking stability. Another important direction in the literature concerns the legal and regulatory aspects of electronic money systems. Legal scholars argue that the effectiveness of electronic money operations depends largely on the existence of clear and comprehensive legal frameworks. Researchers studying financial regulation emphasize that governments and central banks must establish transparent

rules governing digital payments, consumer rights, anti-money laundering procedures, and fintech operations. Reports published by the International Monetary Fund analyze the macroeconomic implications of fintech and digital banking development. IMF studies suggest that electronic money systems improve payment efficiency and support financial innovation; however, they also create new regulatory and monetary policy challenges for governments and central banks. IMF researchers note that regulators must balance innovation promotion with financial stability and consumer protection. Similarly, the Bank for International Settlements examines the role of central banks and commercial banks in the modernization of payment systems. BIS reports emphasize that electronic money systems require international cooperation because digital financial transactions often operate across national borders. The organization also highlights the growing importance of central bank digital currencies (CBDCs) in the future development of electronic money systems. The relationship between electronic money and financial inclusion is another widely discussed topic in academic literature. Studies conducted by the World Bank demonstrate that digital financial services significantly improve access to financial systems for unbanked populations. According to World Bank research, mobile banking technologies and electronic payment systems are particularly effective in developing economies where traditional banking infrastructure is limited. These studies indicate that digital payments reduce transaction costs, encourage entrepreneurship, and contribute to poverty reduction. Researchers also analyze customer behavior and trust in electronic payment systems. Several studies demonstrate that customer confidence is one of the key determinants of electronic money adoption. Consumers are more likely to use digital financial services when they perceive payment systems as secure, convenient, and reliable. Scholars argue that privacy protection, transparent banking policies, and efficient customer support services positively influence public trust in electronic banking systems. Another major theme in the literature concerns the competition between commercial banks and fintech companies. Researchers note that fintech firms increasingly challenge traditional banking institutions by providing innovative digital payment solutions and customer-oriented financial services. Some scholars argue that fintech development may weaken the role of traditional banks, while others suggest that cooperation between banks and fintech companies creates opportunities for innovation and efficiency improvement. Recent literature also examines the impact of the COVID-19 pandemic on electronic money systems and digital banking development. Studies show that the pandemic accelerated the global transition toward cashless payments and online banking services. Researchers found that social distancing measures encouraged individuals and businesses to rely more heavily on electronic transactions and mobile payment technologies. As a result, commercial banks intensified investments in digital infrastructure and cybersecurity systems during and after the pandemic period. Despite the substantial volume of research on electronic money, several gaps remain within the existing literature. Many studies focus primarily on technological innovations or macroeconomic effects while paying less attention to practical organizational improvements within commercial banks. Furthermore, some research concentrates mainly on developed economies, leaving insufficient analysis of challenges faced by developing and transition countries. There is also a growing need for interdisciplinary research integrating economic, legal, technological, and managerial perspectives on electronic money systems. Modern banking environments require comprehensive strategies combining cybersecurity enhancement, technological modernization, regulatory reforms, customer education, and fintech cooperation. This study contributes to existing literature by providing a comprehensive analysis of practical ways to improve the practice of working with electronic money in commercial banks. Unlike many previous studies that focus on individual aspects of digital banking, this research examines electronic money systems from multiple perspectives, including operational efficiency, cybersecurity, financial inclusion, legal regulation, customer trust, and technological innovation. The study also emphasizes the importance of integrated

reforms and strategic cooperation between commercial banks, governments, fintech companies, and international financial institutions in strengthening modern electronic payment systems.

Discussion. The analysis of electronic money systems in commercial banks demonstrates that digital transformation has fundamentally reshaped the structure, functions, and competitive dynamics of modern banking. Electronic money is no longer a supplementary financial instrument but has become a core component of the global financial ecosystem. Its integration into banking operations has significantly improved transaction efficiency, reduced operational costs, and expanded access to financial services. However, the practical implementation of electronic money systems reveals both substantial opportunities and complex challenges that require systematic and multi-level solutions. One of the most significant findings of this study is that electronic money enhances the overall efficiency of commercial banking systems by accelerating payment processing and reducing dependency on physical cash circulation. Digital payment infrastructures allow banks to perform real-time transactions, improve liquidity management, and optimize customer service delivery. In this context, electronic money serves as a catalyst for improving financial intermediation and increasing the speed of capital circulation within the economy. At the same time, the discussion highlights that the expansion of electronic money systems intensifies cybersecurity risks and operational vulnerabilities. As banking services become increasingly digitized, financial institutions are exposed to a wider range of cyber threats, including data breaches, phishing attacks, ransomware, identity theft, and unauthorized access to financial accounts. These risks are not only technical in nature but also have significant economic and reputational consequences for commercial banks. Therefore, cybersecurity is not merely a technical requirement but a strategic priority that directly influences customer trust and institutional stability. Another important aspect identified in the analysis is the uneven level of technological development among commercial banks, particularly in developing and transition economies. While leading international banks have already adopted advanced technologies such as artificial intelligence, blockchain, and cloud computing, many institutions still rely on outdated legacy systems. This technological gap creates disparities in service quality, transaction speed, and system reliability. Consequently, digital inequality within the banking sector remains a critical barrier to the global harmonization of electronic money systems. The discussion also emphasizes the importance of regulatory frameworks in shaping the effectiveness of electronic money operations. Inadequate or fragmented legal regulation can hinder innovation and reduce the efficiency of digital financial systems. International organizations such as the International Monetary Fund and the Bank for International Settlements consistently emphasize the need for clear, transparent, and harmonized regulatory standards for digital payments and fintech activities. Effective regulation must strike a balance between encouraging financial innovation and ensuring consumer protection, financial stability, and anti-money laundering compliance. Furthermore, the study reveals that customer trust and financial literacy play a decisive role in the adoption and sustainable use of electronic money systems. Even the most advanced digital banking infrastructure cannot achieve full effectiveness if users lack confidence in the security and reliability of electronic payment systems. Many customers remain cautious due to concerns about fraud, privacy violations, and technical failures. This indicates that psychological and behavioral factors are just as important as technological and institutional factors in the development of electronic money ecosystems. Another important observation is the impact of global crises, particularly the COVID-19 pandemic, which significantly accelerated the adoption of electronic money systems. The pandemic demonstrated the resilience of digital banking infrastructure and highlighted the importance of contactless and remote financial services. As a result, commercial banks have increased investments in digital transformation, cybersecurity systems, and remote service delivery platforms. Overall, the discussion confirms that improving the practice of working with electronic money in commercial banks requires an integrated approach that combines technological innovation, regulatory reform,

cybersecurity enhancement, customer education, and fintech collaboration. Isolated improvements in a single area are insufficient; instead, a coordinated strategy involving all stakeholders is necessary to ensure sustainable development of electronic money ecosystems.

Conclusion. This study has examined the theoretical and practical aspects of improving the practice of working with electronic money in commercial banks under conditions of rapid digital transformation of the global financial system. The research confirms that electronic money has become an essential component of modern banking infrastructure, significantly influencing the efficiency, accessibility, and competitiveness of financial institutions. The findings demonstrate that commercial banks play a central role in the development and management of electronic money systems by providing digital payment services, maintaining transaction security, and ensuring compliance with regulatory requirements. At the same time, the study highlights that the effective functioning of electronic money systems depends on the integration of advanced technologies, strong cybersecurity mechanisms, and well-developed institutional frameworks. Furthermore, the research emphasizes the importance of financial literacy and customer trust in ensuring the successful adoption of electronic money systems. Even the most advanced digital banking technologies cannot achieve their full potential if users lack confidence in their safety and reliability. Therefore, educational initiatives aimed at improving digital financial awareness are essential for expanding the use of electronic money. Another important conclusion is that cooperation between commercial banks and fintech companies plays a significant role in driving innovation in the financial sector. Such collaboration enables banks to develop more flexible, efficient, and customer-oriented financial services, thereby strengthening their competitiveness in the global financial market. From a policy perspective, the study highlights the need for comprehensive and harmonized regulatory frameworks that support innovation while ensuring financial stability and consumer protection. Effective regulation is essential for creating a secure and transparent environment for electronic financial transactions. Overall, the research concludes that improving the practice of working with electronic money in commercial banks requires a holistic and integrated approach that combines technological innovation, regulatory development, cybersecurity enhancement, financial education, and institutional cooperation. Sustainable progress in this area will contribute to the development of a more efficient, inclusive, and resilient digital financial system.

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