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Mechanisms of Money Creation in the Digital Economy: Endogenous Monetary Theory and Theoretical Analysis of Digital Currency Systems

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Abstract. *The rapid development of cryptocurrencies and Central Bank Digital Currencies has revived debates concerning the mechanisms of money issuance and the relevance of traditional monetary theories. This study examines money creation in the digital age through the perspectives of Endogenous Money Theory, the Quantity Theory of Money, and emerging digital currency systems. The findings indicate that while commercial bank lending remains the primary mechanism of money creation, digital currencies have introduced additional channels that operate alongside the traditional banking system. To explain this transformation, the study proposes a Three-Tier Model of Money Creation consisting of sovereign money, credit-based money, and decentralized digital money. The analysis suggests that future monetary systems are likely to evolve toward a hybrid architecture in which Central Bank Digital Currencies, cryptocurrencies, commercial bank money, and central bank money coexist. The study contributes to the literature by extending Endogenous Money Theory to digital currency environments and providing a broader theoretical framework for understanding contemporary money creation mechanisms.*

Keywords: *endogenous money theory, digital currencies, central bank digital currency, cryptocurrencies, monetary sovereignty, quantity theory of money*

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Rəqəmsal iqtisadiyyatda pulun yaradılması mexanizmləri: endogen pul nəzəriyyəsi və rəqəmsal valyuta sistemlərinin nəzəri təhlili

Günay Musayeva

Xülasə. *Məqalədə əsas diqqət yetirilən məsələ bundan ibarətfit ki, kriptovalyutaların və Mərkəzi Bank Rəqəmsal Valyutalarının sürətli inkişafı pulun emissiyası mexanizmi və ənənəvi monetar nəzəriyyələrin aktuallığı ilə bağlı müzakirələri yenidən gündəmə gətirmişdir. Bu tədqiqat rəqəmsal dövrdə pul yaradılmasını endogen pul nəzəriyyəsi, Pulun Kəmiyyət Nəzəriyyəsi və yeni formalaşan rəqəmsal valyuta sistemləri prizmasından araşdırır. Nəticələr göstərir ki, kommersiya banklarının kredit fəaliyyəti pul yaradılmasının əsas mexanizmi olaraq qalmaqda davam etsə də, rəqəmsal valyutalar ənənəvi bank sisteminə paralel fəaliyyət göstərən əlavə pul yaradılması kanalları formalaşdırır.*

Bu transformasiyanı izah etmək məqsədilə tədqiqatda suveren pul, kredit əsaslı pul və mərkəzsizləşdirilmiş rəqəmsal puldan ibarət olan Pul Yaradılmasının Üçsəviyyəli Modeli təklif olunur. Təhlil göstərir ki, gələcək monetar sistemlər Mərkəzi Bank Rəqəmsal Valyutalarının, kriptovalyutaların, kommersiya bankı pullarının və mərkəzi bank pullarının birgə mövcud olduğu hibrid arxitekturaya doğru inkişaf edəcəkdir. Tədqiqat endogen pul nəzəriyyəsinin rəqəmsal valyuta mühitinə uyğunlaşdırılması və müasir pul yaradılması mexanizmlərinin daha geniş nəzəri çərçivədə izah edilməsi baxımından mövcud ədəbiyyata töhfə verir.

Açar sözlər: *endogen pul nəzəriyyəsi, rəqəmsal valyutalar, mərkəzi bank rəqəmsal valyutası, kriptovalyutalar, monetar suverenlik, pulun kəmiyyət nəzəriyyəsi*

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Introduction

Money creation has long been a central issue in monetary economics. Traditional approaches, particularly the Quantity Theory of Money (QTM), view money supply as an exogenous variable controlled by central banks through monetary policy instruments. In contrast, endogenous money theory argues that money is primarily created through commercial bank lending, with central banks influencing this process indirectly through interest rates and regulatory frameworks (Gross & Siebenbrunner, 2019; Kuypers et al., 2021).

The emergence of digital currencies has intensified this debate. Cryptocurrencies have introduced decentralized forms of money that operate outside conventional banking structures (Bibi, 2023; Scheau et al., 2020), while Central Bank Digital Currencies (CBDCs) represent a new form of sovereign digital money designed to enhance payment efficiency, financial inclusion, and monetary sovereignty (Auer et al., 2021; Guo et al., 2025). These developments raise important questions about whether existing theories of money creation remain adequate in an increasingly digitalized monetary environment.

Although a growing body of research examines cryptocurrencies, CBDCs, and their monetary implications (Vinuela et al., 2020; Cunha et al., 2021; Luo et al., 2021; Helmi et al., 2023), the literature remains fragmented. Most studies focus on technological characteristics, financial market effects, or monetary policy issues, while limited attention has been devoted to integrating digital currency developments with endogenous money theory. Consequently, a comprehensive theoretical explanation of money creation in systems where commercial bank money, cryptocurrencies, and CBDCs coexist is still lacking.

To address this gap, this article synthesizes insights from monetary economics, endogenous money theory, cryptocurrency studies, and CBDC research to examine the evolving nature of money creation in the digital age. The study is guided by two research questions:

RQ1: How do cryptocurrencies and CBDCs challenge traditional and endogenous theories of money creation?
RQ2: What are the implications of digital currency systems for the future of monetary creation and monetary sovereignty?

The primary objective of the article is to develop a theoretical understanding of money creation mechanisms in digital monetary systems by comparing fiat money, bank-created money, cryptocurrencies, and CBDCs. Through a conceptual analysis, the study evaluates whether digital currencies represent an extension of existing monetary arrangements or a fundamental transformation of the monetary system.

The article contributes to the literature in three ways. First, it integrates previously disconnected research streams on endogenous money, cryptocurrencies, and CBDCs into a unified analytical framework. Second, it reassesses the relevance of the Quantity Theory of Money in digital monetary environments. Third, it develops a conceptual model that explains the evolving relationships among central banks, commercial banks, and digital currency systems.

The remainder of the article is organized as follows. Section 2 reviews the theoretical foundations of money creation and digital currencies. Section 3 outlines the conceptual review methodology. Section 4 presents the theoretical synthesis and conceptual framework. Section 5 discusses the implications for monetary theory and policy, while Section 6 concludes and identifies directions for future research.

Literature Review

2.1. Quantity Theory of Money and Money Creation

The Quantity Theory of Money (QTM) views money supply as an exogenous variable controlled by central banks and assumes a close relationship between monetary aggregates, prices, and economic activity. However, financial innovation and digitalization have weakened the stability of this relationship, raising questions about the continued explanatory power of traditional monetary models (Focacci & Focacci, 2024; Kumar et al., 2025). The emergence of digital currencies further challenges the assumption that central banks exercise exclusive control over money creation.

2.2. Endogenous Money Theory

Endogenous money theory argues that money is primarily created through commercial bank lending rather than direct central bank actions. According to this perspective, loans create deposits, making money supply responsive to credit demand (Gross & Siebenbrunner, 2019). Recent studies support the central role of bank credit in money creation while also suggesting that macroeconomic conditions and financial structures may influence the effectiveness of endogenous money mechanisms (Kuypers et al., 2021; Metelski & Sobieraj, 2026).

2.3. Cryptocurrencies as Alternative Monetary Systems

Cryptocurrencies have introduced decentralized forms of digital money that operate independently of traditional banking systems. By enabling value transfer outside state-controlled monetary structures, they challenge conventional assumptions regarding money creation and monetary sovereignty (Bibi, 2023). The growing diversity of digital assets, including stablecoins and tokenized assets, has expanded alternative monetary arrangements and increased competition with traditional forms of money (Scheau et al., 2020). At the same time, their volatility and interconnectedness raise concerns regarding financial stability (Ferreira & Pereira, 2019).

2.4. CBDCs and the Future of Monetary Sovereignty

In response to the rise of private digital currencies, central banks have accelerated the development of Central Bank Digital Currencies (CBDCs). CBDCs combine the credibility of sovereign money with the efficiency of digital payment systems and may strengthen monetary policy transmission while preserving monetary sovereignty (Vinuela et al., 2020; Cunha et al., 2021). However, widespread CBDC adoption could alter traditional bank-based money creation by affecting

commercial bank deposits and lending capacity (Auer et al., 2021). Consequently, CBDCs represent both an innovation in sovereign money and a potential transformation of existing monetary structures (Guo et al., 2025; Luo et al., 2021).

Overall, the literature suggests that digital currencies are reshaping traditional understandings of money creation. While endogenous money theory continues to explain the dominant role of bank credit, cryptocurrencies and CBDCs introduce new mechanisms that require a broader theoretical framework for understanding money creation in the digital age.

Methods

3.1. Research Design

This study employs a qualitative conceptual research design based on an integrative literature review. Rather than relying on primary data, the study synthesizes existing theoretical perspectives to examine money creation mechanisms in the digital age. This approach is particularly appropriate given the evolving nature of cryptocurrencies and Central Bank Digital Currencies (CBDCs) and the fragmented literature spanning monetary economics, banking, and digital finance. Through a systematic synthesis of these research streams, the study develops a theoretical framework for understanding money creation in contemporary digital monetary systems.

3.2. Data Sources and Literature Selection

The theoretical analysis is based on peer-reviewed journal articles, working papers, and institutional publications addressing money creation, endogenous money theory, cryptocurrencies, central bank digital currencies, and monetary policy. The literature was selected according to its theoretical relevance to the study's research questions rather than through strict bibliometric criteria.

Results

Theoretical Synthesis and Conceptual Framework

The literature suggests that digitalization is transforming money creation from a predominantly bank-centered process into a multi-source monetary ecosystem. While traditional monetary theory emphasizes central bank control and endogenous money theory highlights commercial bank lending, digital currencies introduce additional channels of monetary creation that operate beyond conventional banking structures.

Based on the reviewed literature, this study proposes a Three-Tier Model of Money Creation. The first tier consists of sovereign money, including cash, reserves, and CBDCs issued by central banks. The second tier comprises credit-based money created through commercial bank lending, which remains the dominant source of money creation in modern economies. The third tier includes decentralized digital money, such as cryptocurrencies, generated through algorithmic and blockchain-based mechanisms.

The analysis indicates that digital currencies do not replace existing money creation mechanisms but coexist with them. CBDCs strengthen the digital presence of sovereign money, whereas cryptocurrencies create parallel monetary networks operating outside traditional banking systems. As a result, contemporary monetary systems increasingly combine public, private, and decentralized forms of money.

The findings further suggest that endogenous money theory remains highly relevant because bank lending continues to drive money supply expansion. However, the emergence of CBDCs, cryptocurrencies, and stablecoins requires extending the theory beyond its traditional focus on

commercial banks. Similarly, digital currencies expose limitations of the Quantity Theory of Money by complicating the definition of money supply and weakening the relationship between conventional monetary aggregates and economic activity.

Overall, the study argues that future monetary systems are likely to evolve toward a hybrid monetary architecture in which sovereign money, commercial bank money, CBDCs, and digital assets coexist. Consequently, understanding money creation in the digital age requires moving beyond the traditional exogenous–endogenous dichotomy and adopting a broader ecosystem perspective that incorporates multiple sources of monetary creation.

Discussion

5.1. Money Creation in the Digital Age

The findings provide direct answers to the two research questions. Regarding RQ1, cryptocurrencies and CBDCs challenge both the Quantity Theory of Money and traditional endogenous money theory by introducing additional channels of money creation that operate alongside central bank money and commercial bank credit. Regarding RQ2, the results suggest that future monetary systems are likely to evolve toward hybrid structures in which sovereign money, bank-created money, and decentralized digital assets coexist, requiring new approaches to monetary governance and sovereignty.

5.2. The Relevance of Endogenous Money Theory

Despite the rise of digital currencies, endogenous money theory remains highly relevant, as commercial bank lending continues to be the primary source of money creation. However, cryptocurrencies, stablecoins, and CBDCs expand the monetary landscape and require a broader interpretation of money creation mechanisms. Rather than replacing endogenous money theory, digital currencies extend its scope and highlight the need for a more comprehensive framework capable of explaining both traditional and digital forms of money.

5.3. Digital Currencies and Monetary Sovereignty

Digital currencies are reshaping traditional notions of monetary sovereignty. While cryptocurrencies introduce privately generated forms of money outside direct government control, CBDCs represent a policy response aimed at preserving the role of central banks in digital economies. The findings suggest that future monetary sovereignty will depend not only on money issuance but also on the ability of public institutions to regulate and coordinate multiple forms of money within integrated financial ecosystems.

5.4. Quantity Theory of Money in the Digital Era

The findings indicate that digital currencies expose important limitations of the Quantity Theory of Money. The growing diversity of monetary instruments, including cryptocurrencies, CBDCs, and stablecoins, complicates the measurement of money supply and weakens the traditional relationship between monetary aggregates and economic activity. Nevertheless, rather than rejecting the Quantity Theory entirely, the results suggest the need to adapt it to increasingly complex and digitalized monetary systems by integrating insights from both quantity-based and endogenous money approaches.

5.5. Implications of the Three-Tier Model

The proposed Three-Tier Model suggests that money creation in the digital age is increasingly characterized by the coexistence of sovereign money, credit-based money, and decentralized digital money. By moving beyond the traditional exogenous–endogenous distinction, the model provides a broader framework for understanding the interaction of public, private, and digital forms of money within contemporary monetary systems.

5.6. Theoretical Contributions and Future Research

This study contributes to the literature by integrating endogenous money theory, cryptocurrencies, and CBDCs into a unified conceptual framework. It further proposes a Three-Tier Model of Money Creation and reassesses the relevance of the Quantity Theory of Money in digital environments. Future research should empirically examine the effects of CBDCs, stablecoins, and decentralized finance on bank lending, monetary sovereignty, and monetary policy effectiveness. As digital currencies continue to expand, understanding the interaction between traditional and digital forms of money will remain an important research agenda.

Conclusion

This study examined money creation in the digital age through the perspectives of endogenous money theory, cryptocurrencies, and Central Bank Digital Currencies (CBDCs). The findings suggest that neither the Quantity Theory of Money nor traditional endogenous money theory alone can fully explain contemporary monetary systems. While commercial bank lending remains the dominant source of money creation, digital currencies have introduced new channels that operate alongside traditional banking mechanisms.

The study argues that modern monetary systems are evolving toward a hybrid structure in which sovereign money, commercial bank money, CBDCs, and cryptocurrencies coexist. To explain this transformation, a Three-Tier Model of Money Creation was proposed, integrating sovereign, credit-based, and decentralized forms of money creation within a single framework.

Theoretically, the study extends endogenous money theory to digital currency environments and highlights the limitations of conventional monetary approaches in increasingly digitalized economies. Overall, the findings indicate that understanding future monetary systems requires moving beyond the traditional exogenous–endogenous debate and adopting a broader perspective that recognizes multiple sources of money creation and monetary governance.

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