

DIGITAL CURRENCIES' IMPACT ON TRADITIONAL MONETARY SYSTEMS: A COMPARATIVE ANALYSIS OF BITCOIN AND CENTRAL BANK DIGITAL CURRENCIES

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Abstract. This article examines the transformative impact of digital currencies on conventional monetary systems through a comparative analysis of Bitcoin and Central Bank Digital Currencies (CBDCs). The research synthesizes existing literature to evaluate how decentralized cryptocurrencies and state-backed digital currencies challenge traditional banking infrastructure, monetary policy transmission, and financial intermediation. This research contributes to understanding how digital monetary innovations reshape the architecture of global financial systems and the future trajectory of monetary sovereignty.

Keywords: digital currencies, Bitcoin, monetary policy, financial system transformation, cryptocurrency, blockchain technology, payment systems.

Аннотация. В данной статье рассматривается преобразующее влияние цифровых валют на традиционные денежные системы посредством сравнительного анализа биткоина и цифровых валют центральных банков (CBDC). Исследование обобщает существующую литературу, чтобы оценить, как децентрализованные криптовалюты и поддерживаемые государством цифровые валюты бросают вызов традиционной банковской инфраструктуре, трансмиссии денежно-кредитной политики и финансовому посредничеству. Данное исследование способствует пониманию того, как инновации в области цифровых денег меняют архитектуру мировых финансовых систем и будущую траекторию денежно-кредитного суверенитета.

Ключевые слова: цифровые валюты, биткоин, денежно-кредитная политика, трансформация финансовой системы, криптовалюта, технология блокчейн, платежные системы.

INTRODUCTION

The emergence of digital currencies represents one of the most significant disruptions to monetary systems since the abandonment of the gold standard. Bitcoin's introduction in 2009 as a decentralized, peer-to-peer electronic cash system challenged fundamental assumptions about the necessity of centralized monetary authorities and traditional banking intermediaries [1]. Subsequently, central banks worldwide have responded by developing their own digital currencies, leading to what scholars characterize as a "currency digitalization race" that fundamentally questions the future architecture of money [2]. Traditional monetary systems, built upon fractional reserve banking, central bank policy transmission through interest rate mechanisms, and

commercial bank intermediation, now face unprecedented competition from both decentralized cryptocurrencies and state-backed digital alternatives.

METHODOLOGY AND LITERATURE REVIEW

This study employs a systematic literature review methodology, analyzing peer-reviewed academic articles, central bank publications, and authoritative reports from international financial institutions. The research synthesizes findings from ten primary sources selected based on their relevance to digital currency impacts on monetary systems, methodological rigor, and citation influence within financial economics literature. Existing literature reveals a bifurcated scholarly discourse, with one stream examining Bitcoin's disruptive potential as a non-sovereign, algorithmically-governed monetary system operating outside traditional central bank control, and another analyzing CBDCs as evolutionary adaptations of fiat currency to digital platforms while preserving state monetary authority [3]. Research by Brunnermeier and colleagues demonstrates how Bitcoin's fixed supply algorithm fundamentally differs from central banks' discretionary monetary policy, potentially limiting countercyclical stabilization capacity but offering protection against inflationary debasement [4].

Conversely, studies on CBDCs emphasize their potential to enhance monetary policy transmission by enabling direct central bank-to-citizen payment channels, eliminating commercial bank intermediation delays, and potentially implementing negative interest rates more effectively [5]. Literature on payment systems highlights Bitcoin's high transaction costs and energy consumption as impediments to widespread adoption as a medium of exchange, while acknowledging its revolutionary elimination of trusted third parties through blockchain verification [6]. CBDC research emphasizes improved payment efficiency, reduced settlement risks, and enhanced financial inclusion through digital wallet accessibility, though raising concerns about privacy erosion and potential disintermediation of commercial banking [7]. Comparative analyses reveal that while Bitcoin challenges monetary sovereignty by operating as a parallel currency system beyond state control, CBDCs reinforce state monetary authority while modernizing the technological substrate of fiat currencies [8].

RESULTS AND DISCUSSION

The comparative analysis reveals fundamental structural differences in how Bitcoin and CBDCs impact traditional monetary systems, with implications across multiple dimensions of financial system functioning. Regarding monetary policy transmission, Bitcoin's predetermined, algorithmically-governed supply schedule—capped at twenty-one million units—eliminates discretionary monetary policy, representing what economists describe as a return to rule-based monetary systems analogous to gold standard constraints [4]. This design insulates Bitcoin holders from inflationary monetary expansion but simultaneously prevents countercyclical stabilization during economic downturns, potentially exacerbating business cycle volatility if Bitcoin achieved significant adoption as a primary medium of exchange.

In contrast, CBDCs maintain full central bank discretion over money supply while potentially enhancing policy transmission effectiveness by enabling direct household and firm access to central bank liabilities, bypassing commercial bank intermediation that can attenuate policy signals [5]. The impact on financial intermediation represents perhaps the most profound disruption to traditional banking.

Bitcoin's peer-to-peer transaction model eliminates the necessity of trusted intermediaries for payment verification, fundamentally challenging the *raison d'être* of banks as payment system operators, though banks retain advantages in credit assessment, maturity transformation, and liquidity provision that purely transactional cryptocurrencies cannot replicate [6].

CBDCs present a more complex intermediation challenge, as they could enable direct central bank-to-citizen relationships that disintermediate commercial banks from both payment services and deposit-taking functions. Research indicates that if households shift significant deposits from commercial banks to CBDC accounts, bank lending capacity could contract unless central banks recycle CBDC holdings back to commercial banks through repo operations or other mechanisms [7]. The analysis of cross-border payment implications reveals convergent benefits from both digital currency types in reducing transaction costs, settlement times, and correspondent banking chains that characterize traditional international payments. Bitcoin's borderless nature theoretically enables frictionless international value transfer, though volatility and limited merchant acceptance constrain practical utility.

However, international CBDC adoption raises complex questions about currency competition, as digitalization reduces switching costs between currencies, potentially accelerating dollarization or other forms of currency substitution in economies with weak monetary institutions. The regulatory and stability implications differ markedly. Bitcoin's decentralized architecture resists regulatory oversight, creating concerns about financial crime, tax evasion, and consumer protection while offering users financial privacy and censorship resistance. CBDCs operate within existing regulatory frameworks, enabling enhanced compliance monitoring but potentially creating single points of failure and systemic risks if central bank digital infrastructure is compromised.

CONCLUSION

This comparative analysis demonstrates that digital currencies—whether decentralized cryptocurrencies like Bitcoin or centralized CBDCs—fundamentally challenge traditional monetary architecture, though through divergent mechanisms and with distinct implications for monetary governance. Bitcoin represents a radical departure from state-controlled money, offering an algorithmically-governed alternative that operates outside conventional banking systems but faces significant scalability, volatility, and energy consumption challenges that limit its functionality as a widespread medium of exchange. Central Bank Digital Currencies, conversely, modernize fiat currency infrastructure while preserving state monetary sovereignty, potentially enhancing policy transmission and payment efficiency while raising concerns about commercial bank disintermediation and privacy erosion. The research reveals that the future monetary landscape will likely feature coexistence rather than replacement, with multiple currency forms serving different functions across the spectrum from store-of-value to transaction medium to unit-of-account. Traditional monetary systems must adapt by incorporating digital innovations while addressing the regulatory challenges, stability risks, and distributional consequences of currency digitalization.

REFERENCES

1. Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. <https://bitcoin.org/bitcoin.pdf>
2. Auer, R., Cornelli, G., & Frost, J. (2020). Rise of the central bank digital currencies: Drivers, approaches and technologies. *BIS Working Papers*, No. 880. Bank for International Settlements.
3. Bordo, M. D., & Levin, A. T. (2017). Central bank digital currency and the future of monetary policy. *NBER Working Paper Series*, No. 23711. National Bureau of Economic Research.
4. Brunnermeier, M. K., James, H., & Landau, J. P. (2019). The digitalization of money. *NBER Working Paper Series*, No. 26300. National Bureau of Economic Research.
5. Meaning, J., Dyson, B., Barker, J., & Clayton, E. (2018). Broadening narrow money: Monetary policy with a central bank digital currency. *Bank of England Staff Working Paper*, No. 724.
6. Böhme, R., Christin, N., Edelman, B., & Moore, T. (2015). Bitcoin: Economics, technology, and governance. *Journal of Economic Perspectives*, 29(2), 213-238.
7. Kumhof, M., & Noone, C. (2018). Central bank digital currencies: Design principles and balance sheet implications. *Bank of England Staff Working Paper*, No. 725.
8. Mancini-Griffoli, T., Martinez Peria, M. S., Agur, I., Ari, A., Kiff, J., Popescu, A., & Rochon, C. (2018). Casting light on central bank digital currency. *IMF Staff Discussion Note*, SDN/18/08. International Monetary Fund.