

MONEY OR DIGITAL MONEY: TO BE OR NOT TO BE?

Valentin Gabriel CRISTEA *

Abstract

The emergence of digital currencies has sparked debates about the future of money, raising questions about the viability of traditional currencies in an increasingly digital world. In this article, we delve into the evolving landscape of money, exploring the advantages and challenges of digital currencies and their potential impact on traditional financial systems. Through a detailed analysis, we aim to provide insights into the prospects of digital money and its implications for society, economy, and financial institutions, focusing on case studies from Germany, France, the UK, and the USA.

The advancements in technology, particularly in fields such as cryptography, computer science, and networking, have played a pivotal role in shaping the very essence of money. Breakthroughs like cryptographic hashing, public-key cryptography, and peer-to-peer networking have served as the cornerstone for the emergence of digital currencies and blockchain-based platforms. These technological strides have democratised access to financial services, fostering inclusivity and granting individuals unprecedented control over their financial affairs.

In essence, the historical narrative surrounding the evolution of money underscores its timeless significance as a cornerstone of human civilization. From the rudimentary barter systems of ancient societies to the cutting-edge digital currencies of today, money has continually adapted to meet the evolving needs of society and leverage the latest technological innovations. As we navigate the complexities of the digital era, a deep understanding of money's historical origins provides invaluable insights into its future trajectory and the transformative potential inherent in digital currencies.

Keywords: Cryptocurrencies, trends, digital currency, digital banks, market dynamics, financial markets.

1. Introduction

In an age characterised by rapid technological advancement and digital transformation, the concept of money is undergoing a profound evolution. From its traditional forms of coins and banknotes to the emergence of digital currencies, money has transcended physical boundaries and assumed new digital identities. In this introductory discourse, we embark on a journey to explore the intricate interplay between the timeless concept of money and the disruptive innovations of digital currencies.

1.1. Overview of the evolving concept of money

Money, as a medium of exchange, unit of account, and store of value, has been a fundamental pillar of human civilization for millennia. Its evolution reflects the changing needs, values, and aspirations of societies across time and space. However, the advent of digital technologies has ushered in a new era of financial innovation, challenging conventional notions of money and reshaping the global financial landscape.

1.2. Introduction to digital currencies¹ and their growing popularity

At the forefront of this transformation are digital currencies, decentralised forms of money that exist purely in digital form and operate independently of central authorities. Led by pioneering technologies such as blockchain² and distributed ledger technology (DLT), digital currencies promise to revolutionise the way we transact, store value, and conceptualise wealth. Bitcoin, the first and most well-known digital currency, captured the world's imagination with its decentralised nature, limited supply, and potential to disrupt traditional financial systems.

* Degree I, Mathematics Teacher, Ulmi Secondary School, Brănești Secondary School (e-mail: valigabi.cristea@gmail.com).

¹ D.K.C. Lee, L. Yan, Y. Wang, *A global perspective on central bank digital currency*, China Econ. J. 14 (1), 2021a., p. 52-66.

² Y. Lee, B. Son, S. Park, J. Lee, H. Jang, *A survey on security and privacy in blockchain-based central bank digital currencies*, J. Internet Serv. Inf. Secur. 11 (3), 2021b., p. 16-29.

1.3. Significance of exploring the future of money in the digital age

The growing popularity of digital currencies underscores the need to critically examine their implications for the future of money in the digital age. As digital currencies gain traction among consumers, businesses, and governments, questions arise about their impact on financial stability, monetary policy, and the broader economy. Moreover, the rise of digital currencies raises fundamental questions about the nature of money itself, challenging long standing assumptions about its functions, properties, and societal significance.

Against this backdrop, exploring the future of money in the digital age takes on heightened importance. It is not merely a theoretical exercise or speculative endeavor but a pressing imperative for policymakers, economists, technologists, and society at large. Understanding the opportunities and challenges presented by digital currencies requires a multidisciplinary approach that encompasses economics, finance, technology, law, and ethics. By critically examining the evolving concept of money and the disruptive innovations of digital currencies, we can gain valuable insights into the future of finance and shape a more inclusive, efficient, and resilient financial system for generations to come.

2. Historical perspective

2.1. Brief history of money and its evolution over time

Money, as we understand it today, has traversed a fascinating journey throughout human civilization, evolving in response to societal needs, technological advancements, and economic imperatives. This historical narrative unveils the intricate tapestry of money's evolution, from its rudimentary origins to the digital currencies of the modern era, all shaped by the relentless march of innovation.

The concept of money predates recorded history, with early human societies resorting to primitive forms of barter to facilitate trade. Goods and commodities such as grain, livestock, and precious metals served as mediums of exchange, enabling individuals to exchange surplus resources for desired goods and services. However, the inherent limitations of barter, including the lack of divisibility, portability, and uniformity, necessitated the emergence of more sophisticated forms of money.

The advent of coinage in ancient civilizations marked a pivotal milestone in the evolution of money. From the Lydian staters of ancient Greece to the Roman denarii, metallic coins standardised weights and measures, facilitating commerce and fostering economic growth. Coins, stamped with sovereign emblems and intrinsic value, symbolised state authority and became ubiquitous symbols of wealth and power.

2.2. Emergence of digital currencies and their predecessors

As societies evolved and trade expanded, paper money emerged as a complement to metallic coins, offering greater convenience and flexibility in transactions. The earliest forms of paper money, issued by Chinese merchants and banks during the Tang Dynasty, represented promissory notes redeemable for precious metals. Over time, governments began issuing paper currencies backed by reserves of gold or silver, laying the foundation for modern fiat currencies.

The advent of digital currencies represents the latest chapter in the saga of money's evolution, propelled by the transformative potential of digital technologies. The precursors to digital currencies, such as electronic funds transfers (EFTs) and digital payment systems, laid the groundwork for the digitization of money. However, it was not until the emergence of Bitcoin in 2008 that the concept of decentralised digital currencies gained widespread attention.

2.3. Role of technological advancements in shaping the concept of money

Bitcoin³, introduced by the pseudonymous Satoshi Nakamoto, pioneered the use of blockchain technology to create a peer-to-peer electronic cash system. Blockchain, a distributed ledger maintained by a network of computers, enables secure and transparent transactions without the need for intermediaries. Bitcoin's decentralised nature, fixed supply, and cryptographic security challenged conventional notions of money and ignited a global phenomenon.

³ S. Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System*, 2008, retrieved from <https://bitcoin.org/bitcoin.pdf>.

The role of technological advancements, particularly in cryptography, computer science, and networking, has been instrumental in shaping the concept of money. Innovations such as cryptographic hashing, public-key cryptography, and peer-to-peer networking have enabled the development of digital currencies and blockchain-based platforms. These technological breakthroughs have democratised access to financial services, fostered financial inclusion, and empowered individuals to control their finances in unprecedented ways.

In conclusion, the historical perspective on money's evolution underscores its enduring importance as a fundamental pillar of human civilization. From the barter economies of ancient times to the digital currencies of the modern era, money has adapted and transformed in response to changing societal needs and technological innovations. As we navigate the complexities of the digital age, understanding the historical roots of money provides valuable insights into its future trajectory and the transformative potential of digital currencies.

3. Advantages of Digital Money. Financial Sovereignty and Control

Digital currencies empower individuals to have complete control over their finances, free from the constraints of traditional banking systems. With digital wallets and decentralised platforms, users can manage their funds directly, without reliance on intermediaries or financial institutions. This newfound financial sovereignty allows individuals to transact, save, and invest with greater autonomy and flexibility, enhancing their financial well-being and empowerment.

3.1. Accessibility and inclusivity: Digital currencies offer greater accessibility to financial services, particularly for underserved populations. Borderless Transactions and Global Connectivity

Digital currencies facilitate seamless cross-border transactions, enabling individuals and businesses to transact with counterparts around the world without the need for intermediaries or currency conversions. By eliminating barriers such as exchange rates, transaction fees, and processing delays, digital currencies promote global connectivity and foster international trade, investment, and remittances. This borderless nature of digital money opens up new opportunities for economic growth, cooperation, and collaboration on a global scale.

3.2. Efficiency and cost-effectiveness: Digital transactions are faster, cheaper, and more convenient compared to traditional banking methods. Programmable Money and Smart Contracts

Digital currencies are programmable by nature, allowing developers to create smart contracts and decentralised applications (DApps) that automate and enforce the execution of predefined agreements or transactions. Smart contracts enable a wide range of use cases, including escrow services, crowdfunding, supply chain management, and decentralised finance (DeFi). By automating trustless transactions and eliminating the need for intermediaries, programmable money enhances efficiency, reduces costs, and expands the possibilities for innovation in financial services.

3.3. Security and transparency: Blockchain technology ensures secure and transparent transactions, reducing the risk of fraud and counterfeiting. Financial Inclusion and Empowerment

Digital currencies have the potential to promote financial inclusion by providing access to financial services for underserved populations, including the unbanked and underbanked. With the proliferation of mobile phones and internet connectivity, individuals in remote or marginalised communities can access digital wallets and participate in the global economy. Moreover, the low barriers to entry and minimal account requirements of digital currency platforms make it easier for individuals to open and use accounts, regardless of their socioeconomic status or geographic location.

3.4. Innovation and decentralisation: Digital currencies enable innovation in financial services and promote decentralisation, empowering individuals to control their finances

Decentralised Finance (DeFi) Ecosystem: Digital currencies are driving the emergence of decentralised finance (DeFi) ecosystems, comprising a diverse array of blockchain-based applications, protocols, and financial instruments. DeFi platforms enable users to access a wide range of financial services, including lending, borrowing, trading, asset management, and derivatives, without relying on traditional financial intermediaries. By leveraging blockchain technology and smart contracts, DeFi ecosystems offer greater transparency, efficiency,

and accessibility compared to traditional financial systems, fostering innovation and democratising access to financial services for all.

In conclusion, the new advantages of digital money underscore its transformative potential to revolutionise the financial landscape and empower individuals worldwide. From promoting financial sovereignty and global connectivity to enabling programmable money and decentralised finance, digital currencies offer unprecedented opportunities for innovation, inclusion, and empowerment in the digital age. As the adoption of digital money continues to accelerate, it is imperative for policymakers, industry stakeholders, and society at large to embrace its potential and navigate the opportunities and challenges ahead.

4. Challenges of Digital

4.1. Money Regulatory uncertainty: The lack of clear regulations poses challenges for the widespread adoption of digital currencies and raises concerns about consumer protection and financial stability

Navigating the regulatory landscape: The nebulous regulatory environment surrounding digital currencies presents a significant hurdle to their widespread adoption. The absence of clear and consistent regulations creates uncertainty for businesses, investors, and consumers alike, inhibiting mainstream acceptance and impeding the development of robust financial infrastructure. Moreover, regulatory ambiguity raises concerns about consumer protection, market integrity, and financial stability, highlighting the urgent need for comprehensive and forward-thinking regulatory frameworks.

4.2. Volatility and risk: Digital currencies are highly volatile, posing risks for investors and merchants alike

Tackling volatility and risk: Digital currencies are characterised by extreme price volatility, rendering them susceptible to sudden fluctuations and speculative trading activities. This inherent volatility poses risks for investors, merchants, and financial institutions, complicating investment decisions, transaction settlements, and risk management strategies. Furthermore, the speculative nature of digital currency markets can exacerbate price bubbles and market distortions, potentially leading to systemic risks and financial instability.

4.3. Privacy and anonymity: While digital currencies offer privacy features, they also raise concerns about anonymity and potential misuse for illicit activities

Balancing privacy and transparency: While digital currencies offer enhanced privacy features compared to traditional financial systems, they also raise concerns about anonymity and potential misuse for illicit activities. The pseudonymous nature of digital currency transactions can facilitate money laundering, terrorist financing, and other illicit activities, posing challenges for law enforcement agencies and regulatory authorities. Achieving the delicate balance between privacy and transparency remains a key challenge for the digital currency ecosystem, necessitating innovative solutions and collaborative efforts to mitigate risks and uphold regulatory compliance.

4.4. Technical limitations: Scalability, interoperability, and energy consumption are among the technical challenges facing digital currencies. never written and seen before

Addressing technical limitations: Digital currencies face various technical challenges, including scalability, interoperability, and energy consumption, that impede their widespread adoption and usability. Scalability issues, such as network congestion and slow transaction processing times, hinder the scalability of digital currency networks and limit their capacity to handle large transaction volumes efficiently. Interoperability challenges, meanwhile, restrict the seamless exchange of value between different digital currency networks and traditional financial systems, hindering cross-border transactions and interoperable financial services. Additionally, the energy-intensive consensus mechanisms used in some digital currency networks raise concerns about environmental sustainability and energy consumption, prompting calls for more eco-friendly alternatives and energy-efficient technologies.

In conclusion, while digital currencies offer transformative potential in reshaping the future of finance, they also face significant challenges that must be addressed to realise their full benefits. Overcoming regulatory uncertainty, volatility, privacy concerns, and technical limitations requires concerted efforts from policymakers, industry stakeholders, and the broader community to foster innovation, promote responsible use, and build a more resilient and inclusive financial ecosystem.

5. Case Studies: Germany, France, UK, and USA

5.1. Germany: The case of N26 showcases how the digital bank has integrated cryptocurrencies into its platform to provide users with access to a diverse range of financial services

Germany: N26, a leading digital bank in Germany, has emerged as a pioneer in integrating cryptocurrencies into its platform, offering users seamless access to a diverse range of financial services. By partnering with cryptocurrency exchanges and integrating digital wallet functionality, N26 has enabled its customers to buy, sell, and hold cryptocurrencies directly within their banking app. This integration not only provides users with greater convenience and flexibility but also reflects N26's commitment to embracing innovative financial technologies and meeting the evolving needs of its customer base.

5.2. France: Revolut's success in France highlights the growing acceptance of digital currencies and the role of digital banks in fostering adoption

France: Revolut, a prominent digital bank operating in France, has experienced significant success in fostering the adoption of digital currencies among its user base. Through its user-friendly interface, Revolut has made it easy for individuals in France to buy, sell, and manage cryptocurrencies, effectively democratising access to these emerging assets. The growing acceptance of digital currencies among French consumers underscores the shifting attitudes towards traditional banking and the increasing demand for alternative financial services. Revolut's success in France highlights the pivotal role of digital banks in driving the mainstream adoption of digital currencies and catalysing financial innovation.

5.3. UK: The UK's regulatory approach to digital currencies, including the Financial Conduct Authority's oversight of cryptocurrency businesses, provides insights into regulatory frameworks

UK: The United Kingdom has adopted a proactive regulatory approach towards digital currencies, with the Financial Conduct Authority (FCA) playing a key role in overseeing cryptocurrency businesses and ensuring compliance with regulatory standards. The FCA's regulatory framework provides clarity and transparency for digital currency businesses operating in the UK market, fostering confidence among investors and consumers alike. By implementing robust regulatory safeguards and promoting responsible innovation, the UK has positioned itself as a leading jurisdiction for digital currency businesses seeking to operate in a secure and regulated environment.

5.4. USA: Case studies such as Coinbase and Gemini illustrate the challenges and opportunities faced by digital currency exchanges in the highly regulated US market

USA: In the United States, digital currency exchanges such as Coinbase and Gemini have emerged as prominent players in the highly regulated market. These exchanges face a myriad of challenges, including regulatory compliance, cybersecurity risks, and customer trust, as they navigate the complex regulatory landscape of the US financial system. Despite these challenges, Coinbase and Gemini have capitalised on the growing interest in digital currencies among American consumers and investors, leveraging their robust infrastructure and regulatory compliance to provide reliable and secure trading platforms. The experiences of Coinbase and Gemini underscore the opportunities and challenges inherent in operating digital currency exchanges in the highly regulated US market, highlighting the importance of regulatory clarity and compliance in fostering trust and legitimacy within the industry.

In conclusion, the case studies of Germany, France, the UK, and the USA offer valuable insights into the evolving landscape of digital currencies and the role of digital banks and regulatory frameworks in shaping their adoption and acceptance. As digital currencies continue to gain traction globally, these case studies provide

valuable lessons for policymakers, industry stakeholders, and consumers alike, highlighting the opportunities and challenges inherent in the digital currency ecosystem.

6. Impact on Traditional Financial Systems

6.1. Disruption of traditional banking: Digital currencies threaten to disrupt traditional banking models by providing alternative financial services and reducing reliance on intermediaries

Disruption of traditional banking: Digital currencies have emerged as a disruptive force, challenging traditional banking models by offering alternative financial services and diminishing reliance on traditional intermediaries. With the rise of decentralised finance (DeFi) platforms and peer-to-peer lending protocols, individuals can access a wide range of financial products and services, including lending, borrowing, and asset management, without the need for traditional banks. This decentralisation of financial services threatens the traditional banking paradigm, compelling banks to adapt to changing consumer preferences and technological advancements or risk becoming obsolete in the digital age.

6.2. Central bank digital currencies (CBDCs): Central banks are exploring the issuance of CBDCs to modernise payment systems, enhance financial inclusion, and maintain monetary sovereignty

Central bank digital currencies (CBDCs): Central banks around the world are exploring the potential issuance of CBDCs as a means to modernise payment systems, enhance financial inclusion, and maintain monetary sovereignty. CBDCs represent digital representations of fiat currencies issued by central banks, providing a secure and efficient means of transacting in the digital economy. By leveraging blockchain technology and smart contracts, CBDCs offer the potential to streamline payment processes, reduce transaction costs, and extend financial services to underserved populations. However, the implementation of CBDCs poses complex challenges, including technological scalability, privacy concerns, and implications for monetary policy, requiring careful consideration and coordination among policymakers, regulators, and stakeholders.

6.3. Challenges for monetary policy: The proliferation of digital currencies poses challenges for monetary policymakers, including managing inflation, controlling money supply, and maintaining financial stability

Challenges for monetary policy: The proliferation of digital currencies presents significant challenges for monetary policymakers, as they grapple with managing inflation, controlling money supply, and maintaining financial stability in an increasingly digitalised financial landscape. Unlike traditional currencies, digital currencies are not subject to the same regulatory oversight and monetary policy tools employed by central banks, making it difficult to influence their value and supply. Furthermore, the decentralised nature of digital currencies and the global reach of digital currency markets complicate efforts to regulate and stabilise financial markets. As digital currencies continue to gain traction, monetary policymakers must adapt their policy frameworks and regulatory approaches to address the unique challenges posed by the digital currency ecosystem, ensuring the stability and resilience of the global financial system in the digital age.

7. Societal and Economic Implications: Financial inclusion

7.1. Digital currencies have the potential to promote financial inclusion by providing access to banking services for the unbanked and underbanked

Financial inclusion: Digital currencies hold the promise of promoting financial inclusion by extending access to banking services for individuals who are currently unbanked or underbanked. By leveraging mobile phones and internet connectivity, digital currencies enable individuals in remote or marginalised communities to participate in the formal financial system, conduct transactions, and access a wider range of financial services. This increased accessibility to banking services can empower individuals to save, invest, and build credit histories, thereby fostering economic stability and resilience among historically marginalised populations.

7.2. Economic empowerment: Digital currencies empower individuals to participate in the global economy, facilitate cross-border transactions, and reduce remittance costs

Economic empowerment: Digital currencies empower individuals to engage in the global economy, facilitating cross-border transactions and reducing the costs associated with remittances and international transfers. Through decentralised platforms and peer-to-peer networks, individuals can transact directly with one another, bypassing traditional financial intermediaries and their associated fees. This newfound economic empowerment enables individuals to seize opportunities for entrepreneurship, investment, and wealth creation on a global scale, unlocking economic potential and fostering innovation in emerging markets.

7.3. Wealth distribution and inequality: The adoption of digital currencies may exacerbate wealth inequality, as early adopters and technologically savvy individuals benefit disproportionately

Wealth distribution and inequality: While digital currencies offer opportunities for economic empowerment, they also have the potential to exacerbate wealth inequality, as early adopters and technologically savvy individuals may benefit disproportionately from their adoption. The decentralised nature of digital currencies and the speculative nature of digital currency markets can lead to wealth concentration among a select group of individuals or entities, widening the gap between the haves and the have-nots. Moreover, disparities in access to technology, education, and financial literacy may further exacerbate existing inequalities, perpetuating systemic barriers to wealth accumulation and economic mobility.

In conclusion, the societal and economic implications of digital currencies are multifaceted, offering both opportunities and challenges for individuals and communities around the world. While digital currencies hold the potential to promote financial inclusion, economic empowerment, and innovation, policymakers, industry stakeholders, and civil society must address the risks of wealth inequality and exclusion to ensure that the benefits of digital currencies are shared equitably and contribute to sustainable economic development for all.

8. Conclusions

8.1. Summary of key findings and insights

In conclusion, our exploration of the impact of digital currencies on various aspects of society and the economy has revealed a complex and dynamic landscape characterised by both opportunities and challenges. Key findings indicate that digital currencies have the potential to promote financial inclusion, economic empowerment, and innovation, yet they also pose risks such as exacerbating wealth inequality and challenging traditional financial systems.

8.2. Reflections on the future of money in the digital age

Looking to the future, it is evident that digital currencies will continue to play a significant role in shaping the future of money in the digital age. As technological advancements and regulatory frameworks evolve, digital currencies are poised to become increasingly integrated into mainstream financial systems, offering new avenues for financial services and economic participation.

8.3. Call to action for policymakers, industry stakeholders, and the public to navigate the evolving landscape of digital currencies responsibly.

In light of these developments, there is a pressing need for policymakers, industry stakeholders, and the public to collaborate in navigating the evolving landscape of digital currencies responsibly. Policymakers must enact clear and forward-thinking regulations to ensure consumer protection, market integrity, and financial stability in the digital currency ecosystem. Industry stakeholders must prioritise transparency, accountability, and responsible innovation to build trust and legitimacy within the digital currency industry. Lastly, the public must educate themselves on the opportunities and risks associated with digital currencies and make informed decisions about their use and investment.

In essence, the future of money in the digital age will be shaped by the collective actions and decisions of policymakers, industry stakeholders, and the public. By working together to address the challenges and

opportunities presented by digital currencies, we can build a more inclusive, efficient, and resilient financial system that benefits individuals and communities worldwide.

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