



CAN DIGITAL CRYPTOCURRENCIES OVERTURN INCLUSIVE FINANCE? AN ANALYSIS OF ITS SIGNIFICANCE BASED ON CHINESE INTERNET FINANCE

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ABSTRACT

This paper aims to explore the concept of digital cryptocurrency and its potential role in achieving inclusive finance. By drawing on relevant studies conducted in both China and abroad, we delve into the history and development, nature and types, as well as the benefits and risks associated with digital currencies. Additionally, the impact of digital currencies on deposit money is thoroughly examined, focusing on three key aspects: deposit currency stock, credit creation, and payment and settlement methods.

Furthermore, the study presents a compelling case study on financial inclusion, using Alipay as an illustrative example. Building upon this case study, the paper offers insights into the future development of digital currencies. Although the future development of digital currency remains somewhat speculative, this research provides valuable considerations and outlooks.



Overall, the emergence of digital currency technology represents a momentous milestone in the financial landscape. As we move forward, understanding its potential impact on inclusive finance becomes increasingly crucial. This paper aims to shed light on this fascinating subject, paving the way for further research and discussions in the field.

Keywords: Digital Cryptocurrency, Decentralization, Deposit Money, Inclusive Finance, Fintech.

1. Introduction

The wheel of history continues to roll forward into the early 21st century, marked by the advent of the Internet era and the impressive development of the financial sector, driven by advancements in science and technology. This progress has led to the emergence of digital cryptocurrency technology, reaching unprecedented heights. The introduction of digital currency technology represents a significant innovation for the entire traditional financial industry.

1.1 The History and Development of Digital Cryptocurrencies

The history and development of digital cryptocurrencies have been closely tied to the rise of credit cards, smartphones, and internet technology. These advancements have given birth to various monetary payment systems, including digital currencies that have revolutionized the way we transfer monetary value. To gain a comprehensive understanding of cryptocurrencies, it is essential to explore their centralized history and development.

Bitcoin, created by an individual or group using the pseudonym Satoshi Nakamoto^①, stands as one of the most renowned decentralized digital cryptocurrencies. Its inception dates back to early 2009 when the first white paper introducing Bitcoin was published. Bitcoin operates on an open-source software and functions through a decentralized peer-to-peer (P2P) network, allowing anyone to access it through internet. Essentially, it acts as a global network, connecting users across the world through computer terminals and enabling efficient information distribution. Within this network, each node or terminal user has the freedom to join or leave as desired. The term "BIT" refers to the network and technology, while the lowercase "bit" signifies the unit of currency, often abbreviated as "BTC."

Since its inception, Bitcoin has been at the center of ongoing debates regarding its potential as an alternative currency. Notably, Japan recognized Bitcoin as a legal payment system on April 1, 2017, and it has since gained significant traction in the country, with around 260,000

①Satoshi Nakamoto (Bitcoin: A Peer-to-Peer Electronic Cash System) , 2008



merchants accepting it. However, the global development of cryptocurrency technology has taken diverse paths, with some countries like China explicitly banning all self-cryptocurrency transactions in late September 2017 due to concerns over unregulated risks.

The evolution of digital cryptocurrencies, exemplified by Bitcoin, has had a profound impact on financial transactions and continues to shape the modern financial market.

1.2 Basic Concepts of Deposit Money

Deposit money represents a unique form of credit money backed by the creditworthiness of the issuing savings institution. The process of deposit money creation occurs when a single unit of currency can serve as the basis for multiple deposits, primarily achieved through repeated access to deposits.

Two essential conditions for deposit money creation are the widespread adoption of the credit system and the popularization of non-cash settlement operations. In the contemporary financial landscape, electronic transactions between banks and individuals with surplus funds are prevalent. Electronic numbers displayed on LCD screens have replaced physical cash, becoming the modern means of monetary exchange.

Utilizing the partial margin system, banks can retain a percentage of the margin from collected deposits and promptly release the remaining funds to meet the demand for funds in the form of digital currency. This process enables money circulation and facilitates indirect financing. By avoiding cumbersome cash access procedures, banks can create money on deposit through their standard banking operations. For instance, funds from individual A can be lent to individual B, and funds from individual C can be lent to individual D, streamlining the creation of money on deposit through banking practices.

Suppose the reserve ratio for deposits is denoted as r , and the initial increase in reserves absorbed by banks is R . In that case, the overall increase in deposits for the entire banking system can be calculated as:

$$D = R \times 1/r$$

Here, $1/r$ represents the deposit multiplier, indicating the amount of change in deposits for the entire banking system caused by each \$1 change in deposit reserves.

The IMF recommends dividing the money supply hierarchy in each country into two levels: M1 and M2. M1 comprises cash and demand deposits, including demand deposits in commercial banks but excluding credit money under the credit money payment system. On the other hand, M2 encompasses M1 and sub-currency, which includes more liquid forms of currency beyond M1, such as time deposits of the central bank, commercial banks, and



negotiable large certificates of deposit.

1.3 The Economics of Inclusive Finance

It is estimated that approximately 38% of the world's population lacks a formal bank account, resulting in about 40% being considered unbanked (World Bank, 2016). This startling statistic highlights the unequal access to financial services in developing regions such as Asia, Africa, and Latin America, which significantly hampers global economic development. While efforts by the IMF and the World Bank have improved the educational infrastructure for many children from disadvantaged backgrounds, their access to financial education and services remains inadequate. Consequently, they are unfairly deprived of the benefits of deposit and loan services offered by commercial banks, let alone opportunities to participate in securities and derivatives markets. The restrictive laws, regulations, and high entry costs in underdeveloped countries further discourage banks and financial institutions from providing essential services to the people in these regions.

Developing inclusive finance is a critical step towards enhancing financial inclusion by leveraging financial technology to reduce operational costs and improve the sustainability of businesses. Inclusive finance aims to grant access to financial products and services for individuals and businesses, promote financial equality and integration among nations, and foster global sustainability.

However, achieving universal inclusive finance faces several challenges. Financial institutions, especially banks, tend to prioritize high-profit customers at the top of the wealth pyramid, often overlooking the needs of those at the lower end. Local government laws, regulations, and supervision can also contribute to this disparity. Additionally, business units' focus on performance can lead to neglecting the development of more inclusive products and services, hindering progress towards inclusive finance.

Traditional financial institutions face rising business costs due to capital adequacy requirements and compliance regulations. Embracing fintech technology can help reduce these costs, enabling them to provide financial services to individuals at the lower end of the wealth pyramid, thereby promoting inclusive finance. Simultaneously, extending inclusive financial services to these individuals can be mutually beneficial, as it offers growth potential and fosters reciprocal relationships between financial institutions and their customers.

Inclusive finance is crucial for achieving financial equity, as it accelerates economic inclusion. While only 41% of adults in developing countries have formal bank accounts, 89% in developed countries enjoy this privilege (World Bank, 2016). To address global income inequality, organizations like the G20 and the World Bank actively advocate for inclusive



finance. Digital platforms play a pivotal role in improving financial intermediary efficiency, increasing transparency in remittances, and reducing remittance costs, contributing to the overall goal of expanding financial services, including payments, savings, insurance, and credit.

2.Literature Review

For the definition of Inclusive Finance, Rangarajan (2018) mentioned it as “The process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost.” Defining Inclusive Finance, includes such services as savings, transactions, payment/transfer, credit at an affordable cost to the low section of society (Kopala, 2010). Varghese & Viswanathan (2018) also defined Financial Inclusion as, “Access to appropriate, low cost, fair and safe financial product and services from the mainstream service provider”.

The study of the relationship between digital cryptocurrency and inclusive finance is interdisciplinary, drawing insights and methodologies from diverse fields such as economic crimes, monetary affairs, government regulation, and future ecosystem research. Understanding how digital cryptocurrencies can contribute to fostering financial inclusion is a complex undertaking, requiring collaboration and analysis from these multifaceted perspectives.

Victor Dostov and Pavel Shust (2014) analyzed characteristics of digital-cash and bitcoin protocols against cash and cashless payments, and drew on “bundle of attributes” that may define their attractiveness for common public or criminals. They found that characteristics of the cryptocurrencies are unlikely to make them popular among the consumers, as demand for anonymity seems to be overrated. Cryptocurrencies can also be classified as payment instrument rather than private currencies, therefore their embeddedness in the financial system minimizes the money laundering and terrorist financing(ML/TF) risks.

Hendrickson, Hogan, and Luther (2016) constructed a model with endogenous matching and random consumption preferences, revealing various monetary equilibria, including a scenario where bitcoin coexisted with the official currency. They meticulously examined the factors that influence government transactions policy, potentially discouraging the adoption of bitcoin. Their findings demonstrate that implementing such a policy becomes more challenging when certain users strongly favor bitcoin, as they can circumvent interactions with users who exclusively hold the official currency during the matching process.

Bashilov, Galkina, and Berman (2021) conduct an analysis of the methods used to ascertain the legal categorization of digital financial assets and digital currency within existing domestic



legislation, especially during the phase when such legislation is still being formulated. Their analysis is based on an examination of regulatory enforcement practices and official clarifications issued by state authorities. Their findings reveal that the majority of countries worldwide are currently at a stage where the circulation and utilization of digital financial assets and digital currency remain unregulated. Nevertheless, many of these countries are actively engaged in the process of crafting relevant legislation, while some have already implemented specialized regulations in this domain.

Pawłowska, Staniszewska, and Grzelak (2022) conduct a comprehensive examination of the influence of digital cryptocurrencies on the pursuit of sustainable climate and social objectives through innovative financial instruments. Their research reveals that digital cryptocurrencies play a vital role in advancing green finance, which is crucial in addressing environmental protection and climate change. Moreover, these cryptocurrencies offer industrialized nations a valuable opportunity to achieve sustainable growth. In a separate study, Alice, Ab-Rahim, and Amy (2022) perform a focused analysis on regional economies within the ASEAN-6 countries. They establish a Fintech Index spanning from 2017 to 2019 and find that Singapore possesses the most robust Fintech ecosystem, followed by Thailand, Malaysia, Vietnam, Indonesia, and the Philippines.

Jacopo Temperini and Marcella Corsi (2023) categorize currently available cryptocurrencies into four groups: Bitcoin, altcoins (alternative and/or complementary cryptocurrencies to Bitcoin), stablecoins (digital coins pegged to fiat currency), and central bank digital currencies (CBDCs). They describe the economic characteristics of each category and analyze their potential contributions to financial inclusion. While all categories may contribute to democratizing money, the authors argue that CBDCs are the most effective in achieving the goal of financial inclusion. They suggest that it is not money itself that needs democratization, but rather the role of central banks in the economic system.

The existing literature indicates that digital cryptocurrencies have the potential to significantly impact inclusive finance by providing access to financial services for vulnerable and low-income groups. However, further research is necessary to fully comprehend the long-term implications of integrating digital cryptocurrencies into inclusive finance initiatives and to identify strategies that ensure sustainable and inclusive outcomes.

3. Research Methodology

The research methodology employed in this study is a combination of desk research and case study analysis. The primary data for this research is gathered from open websites, including authoritative sources such as the United Nations (UN), World Bank, International Monetary Fund (IMF), and other reliable databases. These sources provide valuable data on global



financial trends, economic indicators, and the status of financial inclusion initiatives worldwide. The case study analysis focuses specifically on Alipay, one of the leading digital payment platforms in China, to gain an in-depth understanding of the role and impact of digital cryptocurrencies on inclusive finance within the context of a rapidly evolving economy.

The combination of desk research and case study analysis enables a well-rounded exploration of the subject matter, incorporating both quantitative and qualitative data. This approach facilitates a deeper understanding of the relationship between digital cryptocurrencies and inclusive finance, with Alipay serving as a specific illustration of the broader trends observed in the financial sector. The research findings are expected to contribute valuable insights to the ongoing discourse on leveraging digital payment platforms for fostering financial inclusion and sustainable economic growth in developing economies.

4. Results and Discussions

4.1 Digital Cryptocurrencies

4.1.1 Nature and Types of Digital Cryptocurrencies

Hileman (2009) presents a comprehensive classification of digital currencies into two main types: tangible digital currencies and virtual digital currencies. The value of tangible digital currencies, referred to as "commodity money," is determined by factors such as scarcity and utility. However, our focus here is on virtual currencies designed for value transfers.

Digital currencies can be categorized based on the distribution of value transfer and the degree of concentration, as well as geographical restrictions:

- 1) Centralized and not geographically restricted
This category encompasses closed systems of transactions within specific entities. A common example is the point system used by various companies to enhance customer loyalty. Additionally, digital currencies that exist virtually on electronic devices, such as WeChat and Alipay's e-wallets, belong to this category. These currencies offer the advantage of combining online and offline usability, enabling value storage and transfer without limitations of time and space.
- 2) Centralized and geographically restricted
In this category, governance tends to be centralized, while the transfer of value is localized. These currencies are subject to local laws, regulations, and social contracts.
- 3) Centralized and cross-platform
Digital currencies in this category can transfer and exchange value between each other through internet platforms, thanks to the use of smart contracts. While they may start as decentralized



systems, their value is realized through the digital trading of goods on internet platforms. Notably, the open market system represented by Flooz and Beenz serves as a prominent example.

4) Completely decentralized

Bitcoin and dogcoin, which have gained widespread recognition in recent years, belong to this form of digital currency. They demonstrate a complete decentralization tendency and can be traded with any external object through the internet medium. The open-source nature of their software necessitates decentralized management and regulatory schemes. However, this completely decentralized form of digital currency presents a significant challenge for governments worldwide, as it falls outside the purview of traditional regulation and is not well governed by existing laws and regulations. Despite their strong currency transfer properties, effectively regulating such currencies remains a substantial challenge for governments in all countries.

4.1.2 Benefits and Risks of Digital Cryptocurrencies

As an emerging monetary technology, digital cryptocurrency offers various benefits and risks that warrant careful consideration:

1) Payment Security

Digital cryptocurrency transactions provide enhanced payment security through the use of private accounts with personal keys, ensuring complete control by individual users. The anonymity of transaction information between parties addresses issues of distrust present in traditional financial systems. For instance, cryptocurrencies like Bitcoin enable secure transactions without the need for third-party intermediaries, promoting trust between parties and facilitating seamless exchanges.

2) Cost Reduction

Cryptocurrencies, particularly Bitcoin, offer a cost-effective alternative to traditional electronic payment methods. With minimal or no transaction fees, businesses and merchants can significantly reduce expenditure on payment processing. The integration of cryptocurrency technology with credit and debit cards in various countries further enhances efficiency and resource utilization.

3) Regulatory Issues

Digital cryptocurrency technology brings regulatory challenges for governments. Some countries, like China, have taken stringent measures to restrict intermediaries dealing with cryptocurrency technology, while others are exploring new regulatory directions. Encouraging innovation while managing risks, such as potential involvement in illegal activities, poses a



delicate balancing act for national regulators.

4) Economic Risks

The emergence of digital currencies, particularly Bitcoin, has disrupted traditional financial and payment markets. While they have the potential to replace remittances and bank cards, their growth may destabilize markets and lead to price volatility. Additionally, concerns over money laundering and terrorism financing may result in a cautious approach from financial institutions, affecting the willingness of ordinary businesses to engage in cryptocurrency transactions.

Overall, the adoption of digital cryptocurrencies presents both opportunities and challenges. While it enhances payment security and reduces costs, regulatory and economic risks need to be effectively managed to ensure the long-term sustainability and inclusivity of this transformative monetary technology. Continued research and proactive regulatory measures are vital to harnessing the full potential of digital cryptocurrencies for the benefit of society and the global economy.

4.1.3 Impact of Digital Cryptocurrencies on Deposit Money

1) Impact of digital cryptocurrency on the stock of deposit money

In recent years, the rapid development of Internet finance has enabled financial institutions to leverage big data and technology to promote information symmetry and enhance information utilization efficiency. Digital currency flows are controlled at the big data level, allowing for timely adjustments to the stock of deposit currency. Moreover, financial institutions can utilize big data to gain valuable insights into counterparties, enabling them to allocate limited financial resources to high-quality enterprises and projects, generating positive externalities.

Digital currency's positive impact on the stock of deposit money is also evident in the realm of financial technology (fintech) innovation. Fintech enables financial institutions to break away from traditional organizational forms and gain a competitive edge through efficient information screening. This competitive utility drives traditional financial institutions to transform themselves and embrace fintech. Notably, giants like Ping An have capitalized on their vast reserves of big data to develop successful fintech projects, further invigorating the financial chain.

2) Impact of digital cryptocurrency on the credit creation of deposit money

As digital currencies continue to develop, they may serve as alternative currencies, potentially reducing the dominant position of deposit currencies as a means of payment. This shift could affect the asset-liability structure of commercial banks, which rely on external deposits to meet their lending needs and manage deposit and loan risks. If digital currencies replace deposit



money, commercial banks might face challenges in fulfilling their lending requirements, leading to potential early loan withdrawals, which could destabilize banks and cause economic losses.

3) Changes of digital cryptocurrency on the payment and settlement method

The existing settlement system in China, comprising the central bank and commercial banks, relies heavily on deposit currency for internal transactions. However, traditional inter-bank remittance systems face challenges like transaction delays. Digital currency, with its direct connection between depositor and lender, offers a more efficient alternative. Financial institutions, in this digital currency ecosystem, act as platforms rather than controllers of transactions.

From a liquidity perspective, traditional deposit money transactions often experience delays and require inter-system platforms. Digital currency, on the other hand, offers swift and direct transactions, maximizing efficiency. Traditional banks often charge fees for interbank and cross-border transfers, which can be burdensome for users. In contrast, digital currency platforms enable peer-to-peer trading without intermediaries, reducing transaction costs and increasing efficiency.

Overall, the market trend favors cost reduction and efficiency, making digital currencies an attractive option for users seeking seamless, efficient, and cost-effective payment and settlement methods. The adoption of digital currencies is reshaping the financial landscape and offering unique advantages that traditional systems cannot replicate.

4.1.4 Impact and Future of the Digital Cryptocurrency

The digital cryptocurrency revolution's most significant feature lies in its seamless integration of Internet of Things (IoT) technology with blockchain, the underlying cryptocurrency technology. This powerful combination plays a pivotal role in facilitating value and ownership transfers of commodities between users, driving the industry forward and reshaping the global landscape.

Digital cryptocurrencies are poised to make a profound impact on the digital product derivatives industry, rendering physical wallets obsolete. The convenience offered by cryptocurrencies, accessible through smart devices like watches and cell phones, allows for seamless transactions both domestically and internationally. Compared to physical wallets, e-wallets and digital cryptocurrencies provide unparalleled benefits, making their eventual replacement of physical wallets highly likely. A notable example is the shared assets industry, where internet-based contracts enable individuals to share unused resources like hard disks and computer memory, generating rental income. The growth of shared assets is an



advantageous offshoot of the digital currency development, fostering efficient utilization of excess resources within a sharing economy model.

Despite the digital currency's potential, mainstream media coverage continues to be predominantly negative, leading to significant information asymmetry and resistance within the financial industry. Some banks refuse to open digital cryptocurrency accounts for startups due to credit risk concerns, while others reject digital cryptocurrency technology altogether out of fear of competition. However, as the value of digital currencies rises, drawing the attention of numerous investors, and with the market's blindness, resistance towards this financial innovation among the general public is gradually diminishing. Consequently, digital cryptocurrencies are gaining acceptance among the broader population, while scholars and savvy investors are actively exploring and reaping the rewards of this emerging financial frontier.

In conclusion, the seamless convergence of IoT and blockchain technologies has unleashed the potential of digital cryptocurrencies to reshape industries, enhance convenience, and foster a sharing economy. While challenges remain due to information asymmetry and resistance, the growing acceptance among the public and increasing interest from investors indicate the potential for continued evolution and transformation within the financial landscape.

4.2 China Internet Finance and Alipay

China has emerged as a global leader in the field of Internet finance, with five of the world's top 10 fintech companies based in the country. The growth of Internet finance in China has been fueled by significant funding, with companies like Ant Financial, Lujinsuo, and Jingdong Financial securing substantial investments. From large-scale financing enterprises to small-scale smart parking payments, the presence of Internet finance is ubiquitous across various industries.

Inclusive fintech has garnered particular interest from the investment community, and companies in this sector rely on core strategic technologies such as ABCD (Artificial Intelligence, Blockchain, Cloud, and Data Analytics) and BASIC (Blockchain, Artificial Intelligence, Security, Internet of Things, and Cloud Computing).

The development of Internet finance aligns with China's inclusive economic policy, aimed at achieving common prosperity. This approach emphasizes extending financial services to remote and rural areas, resulting in high penetration rates and making China a global leader in Internet finance. Third-party payment methods, like WeChat Pay and Alipay, are increasingly replacing traditional methods, reflecting the vibrancy of Internet finance in China.



Fintech has also contributed to optimizing the structure of the real economy, particularly benefiting medium, small and micro enterprises (MSMEs). These enterprises play a crucial role in China's economy, contributing significantly to GDP, tax revenue, and employment. However, they often face challenges in accessing financial credit due to their small scale and weak risk resistance. Fintech has opened up new avenues for private lending, enabling MSMEs to access capital through online channels, revitalizing their potential, and driving market economy development.

The emergence of live streaming with goods represents a revolutionary shift in the traditional offline retail model. The internet has become a channel through which significant capital flows into MSMEs, activating their potential and promoting market economy growth. Moreover, big data technology enables transparency and openness of information for investors, fostering high-quality financial lending and alleviating information asymmetry for MSMEs, which is vital for their healthy development within the socialist market economy system.

Alipay's inception by Alibaba in 2004 was a key milestone for Internet finance in China. Its escrow service played a crucial role in building Alibaba's Internet financial system focused on transaction finance. After being divested from Alibaba in 2011, Alipay, now owned by Ant Financial Services, has achieved immense success, boasting 600 million registered users and a valuation of \$50 billion.

While the United States leads the global Internet industry with companies like Meta, Amazon, and Google, China holds a dominant position in Internet finance, leading the way in its development worldwide. China's private economy has been a dynamic force in the country's socialist market economy, and Internet finance has been instrumental in the transformation and growth of this sector. With its innovative use of technology and focus on inclusive finance, China's leadership in Internet finance is expected to continue shaping the future of global financial systems.

5. Conclusion

The emergence of digital currencies, particularly digital cryptocurrency technology, has already made a substantial impact on deposit money. Its advantages surpass traditional deposit money, and over time, it may even replace its existence. While the past cannot be changed, we can shape the future. The inevitability of digital currency requires thorough examination of its regulation and guidance. Today's economic entities must earnestly study the direction for effectively managing and guiding the development of digital currency technology. Meanwhile, we should exercise caution and not overly exaggerate the potential of digital currencies.



As the world embraces the era of digital currencies and fintech, understanding their significance based on the success and challenges witnessed in Chinese Internet finance is essential. Digital cryptocurrencies have the power to overturn inclusive finance positively by offering more accessible and efficient financial services, benefiting both individuals and businesses, especially in underserved areas. However, achieving a balance between innovation and regulation will be crucial in harnessing the full potential of digital currencies for the greater good. As seen in China's experience, embracing technology-driven financial solutions can lead to tremendous opportunities for financial inclusion and economic growth. Therefore, fostering a conducive environment for the development and responsible use of digital cryptocurrencies can indeed revolutionize inclusive finance, creating a more inclusive and prosperous global financial landscape.

In conclusion, the development of digital currencies, particularly digital cryptocurrency technology, presents both opportunities and challenges for the financial landscape. While it holds the potential to revolutionize global financial inclusion, its unregulated nature and market-driven volatility necessitate a balanced approach to harnessing its benefits responsibly. As we move forward, effective regulation and thoughtful guidance are crucial to ensure the successful integration of digital currencies in the financial ecosystem, leading to a more inclusive and sustainable financial future.



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