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# *Evolution of Digital Currency and Its Economic and Financial Implications in China*

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***Abstract:*** This paper conducts a comprehensive examination of the multifaceted impact of digital currencies within the context of China, encompassing economic, financial, and business dimensions. It provides an in-depth exploration of the evolutionary path of China's digital currencies through literature review, with a special focus on the development of central bank digital currencies (CBDC). From an economic standpoint, the analysis uncovers several noteworthy aspects, including the potential for cost savings, an expansion of the monetary base, and enhanced ease of financing. On the financial front, digital currencies exhibit the capacity to reduce operational expenses and mitigate fraud risks. However, they simultaneously intensify competition among commercial banks, impacting their profitability and operational autonomy. Moreover, the study scrutinizes the adoption of digital currencies within advanced regions, spotlighting noteworthy innovations in Hangzhou, such as the digital RMB payment ecosystem and the use of digital codes for metro rides. Conclusively, the paper advocates for reinforced international collaboration to bolster credit services and adapt to the ever-evolving technological and regulatory landscape.

***Keywords:*** digital currencies, China, Central Bank Digital Currency (CBDC), financing

## 1. Introduction

With the development of technology and the digital economy, more and more countries begin to consider executing the release of digital currencies to central banks [1]. The International Monetary Fund defines a digital currency as a digitally represented form of sovereign money issued by a jurisdiction's central bank or monetary regulatory authority. The European Banking Industry defines digital currencies as forms of currency that lack issuance by a central bank or authoritative body. These currencies also stand apart as they aren't tied to any specific fiat currency but are nevertheless widely accepted by the general public. Moreover, The Bank for International Settlements indicates that digital currencies are digital forms of central bank money that are distinct from traditional reserve or settlement accounts. China's digital currency, or central bank digital currency (CBDC for short) is issued by the People's Bank of China (PBOC) and circulated in digital form called digital currency through legitimate operators and legally compliant operating organizations that offer exchanges to the PBOC [2].

Over the past few years, China has made substantial strides in the development of digital currencies. It has undertaken initiatives aimed at widespread adoption and introduced a multitude of new policies across various domains. Despite these efforts, the general populace continues to grapple with

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limitations in their understanding of digital currencies. This paper endeavors to delve into the implications and potential applications of digital currency within the Chinese context, drawing insights from both extensive literature reviews and comprehensive data analysis. Furthermore, it is worth noting that the progress of digital currencies within China exhibits regional disparities. Consequently, this article will place a special emphasis on the divergent trajectories of digital currency development in more advanced regions.

## 2. Overview of Digital Currencies

### 2.1. Mainstream Digital Currencies

Digital currencies can be broadly categorized into two distinct types: Centralized currency and Decentralized currency. The primary differentiator between these two categories lies in their origins. Centralized currency is issued and regulated by governmental authorities or financial institutions, whereas Decentralized currency is not beholden to any governmental or financial entity for its issuance and governance. These three main types encompass the spectrum of digital currencies. The first category is Central Bank Digital Currency (CBDC), which serves as a digital representation of a nation's official legal tender and is issued by the central bank.The second is Cryptocurrency, which are digital assets offered by individuals or organizations rather than central banks or government departments. Cryptocurrency uses blockchain technology to record cryptographic transactions. The third category is Stablecoins, a specific type of cryptocurrency distinguished by its intrinsic link to real-world assets. These digital currencies derive their value from tangible assets and leverage blockchain technology for transaction processing [3].

### 2.2. The Development of Digital Currencies in China

Digital currency adoption is rapidly advancing in China. China, as the world's second-largest economy, possesses a vast consumer base and boasts a mature mobile payment infrastructure that has evolved from the earliest Point of Sale (PoS) systems to contemporary giants like Alipay and WeChat Pay. These factors serve as the cornerstone for the advancement of digital currency within China. On a national scale, the Chinese government has displayed a favorable disposition towards the progression of digital currency. The central bank's digital currency project has undergone extensive phases of theoretical exploration, framework establishment, and initial research and development design. In 2014, the central bank established a legal digital currency special research group; in 2015, the digital currency bill completed two rounds of revisions; in 2017, the central bank's Digital Currency Research Institute was formally launched, and the digital trading platform given to the blockchain was successfully tested [4]; in January 2020, the central bank announced significant progress, indicating that the design, formulation, and functional development of the official digital currency were largely finalized. Subsequently, in April 2020, the digital currency initiated its internal testing phase. By August of the same year, specific pilot areas were identified for the digital RMB project, encompassing regions such as Beijing-Tianjin-Hebei, the Yangtze River Delta, the Guangdong-Hong Kong-Macao Bay Area, and select areas in the central and western regions.

## 3. The Impact of Digital Currency in China

### 3.1. Economic Impact of Digital Currencies

Digital currency, existing purely in electronic form, obviates the necessity for resource-intensive processes such as printing, storage, transportation, and associated expenses. Hence, in the event that the Chinese government achieves a substantial transition from cash to digital currency usage, it stands

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to potentially save approximately 70 billion yuan, equivalent to roughly $9.6 billion. Furthermore, since the central bank's digital currency falls under the category of M0 (which typically represents the "monetary base"), it forms a fundamental component of the monetary base. As digital currencies gain widespread acceptance, many individuals will leverage the convenience and portability they offer, resulting in a shift towards M1 (comprising the total amount of money in circulation). This transition to M1, and subsequently to M2 (which encompasses all elements of M1 as well as savings accounts), will contribute to the expansion of the overall money supply. Consequently, banks will find themselves in a position to increase their capacity for creating deposits [5]. By extension, this process results in the availability of more loanable funds within the market. The portability of digital currencies offers optimism for alleviating the financing challenges faced by certain small businesses. Additionally, CBDC has the potential to emerge as an effective tool for economic regulation in the future. The central bank could directly inject digital currency into companies seeking to borrow or raise capital, thereby reducing interest rates, expediting currency circulation, and fostering economic growth and development [6].

### 3.2. Financial Impact of Digital Currencies

Digital currencies have an impact not only on financial intermediaries such as commercial banks, securities institutions, and third-party payment institutions, but also on the stability and operational efficiency of financial markets. This influence can be classified into both positive and negative impacts on the financial landscape.

#### 3.2.1. Positive Influence

First of all, the issuance of digital currencies is conducive to reducing the cost of cash management, as traditional paper currencies need to be stored and kept, counted and transferred and other related work. According to Laborite, the current overall cost of cash operations in China is roughly 90 billion yuan per year, and digital currencies can reduce the cost of cash utilization in the region by more than 20 percent through digital analysis [7]. Secondly,the introduction of digital currencies carries the potential to mitigate fraud risks. Law enforcement agencies can employ advanced technologies, such as big data analysis, to trace the origins and movement of funds, thereby contributing to the preservation of social stability [8]. Thirdly, the adoption of digital currency develops the efficiency in banking, people can operate the machines themselves. Gone are the days of waiting in line for traditional human services. For example, a new debit card used to require the customer to fill out a variety of forms, which took at least 20 minutes, but now it takes only five minutes to complete [9].

#### 3.2.2. Negative Influence

Conversely, on the downside, digital currencies are poised to escalate competition among commercial banks. This is due to the potential for a degree of uniformity in the services and scenarios associated with digital currencies. Consequently, banks will engage in a perpetual cycle of competition, striving to introduce innovative products and secure their market share. Moreover, The central bank's digital currency enables precise targeting and the adjustment of interest rates for enterprises seeking loans [8]. This, in turn, compels commercial banks to introduce more competitive loan offerings, effectively diminishing their profitability. In addition, the issuance of digital currency will also affect the autonomy of commercial banks' credit business to some extent. Since the central bank can monitor the flow of digital currencies, commercial banks will not be able to provide financial support according to the market situation, and their lending autonomy will be limited.

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## 4. Case Study: Analysis of Digital Currency Development in Hangzhou

Although digital currencies are growing in China, there are still gaps in development in different regions, as each region has a different attitude towards digital currencies and overall economic trends. Due to varying regional attitudes towards digital currencies and disparities in overall economic trends, the development of digital currencies may progress at a slower pace in certain areas. For instance, rural regions with limited demand for digital currency-based transactions might experience a more gradual adoption process. In light of Hangzhou's distinction as China's "First City of Digital Economy" and its strategic position within the Yangtze River Delta region, it becomes essential to delve into the specific implementation of the digital economy within Hangzhou.

In February 2022, in preparation for the successful introduction of digital RMB in a new series of pilot cities, the Hangzhou Branch of the Agricultural Bank of China took an innovative step by establishing a digital RMB payment environment within the staff cafeteria. Furthermore, the branch actively collaborated with diverse government agencies to tailor custom digital RMB consumption incentives for distinct customer segments, aiding in government-led efforts to stimulate consumption. This comprehensive approach included the planning of promotional initiatives, such as the "one yuan purchase" campaign, among others [10].

In May 2023, Hangzhou introduced the digital RMB ride code, enabling citizens to access the subway seamlessly. This innovative code also incorporates "double offline crossing" technology, ensuring its usability even when both the mobile phone and subway gate lack an online connection [10].

According to an interview with the co-director of the Digital Economy and Financial Innovation Research Center at Zhejiang University's International Joint School of Business, a key objective of Zhejiang's digital RMB pilot in 2023 is to successfully integrate the Hangzhou Asian Games application pilot, thereby establishing a robust digital RMB application ecosystem and industrial framework with strong recognition in Zhejiang [11].

The People's Bank of China's Hangzhou Central Sub-branch instituted a novel working mechanism and collaborated with relevant authorities to create a conducive environment for the pilot program. For instance, they partnered with technology company Zhongcheng Chain to provide essential technical support for the digital RMB pilot, encompassing functions like automatic clearing and settlement, platform sub-accounting, and payroll generation. This collaboration culminated in the successful deployment of digital RMB during the Hangzhou Asian Games, offering both domestic and international attendees a user-friendly, intelligent, and feature-rich digital RMB experience [11].

In summary, Hangzhou's proactive approach to digital currency adoption demonstrates the city's commitment to innovation and technological advancement. It serves as a model for how digital currencies can be integrated into urban life, facilitating convenience and efficiency while showcasing their potential to enhance large-scale events and boost economic activities.

## 5. Suggestion

### 5.1. Increased Cooperation Among Banks

China's central bank digital currency should foster enhanced collaboration with its counterparts. The various institutions authorized by the central bank to employ this currency can mutually exchange their insights and experiences. As they fortify their individual research and development efforts, they can leverage their respective strengths to augment one another, fine-tuning their systems for the utmost efficiency. This collective effort aims to deliver the most portable and superior services to the public. Enhance the accuracy and accessibility of credit services through the development of new technologies. Reduce the risk that implementing digital currency will bring. Understand the real needs

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of customers and present solutions that benefit people and the public to achieve high quality operations.

### 5.2. Updating of Laws and Technology

The trend of digital currencies is full of uncertainty, affected by many aspects such as technology, market and law, the trend can change at any time. With the current situation, more and more countries will begin to develop and issuance CBDCs in the future. With the rapid development of digital currency, governments should refine laws and frameworks to ensure the compliance, safety and stability within the digital currency market. At the same time, blockchain technology and technology companies will continue to evolve and improve their production and technology. This development broadens the horizons for a multitude of use cases, encompassing supply chain management, identity verification, smart contracts, and data security. Moreover, these companies are poised to innovate and create new technologies aimed at mitigating potential adverse effects arising from the widespread adoption of digital currencies.

## 6. Conclusion

In conclusion, this paper provides a comprehensive examination of the multifaceted impact of digital currencies, with a specific focus on China's Central Bank Digital Currency (CBDC). The analysis encompasses economic and financial dimensions, shedding light on the evolving landscape of digital currency adoption. The study underscores the regional variations in digital currency adoption within China, with Hangzhou serving as a noteworthy example of innovative digital currency applications, including the digital RMB payment ecosystem and digital codes for metro rides. This paper advocates for strengthened international cooperation to enhance credit services and adapt to the dynamic technological and regulatory landscape. The adoption of digital currencies represents a pivotal juncture in the global financial landscape, and further research and collaboration are essential to fully grasp and harness their potential. Also, this paper primarily focuses on the macroeconomic impact of digital currencies and lacks an in-depth analysis at the microeconomic level. Future research could delve into how individual households and businesses are affected.

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