



# The Challenge and Opportunity of Digital Currency Development to International Financial Stability

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**Abstract.** With the rapid rise of digital currencies, the international financial system is facing unprecedented challenges and opportunities. This article aims to explore the impact of digital currency development on international financial stability, deeply analyze the multifaceted challenges brought by digital currency, and emphasize the opportunities brought by digital currency in financial innovation, financial inclusiveness, and payment efficiency. Firstly, the challenges brought by digital currency to international financial stability were explored from the perspectives of law and regulation, as well as monetary policy and economy. Secondly, the opportunities brought by digital currency were explored from the perspectives of financial innovation and inclusivity, payment efficiency and cost reduction, as well as financial data and analysis opportunities.

**Keywords:** digitization; Currency; international finance

## 1 Introduction

Digital currencies, especially cryptocurrencies such as Bitcoin and Ethereum, have emerged globally and attracted widespread attention in the international financial field. The gradual maturity of its technological foundation, blockchain technology, and the increasing participation of users and investors have led to the continuous expansion of the digital currency market, which has had a profound impact on the international financial system. Therefore, in-depth research on the challenges and opportunities of digital currency for international financial stability is of great practical significance.

## 2 The Challenges of Digital Currency to International Financial Stability

### 2.1 Cross border regulatory and compliance issues

Firstly, cross-border transactions of digital currencies may trigger regulatory conflicts between different countries. Data shows that over 160 countries or regions around the world have issued or experimented with digital currencies, but there are significant

differences in regulatory standards and policies among countries. For example, China has adopted an active digital renminbi pilot policy, while India has considered prohibiting private ownership of digital assets. This difference may lead to legal uncertainty and pose risks to international cross-border transactions.

Secondly, the instability of the digital currency market has also increased the difficulty of regulation. The data shows that the price volatility of some digital currencies such as Bitcoin is higher than that of traditional currencies and financial assets, as shown in Figure 1, which shows the price trend of Bitcoin. Data shows that some investors suffered significant losses in the digital currency market during the fluctuations in Bitcoin prices in early 2021. According to CoinMetrics, in January 2021, the price of Bitcoin fell from approximately \$40000 to approximately \$30000, causing investors to lose billions of dollars. This has raised concerns about financial stability, and regulatory authorities have begun to review risk management and market manipulation issues in the digital asset market [1].

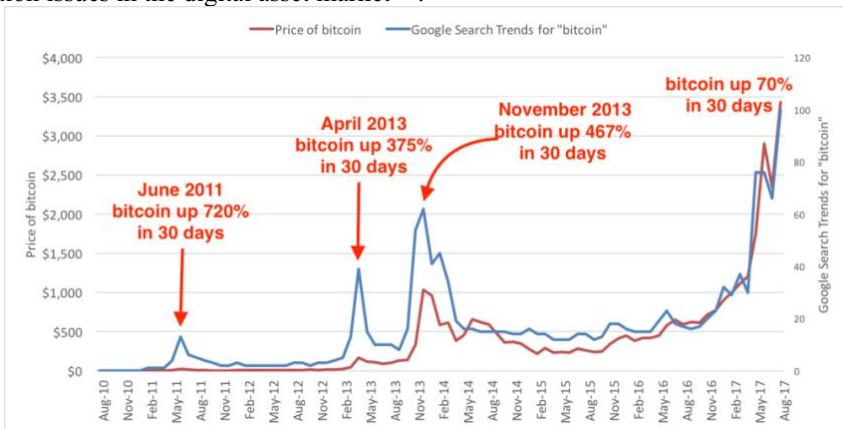


Fig. 1. Historical Price Trend of BTC

## 2.2 Monetary Policy and Economy

### (1) The loss of control of monetary policy

Firstly, digital currency is not controlled by the central bank, and its issuance and management are usually automatically executed by blockchain technology and distributed ledger technology. Taking Bitcoin as an example, its total supply is fixed, with a maximum of no more than 21 million pieces. This means that the central bank cannot increase or decrease the money supply to cope with economic fluctuations like traditional currency. Secondly, the cross-border nature of digital currency makes international monetary policy coordination more difficult. According to data from 2021, Bitcoin and other digital currencies are widely circulated globally, with holders spread across various countries. Bitcoin has a market value of hundreds of billions of dollars and has exchanges in multiple countries. This makes digital currency cross-border in nature and not subject to regulation by a single country.

### (2) Inflation and depreciation risks

Firstly, as digital currency is usually not controlled by the government or central bank, its supply and value may be influenced by market supply and demand relationships. According to the design of Bitcoin, its total supply is limited to 21 million pieces. As of 2021, approximately 18.75 million Bitcoins have been circulating in the market. This supply restriction may lead to excessive demand for Bitcoin in the market, thereby increasing its price. This supply-demand relationship may lead to inflation or price fluctuations. Secondly, the market volatility of digital currencies is high, and prices may experience rapid fluctuations. According to CoinMarketCap data, the price volatility of Bitcoin between 2020 and 2021 was 84% and 63%, respectively. This highly volatile characteristic may attract speculators who seek to profit from short-term fluctuations in prices. This speculative behavior can trigger unstable price fluctuations and have a negative impact on the value of digital currencies. Finally, the global nature of digital currencies may exacerbate the risks of inflation and depreciation. The data from 2021 shows that the global nature of the digital currency market is very evident, with investors from different countries and regions participating. This means that the digital currency market may be influenced by macroeconomic factors from different countries and regions, such as currency policies, political stability, etc [2].

### **2.3 Potential challenges and risks**

#### **(1) Privacy and security issues**

Although the transaction itself is anonymous, the blockchain records of the transaction are public and can be analyzed and tracked. This means that although the user's identity may not be immediately exposed, their transaction history can be traced back. Some digital currency projects attempt to provide stronger privacy protection, such as using zero knowledge proof technology, but this has also attracted attention from regulatory agencies and law enforcement agencies, as stronger privacy may breed illegal behavior.

#### **(2) Technical vulnerabilities and system errors**

Firstly, technical vulnerabilities may lead to system instability and financial losses. In the history of digital currencies in the past, there have been some technical vulnerabilities and system errors, such as DAO attacks on the Ethereum network, resulting in the theft of millions of dollars in digital assets. Secondly, system errors may affect the availability and security of digital currencies. For example, if the system of a digital currency exchange is attacked or malfunctions, users may lose control of their digital assets.

### 3 Opportunities created by digital currency for international financial stability

#### 3.1 Financial Innovation and Inclusion

##### (1) Popularization of financial services

Firstly, digital currency provides a cross-border financial service platform. According to data from the World Bank, there are still approximately 170 million adult people worldwide who do not have bank accounts, and digital currency can provide financial services for this population. The transaction process is shown in Figure 2. Secondly, digital currency can also promote financial innovation. FinTech companies are actively utilizing the convenience and security of digital currency to develop innovative financial products and services. According to statistics, as of 2021, the market value of FinTech companies worldwide has exceeded \$1.4 trillion, reflecting the positive impact of digital currency on financial innovation.



**Fig. 2.** Schematic diagram of digital currency transaction process

##### (2) Improving financial inclusivity

Firstly, digital currency has expanded the coverage of financial services. According to data from the International Telecommunication Union (ITU), as of 2021, the number of global internet users has exceeded 4.5 billion, accounting for 58% of the global population. This demonstrates the widespread coverage of the Internet, providing a foundation for the popularization of digital currency. Secondly, digital currency provides low-cost options for financial services. According to the Global Findex, approximately 110 million adults engaged in financial transactions through mobile payment accounts in 2017, and this number may have further increased since then. These digital currency accounts usually do not need to maintain monthly fees or minimum deposit requirements, so they are more in line with the needs of low-income groups [3].

### 3.2 Payment efficiency and cost reduction

#### (1) Improving cross-border payment efficiency

Firstly, digital currency can achieve instant payment. According to data from the World Bank, traditional cross-border payments typically take 3-5 working days to complete, while digital currency transactions can be completed within seconds. For example, the block confirmation time of Bitcoin is usually around 10 minutes, which greatly improves the liquidity and availability of funds. Secondly, the transparency and security of digital currencies help reduce payment risks, and encryption technology ensures the security of users' transactions and funds. According to data from research firm CipherTrace, the amount of digital currency theft worldwide decreased by 57% in 2020, indicating that the security of cryptocurrencies is constantly improving.

#### (2) Reduce transaction costs

Firstly, cross-border transactions of digital currencies typically do not require multiple currency exchanges. According to data from the International Monetary Fund (IMF), the amount of cross-border transactions involved globally is approximately \$150 trillion per year. In traditional financial systems, these transactions may require multiple currency exchanges, each of which carries additional exchange rate fees and instability risks. The direct use of digital currency can reduce these costs and improve the efficiency of cross-border transactions. Secondly, the transaction costs of digital currencies are usually lower. According to data from the International Monetary Fund (IMF), traditional cross-border remittance costs typically reach over 7%, while the use of digital currency can reduce these costs to less than 1%, thereby saving individuals and businesses a lot of money <sup>[4]</sup>.

### 3.3 Financial Data and Analysis Opportunities

Firstly, big data analysis can help financial institutions better understand market trends and investor behavior. According to Statista's data, the value of the global big data and business analytics market reached \$18.91 billion in 2019 and is expected to grow to \$27.43 billion by 2025. This indicates that the big data analysis market is rapidly expanding, providing financial institutions with more opportunities to utilize digital currency data for analysis. Secondly, big data analysis can be used for anti fraud and security monitoring. According to CipherTrace data, the number of global digital currency fraud cases decreased by 57% in 2020, indicating the effectiveness of big data analysis in combating fraud <sup>[5]</sup>.

## 4 Case analysis

China has been piloting the digital renminbi (eCNY) since 2020, becoming the first country in the world to promote the central bank digital currency (CBDC) on a large scale. The eCNY pilot project covers multiple cities and regions, attracting a wide range of users and enterprises to participate.

#### 4.1 Challenge Analysis

(1) Cross border regulatory and compliance issues. According to data from the People's Bank of China (PBOC), as of the end of 2022, the eCNY pilot has expanded to over 20 cities, covering various fields of use, from transportation to retail. China's eCNY pilot program may trigger international regulatory issues. China is actively promoting the pilot of digital renminbi, but other countries have inconsistent positions and regulatory policies on digital currencies. This may lead to legal uncertainty in international cross-border transactions.

(2) Inflation and depreciation risks. As of the end of 2022, the number of eCNY pilot users has reached millions, with a total transaction amount of over 1 billion RMB. This indicates that eCNY has been widely circulated in China, triggering market demand. Due to restrictions on the total supply of eCNY, the demand for it in the market may exceed the supply, thereby increasing its price, which may lead to inflation or price fluctuations.

#### 4.2 Opportunity Analysis

(1) Financial innovation and inclusivity. ECNY provides opportunities for financial innovation in China, providing financial services to people without bank accounts and promoting financial inclusiveness. According to data from the National Bureau of Statistics of China, as of the end of 2022, there are still hundreds of millions of people in China who do not have traditional bank accounts, but they can participate in financial transactions through eCNY.

(2) Payment efficiency and cost reduction. ECNY can improve the efficiency of cross-border payments and reduce transaction costs. Its use can accelerate domestic and international payments and improve the liquidity of funds. According to data from the People's Bank of China, eCNY's block confirmation time is usually within seconds, which has a significant payment efficiency advantage compared to the traditional cross-border remittance time of a few days.

In short, China's digital RMB pilot project has brought challenges and opportunities to international financial stability. It faces regulatory and inflationary risks, but also provides new opportunities for financial innovation, financial inclusiveness, and reducing transaction costs.

### 5 Conclusion

In summary, the development of digital currency has brought complex and diverse challenges and opportunities in the international financial field. Only through cooperation and innovation, fully leveraging the advantages of digital currencies and effectively addressing their risks, can the international financial system better achieve stability and sustainable development. Digital currency will continue to play an important role in the financial field and requires joint efforts from all parties to ensure that its positive role in international financial stability is maximized.

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