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MONETARY POLICY, CENTRAL BANK DIGITAL CURRENCY: A STUDY IN VIETNAM

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Abstract

Various forms of digital currencies are garnering attention from governments and the public due to their high-security potential, at least in theory. However, the widespread application of digital currencies in payments can pose potential threats such as fraud and cybersecurity risks, as well as a loss of control over a nation's financial and monetary stability. Therefore, Central Bank Digital Currencies (CBDCs) have been introduced to address the shortcomings of physical fiat currency and cryptocurrencies. Utilizing a research synthesis approach with the compilation of real-world events, this study aims to discuss the benefits and risks associated with digital currencies and the issues arising from physical fiat currency and circulating cryptocurrencies in the economy. It presents some potential advantages of CBDCs issued by central banks, analyzes monetary policies in the world of widely adopted CBDCs, and provides a reference CBDC design to bring economic benefits.

Keywords: CBDC, Monetary Policy, Financial Stability, Payment System.

1. INTRODUCTION AND OVERVIEW

The emergence of digital currencies like Bitcoin and distributed ledger technology, especially blockchain, has recently attracted significant attention from the public, investors, and policymakers. This development has had a substantial impact on the financial system and, more broadly, the entire economy. Therefore, in recent years, regulatory agencies and central banks in various countries have been closely monitoring and updating the developments in digital currencies, researching their impact on the payment system, financial stability, and the effectiveness of national monetary policies. In general, if digital currencies become widely used in transactions and payments, traditional payment channels such as banking systems, credit cards, and other payment methods may face significant disadvantages. Consequently, risks arise when central banks or governments cannot control these payment transactions.

The global economy is witnessing a rapid technological transformation. The combination of new digital technologies and increasing online transaction activities allows for the collection, management, and transmission of vast amounts of data. This significantly reduces the transaction costs for many tasks (Goldfarb & Tucker, 2019). Powerful, highly scalable applications have been developed and have an impact on the entire industry and how we live - from taxis to printing services. New players have entered the digital economy to provide these services. Furthermore, the COVID-19 pandemic may have accelerated the pace of digital change even further.

A technological revolution is taking place within the financial system, even in the design of money. For example, in foreign exchange (FX) markets, current market makers have the ability to access real-time prices at a 5-millisecond interval. The Rio project, a new market monitoring application developed at the BIS Innovation Hub, allows for the monitoring of all market order

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requests every 100 milliseconds or 36,000 times per hour.

Technology has first penetrated the payment services market - the platform for all economic activities. Payments are relatively attractive to those with expertise in digital disruption because they are relatively less capital-intensive than other financial services, and the information they generate is highly valuable for exchange. It is not surprising that our era is witnessing the explosion of digital innovation in payments, including new digital payment services from fintech startups and major technology companies (Bech & Hancock, 2020).

Recent technological advancements imply that central banks are considering providing digital currency to the public through accounts held on their ledger. Conceptually, this would expand the current reserve supply only accessible to public financial institutions. In this case, the central bank can be seen as a "narrow bank" providing accounts to the public and allowing account holders to use their balances to make payments through the central bank's ledger. This is considered the establishment of a Central Bank Digital Currency (CBDC).

Experts believe that CBDCs could support monetary policy effectively, allowing governments and central banks to directly access real-time information and data. Furthermore, this system can be seen as a responsibility and duty of the central bank. Moreover, a blockchain-based interbank payment system will have opportunities for faster, more transparent, and verifiable operations. Recent research by the Bank of England (BoE) has concluded that a widely adopted CBDC can "reinforce and enhance the transmission of monetary policy changes to the real economy."

In the context of the rapid development of digital currencies and the potential high risks, the questions of interest are (i) in the context of the rapid development of digital currencies, should central banks issue digital currencies for widespread public use? (ii) What advantages does CBDC have over physical fiat currency and digital currencies? (iii) What will monetary policy look like in a future where central bank digital currencies are widely used? and (iv) how can central banks design digital currencies to fit the economy?

This study will summarize and synthesize previous research on central bank digital currencies, combined with comparisons to real-world developments of these currencies. Additionally, it will provide specific examples and real-world events to illustrate these relatively new research concepts.

In the following sections, the study will present the risks and benefits of digital currencies, leading to an argument for the necessity of central bank-issued digital currencies (CBDCs). Next, the study will discuss the potential issues that may arise if physical fiat currency, digital currency, and CBDCs coexist. These discussions will lead to suggestions for an efficient CBDC system. Finally, the study will provide policy recommendations to enhance the effectiveness of CBDCs in the economy and mitigate risks in the era of cryptocurrency proliferation.

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2. RISKS AND BENEFITS OF DIGITAL CURRENCY

First, the study synthesizes and analyzes the drawbacks and advantages of digital currency. Based on this, the next section will provide reasons why a central bank and government of a particular country should consider using digital currency (CBDC), as opposed to developing an electronic form of fiat currency or not using digital currency (also known as cryptocurrency) as a widespread transaction basis.

Most research and practical discussions have focused on the speculative aspects of various types of digital currencies, thereby posing risks to financial stability and monetary policy. In a Federal Reserve paper, Badev and Chen (2014) argued that Bitcoin is primarily held by investors and is not seen as a means of payment. In 2017, Bitcoin saw a 400% price increase, leading to concerns about the Bitcoin price bubble. The price of Bitcoin has been highly volatile (fluctuating by several tens of percentage points), making investments in Bitcoin and other cryptocurrencies very risky. For example, in a very short period (just a few days), the price of Bitcoin reached nearly $60,000 per Bitcoin, dropped to $40,000 per Bitcoin, and then quickly recovered to $50,000 per Bitcoin. Consequently, the price of Bitcoin largely depends on expectations of price increases and may experience sharp reversals. However, during the rapid development phase of digital currencies, the most significant financial stability risks seem to be possibilities rather than realities. The risk to financial stability from digital currencies, currently or in the near future, may concentrate in economies where currencies are used more frequently because people trust fiat currencies or digital currencies that allow individuals to evade capital controls. In such cases, a rapid and significant drop in the value of a currency could lead to widespread losses, even panic, especially when payment intermediaries provide credit to support speculation (Nelson, 2018).

Furthermore, central banks or financial service intermediaries may have to compete with digital currency providers in traditional services. For instance, holding digital currencies as investment tools can make investors less enthusiastic about saving money in banks, even though bank savings accounts are relatively safe but offer lower interest rates. Moreover, if a significant portion of the population accepts the use of digital currency in essential life transactions, it may limit the government's control and increase the power of financial intermediaries and fintech companies that initiate and have a strong community of users in their own digital currency transactions. This poses a challenge for central banks to control the volume of money in circulation in the form in which it exists to enforce monetary policy effectively. If an economy operates partially with digital currencies and fiat currencies, where digital currencies have a floating exchange rate, central banks seem to be able to regulate business cycles and control the nominal interest rate of fiat currency but with lower accuracy, as the volatility comes from the digital currency aspect of the economy.

Additionally, some risks related to technological issues and underground activities may occur. Digital currency transactions and trading activities are based on complex technology platforms and modern technology devices, so lack of understanding of the system can lead to investor losses or, if there are system trading failures or personal data breaches, it can lead to increasing cybercrimes. The anonymity of digital currencies can be exploited for illicit activities such as

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money laundering, tax evasion, terrorist financing, and hacking.

Digital currency is provided in a fixed quantity or is externally determined according to currency demand. An economic and financial fluctuation will be magnified. If the quantity of digital currency is fixed, and the economy widely accepts digital currency (cryptocurrency), as the economy grows, the real value of each unit of currency will increase. In other words, the prices of goods in currency terms will decrease, and there will be deflation, often related to an inefficient economy. Businesses and households tend to cut their spending because goods will be cheaper in the future than they are now, thereby restraining economic activity.

However, one cannot deny the benefits that digital currency brings to investors and the economy. Firstly, based on blockchain technology and cryptography, transactions involving digital currency are highly secure and confidential.

Secondly, digital currency revolutionizes payment and transaction activities through direct execution of digital currency transactions (not limited by national geography), quickly, 24/7, especially without relying on any approving intermediaries. Furthermore, digital currency does not limit the transaction amount, has low costs, and simple transaction operations. Therefore, digital currency promotes convenient payment transactions based on its payment technology advantages.

Thirdly, the development of digital currency and modern payment revolution significantly contributes to e-commerce (especially global e-commerce) and fintech development. More and more private entities with access to modern technology, particularly technology startup companies, participate more in providing digital currency services in the fields of information technology, banking, and telecommunications.

Fourthly, digital currency can enhance the efficiency of monetary operations. For example, it reduces costs associated with the issuance and circulation of fiat currency. Additionally, to some extent, it helps precisely control the money supply in real time. If the economy transitions entirely to a central bank's digital currency, zero lower bound on the nominal interest rate can be entirely eliminated. Central banks can pay negative interest rates on accounts, making their policy rates as low as needed for necessary economic stimulation, at least in principle. However, I doubt that there may be insurmountable political barriers if the public is forced to hold digital cash and then pay interest on it.

The analysis of the advantages of digital currency shows that the technology platform behind this type of currency is suitable and is the main driving force for its development. This technology platform provides convenient, unrestricted, secure, and highly confidential transactions, promotes the development of e-commerce, reduces the cost of managing state currency, and enhances the efficiency of monetary operations. Regarding the disadvantages, digital currency is being questioned due to its price "bubble" and the difficulty of control by central banks and governments. Based on these analyses, the next section provides reasons why central banks may choose to issue digital currency, which is essentially a "digital version of fiat currency," instead of digital currency or cryptocurrency.

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3. THE ISSUE OF FIAT PAPER CURRENCIES AND DIGITAL CURRENCIES PROVIDED BY THE PRIVATE SECTOR

First, let's consider the characteristics of digital currency for comparison with fiat currency. There are four characteristics that help distinguish digital currency from other forms of currency. First, digital currency must be legal tender. Second, digital currency can be issued by banks or non-bank organizations. Therefore, to ensure the safety of users, countries have strict regulations on organizations that issue digital currency. For banks, central banks impose strict regulations on ensuring operational safety, risk control, maintaining mandatory reserve ratios, and insuring customer deposits. For non-bank organizations, central banks also tightly regulate licensing, supervisory enforcement, and require them to maintain reserves in the banking system (corresponding to the amount of issuance at a certain exchange rate set by the state). Third, digital currency is backed by the central bank (referred to as the monetary regime). Therefore, banks wishing to issue digital currency must have a certain amount of currency guaranteed by mandatory reserves held at the central bank. Typically, this ratio is higher than the required reserve ratio as defined. Fourth, digital currency is held in the form of digital technology devices such as (i) hardware-based products and (ii) software-based data.

Fiat paper currency is widely used for transactions, but it cannot avoid disadvantages in performing payment functions. Although fiat paper currency is convenient and can be used for immediate payments, it cannot support fast and remote payments, nor can it be applied to high-value payments due to its physical limitations. Payments through the central bank's reserve account are only applicable to payments and settlements between financial institutions. To overcome this limitation, a multi-tiered payment system established by the private sector, including payments through banks and third-party payments (TPP), has contributed to the diversity of payment models and the expansion of the payment network. Banks can make remote payments using electronic devices and Electronic Data Interchange (EDI) systems. TPP provides participants in the payment market with front-end and back-end payment operations, using modern information technology. This helps improve gaps in online payments and extends to offline retail businesses based on technical innovations in mobile payments, such as QR codes, thus further enhancing payment efficiency.

4. ANALYSIS OF THE BENEFITS OF CENTRAL BANK-ISSUED DIGITAL CURRENCY (CBDC)

Central banks typically issue two types of liabilities: physical banknotes and electronic central bank deposits, also known as reserves or settlement balances. Unlike physical banknotes, access to central bank reserves is usually restricted to qualified financial institutions operating within the large-value payment system. These electronic transfers correspond to nearly all non-cash transactions in the economy. And because these electronic transfers reside as liabilities of the central bank on the central bank's ledger, they are almost risk-free and non-reversible. Therefore, the future of a "cashless" economy is gradually taking shape. Here are some benefits when the central bank issues its own digital currency:

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a. First, it ensures and meets the demand for non-cash payments for the public. b. Second, it can conduct monetary policy at below the current minimum interest rate and support monetary policy more flexibly. What happens if the central bank wants to lower the effective lower bound on interest rates? Because physical banknotes can serve as an alternative to interest-bearing financial instruments, depositors and investors have many ways to avoid instruments with negative interest rates, ultimately by holding cash. c. Third, it reduces overall risks and enhances financial stability. Banks accept savings deposits from the public as a responsibility to repay this capital based on savings deposit certificates. This source of capital is a store of value and a "means of payment" that banks use for economic agents who need to borrow capital to finance their operations. However, during a crisis, this "inside money" may shrink and become trapped inside the bank (possibly because borrowers are unable to borrow more debt), which can cause instability in the economy. Therefore, the government and central bank will have to tighten management controls and regulations to ensure the safety of the system. If individuals, businesses, and banks rely on CBDC, management and transactions will be more favorable, reducing overall risk.

d. Fourth, it enhances competitiveness in payments in several ways: (i) CBDC can provide an alternative solution to physical banknotes, checks, debit cards, and credit cards, online transfers, etc. Therefore, CBDC can provide more competitive retail payment capabilities. (ii) CBDC can also be used for high-value payments between banks and businesses, and thus can also create higher competition in high-value payments. (iii) CBDC can also facilitate access to the central bank's balance sheet for many financial or even non-bank institutions, making it easier for these companies to participate in the payment industry, promoting competitiveness.

CBDC brings significant benefits such as meeting the needs of a cashless society, reducing overall risks, enhancing financial stability, controlling the lower limit of interest rates, and increasing competitiveness in payments. In the next section, the study analyzes CBDC in the context of national monetary policy to see how the shortcomings of traditional monetary policy are addressed when CBDC is widely accepted and used.

5. ANALYSIS OF MONETARY POLICY IN A WORLD WITH WIDESPREAD CBDC ADOPTION

The traditional monetary system faces several challenges related to weak traceability, homogeneity, and real-momentness, which make the transmission of monetary policy inefficient. Weak traceability means that central banks find it difficult to track and monitor how money circulates. When implementing monetary policy, central banks only have a preliminary idea of the expected economic impact, but it is challenging to have concrete evidence whether the money flows into the asset market, the real economy, or the financial sector. As feedback from the market and the economy comes in, the subsequent response of the central banks tends to be delayed and limited in impact. Homogeneity implies that the only variable of paper money is its denomination. Therefore, traditional monetary policy can only make macro-level adjustments and change the relationship between the "quantity" and "price" of the total currency units, affecting the accessibility and cost of money for the private sector. In this case,

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it's challenging for central banks to achieve specific monetary supply goals. Real-momentness means that transactions and payments in legal tender occur at the actual current moment. Thus, central banks can only exercise real-time control over the currency at the present moment. It's difficult for central banks to decide whether money currently flows into the real economy to achieve anticipated policy goals. Therefore, a central bank's decision may be optimal at the present moment but not the best due to time lags. Studies show that digital currency makes the enforcement of monetary policy more effective. Stiglitz (2017) researched macroeconomic governance in the central bank's cryptocurrency system. To address the limitations of current monetary policy, the author proposes a credit auction mechanism, which would allow central banks to directly influence the lending behavior of commercial banks. This study suggests that CBDCs will provide entirely new functions for fiat money as CBDCs can be tracked and programmed. The traceability of CBDCs allows central banks to easily track and monitor how CBDCs circulate after issuance. Based on forward contingencies, CBDCs will help address challenges of traditional monetary policies, such as inefficiency in policy transmission, difficulties in controlling according to cycles, challenges in controlling the flow of money from the real to the virtual economy, and incomplete policy communication. First, time contingency reduces time lags in the process of transmitting monetary policy and prevents money from circulating outside the real economy. Second, sector contingency makes monetary supply more precise and increases the likelihood of achieving expected targets, supporting the implementation of structural monetary policies, preventing money from staying outside the real economy for too long, and improving the financial sector's service to the real economy. Third, loan rate contingency makes the transmission of policy interest rates to loans more effective and immediate. Fourth, economic state contingency creates a macro basis for cyclical adjustments in the interest rates of money that commercial banks borrow from central banks, facilitating the implementation of counter-cyclical economic policies. CBDC addresses the challenges of traditional monetary policy through four contingency institutions (time, sector, loan rate, and economic policy), so in the next section, the study presents the design proposal by Qian (2019) to establish a central bank's digital currency that helps overcome the limitations of traditional monetary policy.

6. DESIGNING CBDC TO BENEFIT THE ECONOMY

When CBDC is issued, central banks set various contingencies, including time, sector, loan rate contingencies, and economic policy contingencies. These contingency institutions are established at the time of currency issuance but take effect after the currency is supplied. After setting up the aforementioned contingencies, central banks issue CBDC to commercial banks through a credit auction mechanism. The CBDC system is programmed and stores information such as the contingencies set by the central bank, the policy interest rate determined at auction, and the difference between commercial loan rates and policy rates.

Assuming that, after the issuance of CBDC, a commercial bank lends money at time t1. The bank provides loan information to the CBDC system to request activation of CBDC. Based on the provided loan information, the CBDC system determines whether the loan meets the time, sector, and loan rate contingencies (as pre-set by the central bank based on its policy goals). If

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the contingencies are met, CBDC is activated; if not, it is not activated. With such a design, central banks can control the circulation of CBDC after issuance. This design of CBDC not only shortens the time lag in policy transmission but also allows for targeted money supply. The contingency institutions for activating CBDC are designed as follows:

1) Time Contingency: CBDC is activated when a loan is issued, or else it is not activated. The central bank can also pre-set the activation time when issuing CBDC, for example, if it is later than time t1, the loan will not be activated, to encourage commercial banks to issue credit before time t1. This time contingency can help minimize delays in policy transmission and prevent money from circulating outside the real economy.

2) Sector Contingency: CBDC is activated when it is lent according to the central bank's requirements, or else it is not activated. For example, CBDC is activated if it does not flow into the asset market. Sector contingency helps the central bank provide targeted money supply, allowing for systematic control, preventing money from flowing out of the real economy, and encouraging money flow from the virtual to the real sector.

3) Loan Rate Contingency: When issuing CBDC, the loan rates offered by commercial banks to businesses must equal the standard policy interest rate at time t1 plus a benchmark spread determined by the auction session at time t0. CBDC is activated if the actual interest rate provided by the bank matches the above formula; if not, CBDC is not activated. Loan rate contingency allows policy interest rates to have a real-time impact on lending rates.

7. CONCLUSION

Due to the limitations of legal tender and digital money in transactions, payments, and the implementation of monetary policy, central bank digital currencies (CBDCs) are being researched and deployed in some developed countries as part of the technological revolution towards a cashless society. This is a new topic with not much discussion yet to clarify the precise concepts related to the types of money in the economy, the expected changes in monetary policy with the advent of central bank digital currencies, and how to design such currencies to benefit the economy. These urgent issues are discussed in this study, thereby helping policy makers and scholars recognize the increasingly important role of digital currencies and their impact on the current monetary policy of central banks.

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