



## Analysis of the Potential Impact of Central Bank Digital Currency (CBDC) on Banking in Indonesia

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### ABSTRACT

This research aims to analyze the potential impact of implementing Central Bank Digital Currency (CBDC) on banking stability in Indonesia and identify factors that influence economic actors in using CBDC. This research used descriptive qualitative methods with literature studies. The data sources for research are bibliographic or come from various types of literature, including books, journals, articles, newspapers, modules, personal documents, etc. The research results show that implementing CBDC can reduce the number of deposits in banks, increase competition, and change banking business models. However, CBDCs can also improve financial inclusion and payment system efficiency. Factors that influence the use of CBDC include the level of trust, security, cost, and public literacy and education. The implication of this research is to enrich financial literature by introducing a new concept regarding digital money issued by central banks. In addition, the research results can be used to design risk mitigation strategies that may arise due to switching from cash to digital money.

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## INTRODUCTION

The development of payment systems, significantly influenced by financial technology (FinTech), has transformed how people conduct transactions, particularly with the rise of electronic money and digital currencies (Emanuella, 2021). Electronic money, such as e-wallets (e.g., Go-Pay, OVO, Dana), has gained popularity, especially during the COVID-19 pandemic, leading to a substantial increase in transaction values, reaching IDR 20.7 trillion in January 2021, a 30.7% rise from the previous year (Hartono, 2020; Lewis, 2018).

Cryptocurrencies represent another advancement, allowing for direct peer-to-peer online payments without intermediaries. However, these virtual currencies face scrutiny due to their decentralized nature and volatility, leading to a lack of accountability (Chuen & Low, 2018). As a response to the challenges posed by virtual currencies, Central Bank Digital Currencies (CBDCs) are being developed globally. CBDCs are regulated by central banks and aim to provide a safer alternative to virtual currencies, enhancing monetary stability. Countries like China and Sweden are actively testing CBDCs, with China's Digital Currency/Electronic Payment (DC/EP) and Sweden's e-krona leading the way (Weisbrodt & Gross, 2020). Meanwhile, Bank Indonesia is exploring the implementation of a CBDC to improve payment systems and mitigate risks associated with virtual currencies (Purnawan & Riyanti, 2019). The central bank has issued guidelines regulating electronic money and is assessing the advantages of CBDCs.

The potential benefits of CBDCs include increased efficiency in payment systems and improved transparency. However, the impact on financial stability and the design of CBDCs remain under discussion, acknowledging that each country's economic structure influences CBDC usage (Boar et al., 2020; Lukonga, 2023). While there is research on the general impact of CBDCs on banking, there is a gap in understanding how banking business models will adapt or change with the presence of CBDCs. Kim (2022) also stressed the need to analyze the risks associated with CBDC implementation in more depth, including factors that could affect the stability of the financial system. For Indonesia, considerations regarding Sharia compliance are crucial, as Islamic finance principles prohibit interest and speculation. The implementation of Central Bank Digital Currency (CBDC) in Indonesia must align with Sharia principles, which prohibit *riba* (interest) and *gharar* (speculation). These guidelines impact the design and use cases of the CBDC (Hamin, 2020). Previous research conducted by Muttaqin & Khasanah (2023) has not comprehensively explored how CBDC can be designed and implemented in the context of sharia principles, especially in a country with a significant Muslim population such as Indonesia. This indicates the need for a more in-depth approach to the implementation of CBDC by *maqashid sharia*.

## LITERATURE REVIEW

### *Cryptocurrency*

Cryptocurrency is a form of digital money designed to function as a medium of exchange over a computer network that is independent of a central

authority, such as a government or bank, to maintain or safeguard its value. Cryptocurrencies use distributed blockchain technology to record transactions and manage the issuance of new units of money. Cryptocurrency transactions are encrypted to prevent fraud and unauthorized transactions (Afrizal & Marliyah, 2021). The technology uses cryptography for security, so transactions cannot be changed and user identities remain anonymous. Devries (2016) explained that cryptocurrency has evolved in response to the need for a more transparent and decentralized financial system. They also highlighted the potential of cryptocurrency in financial inclusion, although there are still challenges in terms of regulation and security.

### ***Blockchain***

Blockchain is a distributed network technology that is an immutable and unalterable digital record. Blockchain consists of blocks containing encrypted transaction information linked using cryptographic hashes. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. Blockchain enables verified and secure transactions and ensures that data cannot be altered or misused by any party without the consent of the entire network. Blockchain can also be used to record transactions and manage valuable assets, such as physical or intangible assets, such as copyrights. Blockchain is very popular in cryptocurrency applications such as Bitcoin, as well as in various other industries such as logistics, finance, and law (Suryawijaya, 2023). Argani & Taraka (2020) said that blockchain allows for verification and security of transactions without the need for a third party.

### ***Potential***

In the Kamus Besar Bahasa Indonesia (KBBI), Potential is the ability that can be developed, strength, capability, and power. According to Prof. DR. Buchori Zainun, MPA, what is called potential is power or strength that has been actualized but not yet optimal or has not been actualized (Utama, 2018). Potential is not only about current capabilities, but also about possible future developments. Amaliyah & Rahmat (2021) emphasized that the potential of new technologies, such as CBDCs, should be evaluated in the context of their impact on the existing financial system and how they can facilitate economic development.

### ***Central Bank Digital Currency (CBDC)***

CBDC is a digital currency issued and controlled by a central bank and used as a legal tender. In its implementation, CBDC adopts the basic technology of cryptocurrency, namely Distributed Ledger Technology (DLT) or blockchain technology (Maulana, 2023). Although CBDC uses the same technology as cryptocurrency, there is a fundamental difference between CBDC and cryptocurrency, namely in terms of the type of blockchain used, CBDC is centralized, while crypto is decentralized. Then the most important and most different from crypto is that the network and rules of CBDC are determined by

the central bank so that the circulation of CBDC will be more controlled. CBDCs aim to improve the efficiency of payment systems and provide a safer alternative to cryptocurrencies. CBDCs allow central banks to more effectively control the money supply and manage monetary policy and can increase transparency in transactions (Muhammad & Dirkareshza, 2023).

### Banking

Banks are institutions that offer financial services such as credit, reserve funds, installments for administration and carry out other monetary roles professionally and sustainably. Progress is entirely determined by the ability to identify service requests from public finance, and then effectively service and market them at a reasonable cost (Regar et al., 2016). Banking is a financial institution that is important for a country's economy. A bank is a business entity that collects community assets as investment funds and channels them back to the community through lending. The operations of general banks such as financial intermediaries are preparing assets from the local area to be distributed to additional individuals or companies that need cash in the form of loans or credit (Triandaru & Budisantoso, 2006).

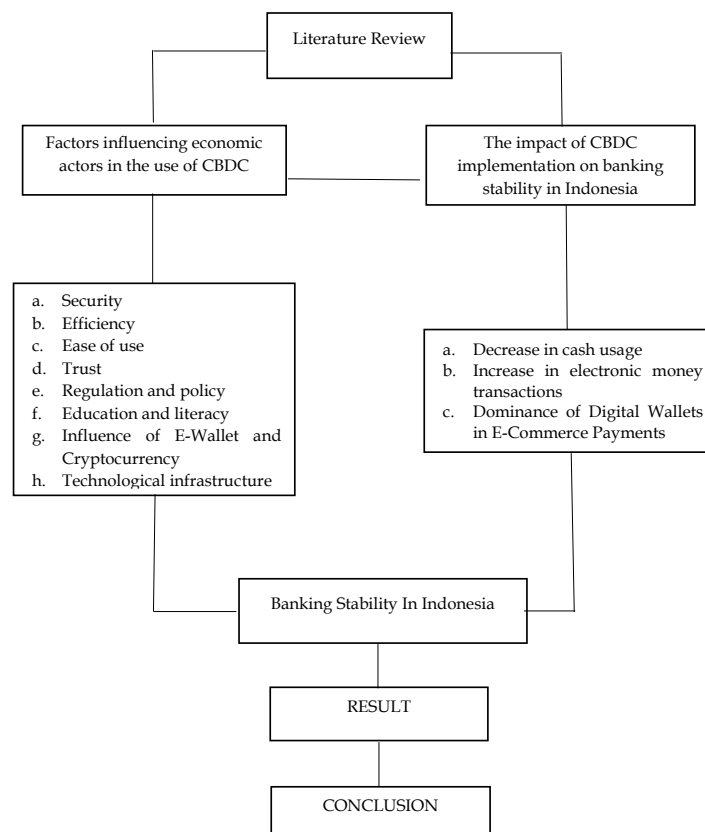


Figure 1. Conceptual Framework  
Source: Data Processed by Author (2024)

### METHODOLOGY

This research uses a qualitative descriptive research method, a type of literature review where researchers rely on various literature to obtain research data. The literature review method is a series of activities related to methods of

collecting library data, reading and taking notes, and managing previous research materials (Prasanti, 2018). The results of the compilation of several previous studies are used to conclude how the implementation of CBDC will impact banking stability in Indonesia.

The subject of this research is a book or scientific study related to the Central Bank Digital Currency (CBDC) phenomenon in the world. At the same time, the object of the research is related to the impact of CBDC itself. Primary data sources in this study were taken from books, articles, journals, and websites (internet) related to CBDC. At the same time, secondary data sources were obtained indirectly to raise primary data sources. In this study, the data taken were from books and other supporting scientific studies related to the main discussion, namely CBDC.

In qualitative research, data analysis is divided into 3 flows, namely data reduction, data presentation, and verification. Data redaction is collecting data to be simplified, sorted, and emphasized on the most important and relevant information to answer research questions. This process involves eliminating irrelevant data, identifying patterns or themes that emerge from the data, and organizing the data in a more structured format. Data presentation is the process of presenting simplified information clearly and meaningfully. Conclusions are made to confirm the accuracy, consistency, and reliability of the data that has been collected and analyzed.

## RESEARCH RESULT

### *Payment Transaction Growth*

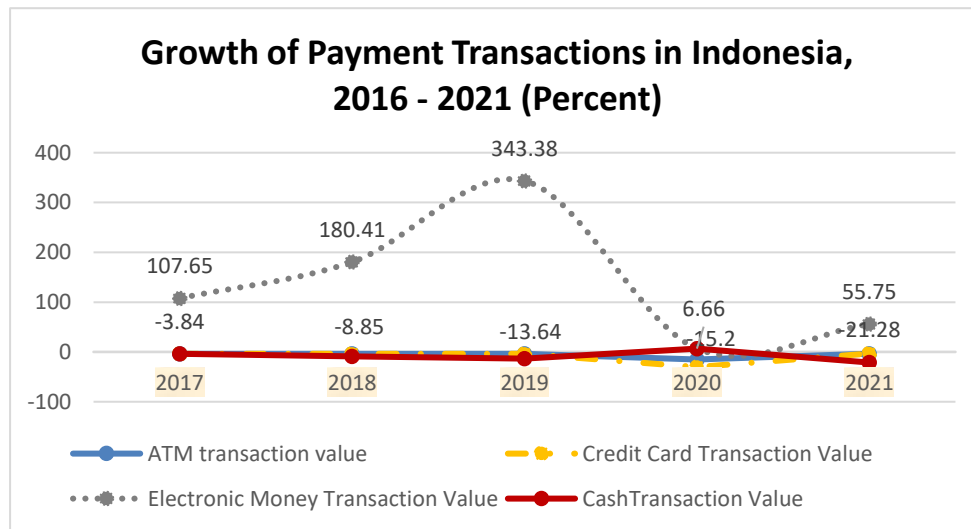


Figure 2. Payment Transactions in Indonesia, 2016 - 2021

Source : Bank Indonesia (2022)

Data from Bank Indonesia shows a downward trend in the use of cash in financial transactions. In 2016, total cash transactions reached 3,511.34 trillion rupiah. However, this number experienced a significant decline in 2021 to 2,410.71 trillion rupiah, which is a decline of 31.35% in five years. This decline shows a shift in people's transaction patterns from cash to more modern and efficient forms of payment. In 2021, the total value of electronic money

transactions was recorded at IDR 786,347 billion, which shows an increase of 57.74% compared to 2020. This increase reflects the increasingly widespread adoption of digital payment methods in Indonesia.

### *Potential Impact of CBDC on Banking Stability in Indonesia*

Table 1. Potential Impact of CBDC on Banking Stability  
in Indonesia

<b>Potential Impact of CBDC on Banking Stability in Indonesia (Conventional &amp; Sharia)</b>	
Positive	Negative
Improve payment system efficiency by reducing transaction costs and processing times.	Affecting bank revenue from payment and transaction services.
Maintaining balance in the financial system.	A decrease in deposits (savings and time deposits) in banks can reduce the bank's liquidity base.
More value-added business model changes that a CBDC cannot provide.	Declining market share and competitiveness for banks that cannot innovate or adapt their business models.
Opportunities for the development of new products and services that leverage technology.	Risk of inflation or deflation if CBDC management is not careful.
Central banks will have new tools to control the money supply and influence interest rates.	Privacy leaks, data security, and potential for abuse if proper regulations are not developed.
Increasing the efficiency of the payment system, improving risk management, and strengthening public confidence in the financial system.	Systemic risks, such as high volatility or market instability.

This table presents an analysis of the potential impact of Central Bank Digital Currency (CBDC) on banking stability in Indonesia, both for conventional banks and Islamic banks. In this table, the impacts are divided into two main categories: positive impacts and negative impacts.

### *Factors influencing economic actors in the use of CBDC*

Table 2. Factors influencing economic actors in the use of CBDC

<b>Factors influencing economic actors in the use of CBDC</b>	
Security	<ul style="list-style-type: none"> <li>• Data Protection</li> <li>• Transaction Integrity</li> <li>• Protection against Cyber Attacks</li> </ul>
Efficiency	<ul style="list-style-type: none"> <li>• Transaction Speed</li> <li>• Transaction Cost</li> </ul>
Ease of Use	<ul style="list-style-type: none"> <li>• User Interface</li> </ul>

	<ul style="list-style-type: none"> <li>• Accessibility</li> </ul>
Trust	<ul style="list-style-type: none"> <li>• Value Stability</li> <li>• Management by Central Bank</li> </ul>
Regulations and Policies	<ul style="list-style-type: none"> <li>• Usage Policy</li> <li>• Anti-Fraud Regulations</li> </ul>
Education and Literacy	<ul style="list-style-type: none"> <li>• Education Programs</li> <li>• Information Sources</li> </ul>
The Influence of E-Wallet and Cryptocurrency	<ul style="list-style-type: none"> <li>• Comparison with E-Wallet</li> <li>• Competition with Cryptocurrency</li> </ul>
Technology Infrastructure	<ul style="list-style-type: none"> <li>• Infrastructure Availability</li> <li>• Integration with Financial Systems</li> </ul>

Source : Bayu, N.K. (2019)

This table identifies various factors that influence economic actors' decisions to adopt Central Bank Digital Currency (CBDC). Each factor listed reflects an important aspect that can determine the level of acceptance and use of CBDC.

## DISCUSSION

### *The impact of the implementation of Central Bank Digital Currency (CBDC) on banking stability in Indonesia*

According to Hendarsyah (2016), the digitalization of money has significantly changed financial transactions, and its impact can be seen in the statistics of cash and electronic money usage in Indonesia. Several factors influencing the decline in cash usage (figure 2) include technological advances, improvements in digital infrastructure, and changes in consumer preferences that increasingly tend to choose more practical and secure payment methods. Digitalization enables faster transactions and reduces the need for handling physical money, which is often involved in risks such as loss, theft, or damage. Electronic money, which has experienced rapid growth, is driven by the convenience and speed offered by electronic money. With electronic money, transactions can be made in seconds without having to wait in line at the bank or shop. In addition, electronic money reduces dependence on cash and allows users to make transactions from anywhere, as long as they have access to a device that supports an electronic payment system (Woetzel et al., 2021). Statista data shows that digital wallets dominated the e-commerce payment market in 2020, accounting for 38% of all e-commerce payments. This shows that digital wallets are the main choice for consumers in making online transactions, given their ease in managing and tracking expenses.

CBDC, as a digital currency issued by a central bank, has the potential to fundamentally change the structure of the payment system. This is in line with the results of research conducted by Emanuella (2021), which noted that the digitalization of money, including CBDC, has the potential to speed up transactions and reduce dependence on cash. Previous research also shows that this increase in efficiency is very important amid the increasing adoption of

digital payment technology in Indonesia, especially during the COVID-19 pandemic. CBDC can reduce dependence on banks and financial institutions by enabling direct transactions between users and the central bank (Luu et al., 2023). However, this change may also affect bank revenues from payment and transaction services. Banks that have been profiting from transaction fees and related services may face financial pressure if CBDC reduces their role in the process. If people prefer to keep their money in the form of CBDC rather than bank deposits, this could lead to a decrease in deposits in those banks. This decrease in deposits could reduce the liquidity base of banks (Auer et al., 2022). Central banks can manage this risk through flexible monetary policy, such as setting interest rates on CBDC or setting limits on the amount of CBDC that an individual or entity can hold.

On the positive side, CBDCs offer banks the opportunity to improve operational efficiency and expand access to financial services. Additionally, CBDCs can enhance financial inclusion by providing better access to populations that are unserved or underserved by the traditional financial system. Research conducted by Hasan (2022) that CBDC can influence monetary policy and regulation. With CBDC, the central bank will have a new tool to control the amount of money in circulation and influence interest rates. In addition, systemic risks that may arise from the implementation of CBDC are a major concern. As noted by Kim et al. (2022), an in-depth risk analysis is essential to understand the impact of CBDC on the stability of the financial system. This study shows that if CBDC is not managed properly, it can lead to detrimental inflation or deflation. This study emphasizes the need for strict regulation and flexible monetary policy to address these risks, in line with recommendations from previous studies.

### ***Central Bank Digital Currency (CBDC) Under Review of Maqashid Syariah***

Benefits in maqashid sharia can be obtained if the five fundamental components can be understood and maintained. The five main ones are maintaining religion, maintaining the soul, maintaining the mind, maintaining offspring, maintaining property (Syarifuddin, 2008). To realize and uphold the five fundamental components, Al-Syatibi isolated them into three degrees of Maqashid or sharia goals, such as Maqashid Al-Daruriyyah, Maqashid Al-Hajiyyah, and Maqashid Al-Tahsiniyyah. Based on the Qur'anic proposition from Surah An-Nisa: 29, Allah SWT. says which means:

"O you who believe, do not falsely consume your neighbor's wealth, except in the form of commerce based on mutual consent between you. Do not kill yourselves. Indeed, Allah is Most Merciful to you."

Analysis of maqashid sharia in the issuance of digital rupiah brings more benefits than harms, if seen from the benefits, it is by the five indicators of maqashid sharia because this digital rupiah is issued to replace digital money such as crypto, bitcoin, stablecoins, etc., which will threaten the financial system in Indonesia. The harm that occurs is in the system that will regulate the digital rupiah, namely blockchain, which is also used by digital cryptocurrency, but there is a difference because in the digital rupiah the system will be combined

with the system of Bank Indonesia which will control this, namely Bank Indonesia. This shows that the digital rupiah currency is the same form but eliminates the bad elements contained in cryptocurrency, upholding Islamic law in saving the economy of the Muslim community by maqashid sharia (Ginanjar et al., 2023). The presence of CBDC can encourage Islamic banking to develop more creative products and services that are in line with customer needs. To ensure alignment between CBDC and the Islamic banking industry, Islamic banking can adapt by developing strategic partnerships with relevant authorities, such as regulators and central banks. This study strengthens Hamin's (2020) argument which shows that CBDC design must consider sharia aspects to ensure acceptance among the public.

### ***Factors influencing economic actors in the use of CBDC***

The success of CBDC implementation depends on several factors that influence economic actors' decision to adopt it. Security is the most critical factor in CBDC adoption. Given the increasing threat of cyberattacks and data security, CBDCs must have strong security protocols to protect transaction data and user identities from unauthorized access. In addition to security, an efficient CBDC is a factor that can reduce the time required to complete transactions and lower transaction costs. Lower costs will be an additional incentive for economic actors to switch to CBDC. The CBDC system must also be designed to be easily accessible and usable by various groups of people, including those who may not be familiar with technology.

CBDCs must have a stable value and not be easily affected by market fluctuations. This stability of value is important to ensure that CBDCs will be accepted as legal tender. In addition, clear and transparent policies will help economic actors feel more comfortable using CBDCs. Education and literacy about CBDCs are very important factors to ensure that economic actors understand the benefits and how to use CBDCs. Governments and central banks must provide educational programs to increase public understanding of CBDCs, how they work, and their benefits.

Established cryptocurrencies also influence CBDC adoption. Economic actors may consider using CBDC as a more stable and secure alternative to speculative cryptocurrencies. Economic actors will compare CBDC with existing e-wallets such as OVO, DANA, and Gopay. CBDC must offer additional benefits or features that are not available in e-wallets to attract users. In addition, adequate technological infrastructure must be available to support the use of CBDC, including a stable internet network and compatible devices. In the context of competition with e-wallets and cryptocurrencies, this study found that CBDCs must offer added value to attract users. As stated Bayu (2019), users tend to choose more stable and secure solutions. This study shows that to compete, CBDCs must-have features that e-wallets do not offer, such as higher transparency and security, as well as support from the central bank.

## **CONCLUSIONS AND RECOMMENDATIONS**

Overall, CBDC has the potential to change the structure of the payment system by enabling direct transactions between users and the central bank, which can increase efficiency but also affect conventional banks' revenues from transaction services. CBDC offers opportunities to improve operational efficiency, reduce transaction costs, and increase financial inclusion. This can contribute to banking stability in the long term if managed properly. However, CBDC can affect monetary policy and requires proper regulation to avoid systemic risks such as inflation or deflation. The experiences of other countries with CBDC can provide valuable insights for Indonesia in designing an implementation strategy that suits local conditions.

Based on our findings, Indonesia's central bank needs to develop a comprehensive policy on CBDC, including regulations to protect user privacy, address security risks, and manage impacts on bank liquidity. The technological infrastructure supporting CBDC must also be reliable and integrated with the existing financial system. The government should conduct in-depth trials and evaluations before the widespread launch of CBDC to identify and address potential risks that could affect financial system stability. This also includes monitoring and assessing CBDC implementation in other countries to gain additional insights. It is important to conduct a comprehensive public education program on CBDCs. This can include seminars, workshops, and information materials explaining the benefits, how to use, and security aspects of CBDCs. In addition, central banks should partner with private sector players, including financial technology (FinTech) companies and financial institutions, to develop user-friendly CBDC infrastructure and applications. This collaboration can accelerate innovation and increase the appeal of CBDCs among users. After the implementation of CBDCs, it is important to conduct regular monitoring and evaluation to measure the impact on financial stability and user behavior. Data obtained from these evaluations can be used to improve the design and policies related to CBDCs.

## **ADVANCED RESEARCH**

This research still has limitations. For further research, it is recommended that researchers include additional relevant variables, such as social and cultural aspects, to provide a more comprehensive understanding and develop insights into the potential impact of Central Bank Digital Currency (CBDC) on banking in Indonesia in the conventional and sharia scopes to readers.

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