

# Central Bank Digital Currencies and It's Potential Impact on the Profitability and Systems Stability of Commercial Banking in Emerging Markets

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## ABSTRACT

The development of Central Bank Digital Currencies (CBDCs) has become a significant topic of discussion globally, particularly in emerging markets where financial inclusion, monetary sovereignty, and banking stability are key concerns. This study explores the potential impact of CBDC implementation on the profitability and system stability of commercial banking systems in these economies. This research adopts a qualitative approach through a literature review of CBDC implementations in key emerging economies, including China, Nigeria, Brazil, Russia, and India. The study finds that while CBDCs can enhance efficiency and financial accessibility, their impact varies depending on a country's banking infrastructure, regulatory framework, and financial stability measures. In some cases, CBDCs have exacerbated liquidity risks for commercial banks, while in others, they have promoted digital innovation and alternative revenue streams. The findings highlight the need for strategic collaboration between central banks and commercial financial institutions to mitigate risks while leveraging the benefits of CBDCs. Policy recommendations include implementing limits on CBDC holdings, integrating CBDCs with existing banking services, and fostering regulatory frameworks that support a balanced financial ecosystem. This study contributes to the academic discourse on digital currencies and banking by offering insights into the evolving role of central banks and commercial banks in the digital financial landscape.

**Keywords:** Central Bank Digital Currency (CBDC); Commercial Banks; Profitability, Emerging Markets; Digital Finance.

**JEL Classification:** -

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## INTRODUCTION

Central bank digital currencies (CBDCs) have become a major focus for many countries in recent years, especially in response to the development of financial technology and the increasing popularity of cryptocurrencies (Koonprasert et al., 2024). CBDC, which is a digitized form of fiat currency issued by the central bank (Noviyanti et al., 2024), aims to improve payment efficiency, expand financial inclusion (Supriyanto, 2024), and maintain monetary control (Foster et al., 2021) amidst competition with digital assets.

Several countries have taken the lead in CBDC development, such as China with its e-CNY which has been piloted in major cities, and Nigeria which launched eNaira as Africa's first CBDC. In addition, The Bahamas became the first country in the world to launch a CBDC, Sand Dollar, in 2020 with the aim of improving financial access in its island territory (Bharatan, 2020). On the other hand, countries such as the European Union and the United States are still in the research stage, with the European Central Bank (ECB) developing a digital euro and the Federal Reserve studying the potential of a digital dollar. The motivations behind the development of CBDCs vary, ranging from reducing reliance on cash to maintaining monetary sovereignty in an increasingly digitized global financial system (Morales-Resendiz et al., 2021).

For emerging markets, central bank digital currencies (CBDCs) offer a great opportunity to address many of the economic and financial challenges that have been holding back growth. One of the key benefits of CBDCs is to increase financial inclusion. In many developing countries, a large proportion of the population still does not have access to formal banking services (Persaud & Thaffe, 2023). With CBDCs, central banks can provide affordable and accessible digital payment systems, even for people in remote areas. For example, Nigeria has launched eNaira in 2021 with

the main goal of expanding financial access for its citizens (Adedipe, 2022).

On the other hand, the implementation of central bank digital currencies (CBDCs) has a potentially significant impact on the banking sector, especially in terms of profitability. One of the main impacts is disintermediation, where CBDCs could reduce the role of commercial banks as financial intermediaries (Noviyanti et al., 2024) (Lian et al., 2025). If the public chooses to deposit their funds directly in CBDCs at the central bank, commercial banks may lose sources of cheap funds such as deposits (Vollmar & Wening, 2024). This can increase banks' funding costs and reduce their net interest margin (NIM), which is a key source of income for many banks. In addition, CBDCs can shift payment transactions from the traditional banking system to the central bank's digital platform, reducing revenue from transaction fees and payment services.

The implications of central bank digital currencies (CBDCs) for the profitability of commercial banks in emerging markets are important to explore as CBDCs can be a tool to enhance financial stability by giving central banks more direct control over monetary policy (Morales-Resendiz et al., 2021). However, CBDC also has the potential to affect banks' income sources, both interest and non-interest income sources, which can reduce bank profitability if not managed properly.

The purpose of this study is to determine how the implementation of CBDC in emerging markets and to analyze the impact of such implementation on the profitability and system stability of commercial banks in emerging markets. The results of this study are expected to provide policy recommendations for commercial banks and regulators in emerging markets, to help them address the potential impacts of CBDC

implementation, thereby supporting financial stability and sustainable economic growth.

This research has important significance both academically and practically. Academically, it contributes to the monetary and banking economics literature by filling the knowledge gap on the impact of central bank digital currencies (CBDCs) on commercial bank profitability, particularly in emerging economies, which remains under-explored. Practically, this research provides tangible implications for commercial banks and regulators. Thus, this research not only enriches academic insights but also provides practical solutions in the face of digital transformation in the financial sector.

## LITERATURE REVIEW

### Central Bank Digital Currencies (CBDC)

Central bank digital currencies (CBDCs) are digital forms of fiat currencies issued and regulated by a country's central bank (Fadhilina et al., 2024). CBDC can be divided into two main types: retail CBDC and wholesale CBDC (AFTECH, 2024).

#### a. CBDC Ritel

Retail CBDC is designed to be used by the public in everyday transactions, such as retail payments, money transfers, and purchase of goods/services. The aim is to provide a safe and efficient digital alternative to cash, while increasing financial inclusion by giving unbanked populations access to formal payment systems. Examples: e-CNY (China), eNaira (Nigeria), and Sand Dollar (Bahamas).

#### b. Wholesale CBDC

Wholesale CBDC is intended for use by financial institutions, such as commercial banks and other financial institutions, for interbank transactions and settlement of large financial transactions. The goal is to improve efficiency and security in wholesale payment systems, such as the settlement of securities

transactions and cross-border payments. Example: Project Jasper (Bank of Canada) and Project Ubin (Monetary Authority of Singapore).

The main difference between the two is how they are used. Wholesale CBDC is used for large financial transactions between institutions, while retail CBDC is used for ordinary public transactions. Despite their different purposes and effects, both forms of CBDC have the potential to revolutionize the financial system.

In terms of management, value and purpose, CBDCs differ significantly from other digital currencies such as cryptocurrencies and stablecoins. A country's central bank issues and regulates CBDCs, making them centralized (Pratomo, 2024). It has a stable value as it is backed by the country's fiat currency (for example, e-CNY is backed by the Chinese yuan). Its purpose is to improve payment system efficiency, support monetary policy, and increase financial inclusion. (Zuchroh et al., 2025). Whereas other digital currencies such as Cryptocurrencies are decentralized and are not controlled by a single authority, such as a central bank or government (Noviyanti et al., 2024). Its value is highly volatile as it is determined by the market, for example, Bitcoin, Ethereum. The goal focuses more on providing an alternative financial system that is independent of traditional authorities (De Filippi & Loveluck, 2016).

Stablecoins, while digital like cryptocurrencies, are designed to have a stable value because they are backed by a specific asset, such as fiat currency (for example, USDT is backed by the US dollar) or a commodity. Stablecoins are managed by private entities, not central banks. Its purpose is to facilitate digital transactions by reducing the volatility commonly associated with

cryptocurrencies. Examples of stable coins are USDT (Tether), USDC (USD Coin).

### Financial Disintermediation Theory

The theory of financial intermediation refers to the process by which the traditional role of banks as intermediaries between those who have funds (investors) and those who need funds (businesses) is reduced or even eliminated. This occurs due to changes in the way investors and businesses interact and utilize financial markets (Wibowo & Gunawan, 1998).

The theory of financial disintermediation emphasizes several important points, namely (Wibowo & Gunawan, 1998):

1. **Influence of Technology and Liberalization:** The development of information technology and liberalization of financial markets allow investors and businesses to interact directly without going through banks. This includes the use of crowdfunding platforms, peer-to-peer lending, and more open capital markets.
2. **Reduction in Transaction Costs:** With intermediation, transaction costs can be reduced due to the reduction in the role of banks as fee-taking intermediaries. This can improve efficiency in fund allocation.
3. **Increased Financial Inclusion:** Disintermediation can open access to funds for businesses that previously found it difficult to obtain credit from traditional banks, such as micro, small, and medium enterprises (MSMEs).
4. **Risk and Financial Stability:** While disintermediation brings many benefits, there are also risks being faced, such as increased credit and financial stability risks due to the lack of strict supervision by banks.
5. **The New Role of Banks:** Banks still have an important role in the financial system, but their role is changing to focus more on other

financial services such as asset management, insurance, and digital financial services.

The theory of financial disintermediation shows how technology and regulatory changes can alter the dynamics of the financial system and provide new opportunities and challenges for the various parties involved.

### Bank Profitability

Bank profitability is the bank's ability to generate profits from its operational activities (Fahru Rachman et al., 2023). The three main metrics often used to measure bank profitability are Return on Assets (ROA), Return on Equity (ROE), dan Net Interest Margin (NIM) (Desvianti et al., 2024) (Nugroho et al., 2024). Return on Assets (ROA) measures how efficient a bank is in generating profits from its assets (Nugroho et al., 2024). ROA is calculated by dividing net income by average total assets. A higher ROA indicates that the bank is using its assets efficiently to generate profits (Pratiwi et al., 2024) (Akhyar Nurdin, 2023). Return on Equity (ROE) measures how efficient a bank is in generating profits from its equity or capital (Wairisal, 2024). ROE is calculated by dividing net income by average total equity. A higher ROE indicates that the bank is using its equity efficiently to generate profits (Putra et al., 2024). Net Interest Margin (NIM) measures the difference between the interest income earned by the bank from loans and the interest fees paid by the bank to depositors, expressed as a percentage of the assets that generate interest (Dewi & Ghalib, 2024). A higher NIM indicates that the bank has a larger profit margin from its lending activities compared to the fees it has to pay for the funds it obtains (Warno & Farida, 2017)

Previous research on CBDC has been carried out, including research by Beckman et al. which revealed that CBDC will have a negative impact on banks that depend on deposits (Beckmann et al.,

2024). Research by Vollmar and Wenning examined the implications of central bank digital currencies (CBDCs) for banks that use business models that rely heavily on customer deposits. Using unique customer data collected directly from savings banks and cooperatives in Germany, they generate conversion value for deposits into CBDCs. Even at a moderate conversion rate, most banks will have funding problems and lose profits if CBDCs are introduced in most years from 2000 onwards (Vollmar & Wenning, 2024). Then, research by Foster et al. discusses the potential macroeconomic impact and regulatory challenges related to central bank digital currencies (CBDCs) and other digital currency initiatives in developing countries (Foster et al., 2021). In addition, research by Gao explains the background of the issuance, key features, technical architecture, and its impact on commercial banking operations and the regulatory system of China's Digital Currency Electronic Payments (DCEP or e-CNY) (Gao, 2024). The research by Morales et al aims to provide relevant lessons regarding the design, operation, and implementation of CBDCs (Morales-Resendiz et al., 2021). The study conducted by Niroula & Student aims to evaluate the effects of information treatment to improve consumers' perspectives on CBDCs and the credibility of central banks. The study also aims to explore potential consumer incentives for CBDC adoption and further investigate whether financial literacy is linked to CBDC adoption and central bank credibility (Niroula & Student, 2024). A study by Noviyanti et al. revealed that CBDCs can replace the use of physical currencies only depending on how people and businesses perceive the features, benefits (better allocation, accessibility, interest, convertibility, and reduced costs) and possible challenges (inverse of benefits) associated with CBDCs compared to physical currencies (Noviyanti et al., 2024).

## METHODOLOGY

This research uses a descriptive qualitative approach, where the author focuses on an in-depth understanding of the phenomena related to the application of CBDC and its potential impact on the profitability and stability of the commercial banking system in emerging markets. The type of research conducted is library research, where the author collects data from written sources, such as books, journals, reports, and other documents relevant to this research. This allowed the author to access pre-existing knowledge. This process involves literature search, text analysis, and information synthesis. After collecting data from literature sources, the researcher conducted an in-depth analysis. This involved reading, categorizing and interpreting information relevant to the research topic. The results of the analysis were used to describe the phenomenon under study. Then, to keep the data and information up to date, the author limited the literature search to literature published between 2016 and 2024.

## RESULT AND DISCUSSION

### CBDC Implementation in Emerging Markets

Central bank digital currencies (CBDCs) have been implemented in several developing countries, including Brazil, Russia, India, China and Nigeria. China has been a pioneer in the development of central bank digital currency (CBDC) by launching e-CNY or Digital Yuan, led by the People's Bank of China (PBOC). The e-CNY project aims to improve payment efficiency, reduce the dominance of private payment systems, and strengthen government oversight of financial transactions (Bank for International Settlements (BIS), 2022). The unique features of e-CNY, such as offline transaction capabilities and limited anonymity, make it an inclusive and efficient payment tool. However, challenges such as competition with private payment platforms and user privacy



concerns remain barriers to mass adoption (Jiang, 2023).

Recent developments in e-CNY show significant expansion, both at home and abroad. China is exploring the use of e-CNY in cross-border transactions through the m-CBDC Bridge project led by the Bank for International Settlements (BIS) (Pratomo, 2023). The move aims to increase the yuan's role in international trade and reduce dependence on the US dollar. Despite facing digital infrastructure challenges in rural areas, e-CNY has proven its potential as a transformative tool in China's financial system. The success of e-CNY is not only relevant for China but also serves as a model for other countries, especially developing countries, in facing the era of financial digitalization.

Apart from China, Nigeria has also implemented a central bank digital currency, eNaira. Nigeria became the first country in Africa to launch a central bank digital currency (CBDC) by introducing eNaira in October 2021 (IMF, 2021). The eNaira project is led by the Central Bank of Nigeria (CBN). As a country with a large population and a high level of cash usage (Sasu, 2024), eNaira is designed to provide wider financial access, especially for the unbanked. eNaira is also expected to facilitate the distribution of government social assistance and reduce budget leakages (Kedem, 2021). However, the adoption of eNaira faces challenges such as low digital literacy, limited technological infrastructure (F, 2024), and competition with already popular mobile money payment systems.

Despite the challenges, eNaira has shown significant potential. The Nigerian government is also using eNaira to distribute cash transfers directly to citizens, increasing transparency and efficiency. In addition, eNaira is expected to strengthen Nigeria's position as a leader of financial innovation in Africa. However, to achieve

mass adoption, further efforts are needed in improving digital infrastructure, public education, and public trust in the digital financial system.

Developing countries have strong motivation to implement central bank digital currencies (CBDCs), especially to improve financial inclusion and payment system efficiency. Many developing countries face challenges such as unbanked populations and reliance on cash, which hinders economic growth. CBDCs can provide access to the formal financial system for rural and remote communities through affordable digital payment solutions. In addition, CBDCs can also reduce transaction costs, especially for cross-border remittances, which are an important source of income for many developing countries. Other motivations include increasing transparency in social assistance distribution, reducing corruption, and strengthening monetary sovereignty amid competition with foreign digital currencies (Kedem, 2021). However, the implementation of CBDC in developing countries also faces significant challenges. Limited digital infrastructure and low financial literacy are the main barriers to CBDC adoption (Niroula & Student, 2024).

### **Potential Impact of CBDC on Commercial Bank Profitability**

The implementation of central bank digital currencies (CBDCs) in emerging economies has affected commercial banks' earnings, both in terms of interest income and non-interest income. The profound impact of CBDCs on commercial banks' deposits, loans and international operations, suggests that CBDCs may reduce commercial banks' deposit base. For example, in China, although e-CNY is still in the pilot stage, its impact on China's banking system is starting to show, especially in terms of changes in deposit patterns and financial transactions (Gao, 2024).

Another potential impact of CBDC is banking disintermediation (Beckmann et al., 2024), where

people may move some of their funds from traditional bank accounts to CBDCs. This could reduce bank deposits, which are a source of cheap funds for commercial banks. If deposits decrease, banks will find it difficult to maintain their net interest margin (NIM), which is the difference between interest on loans and interest on deposits. If the bank's interest income decreases, the bank's profitability will also decrease (Mulyani, 2019). In China, although the People's Bank of China (PBOC) has limited the amount of e-CNY that can be held by individuals to minimize the risk of disintermediation, these concerns remain. Data from e-CNY trials in cities such as Shenzhen and Suzhou show that some people are starting to use e-CNY for daily transactions (Feng, 2023), which can gradually reduce their bank account balance.

On the non-interest income side, CBDCs have the potential to reduce banks' income from transaction fees and payment services (Gao, 2024), as transactions are moved to the CBDC platform. However, commercial banks also have opportunities to develop new CBDC-based digital services. For example, several large banks such as the Industrial and Commercial Bank of China (ICBC) and Bank of China (BOC) have collaborated with PBOC to integrate e-CNY into their digital banking applications. This allows banks to offer innovative products and services, such as CBDC-based QR code payments or integration with e-commerce platforms.

While CBDCs have the potential to reduce commercial banks' interest income through disintermediation, they also open up new opportunities to increase non-interest income through digital innovation. With the right collaboration between central banks and commercial banks, CBDCs can be a transformative tool that supports financial efficiency and inclusion in emerging markets, while minimizing the negative impact on bank profitability.

On the other hand, the implementation of central bank digital currencies (CBDCs) has a significant impact on the operational costs and efficiency of commercial banks. On the one hand, CBDCs can help banks reduce operational costs related to cash management, such as transportation, storage, and physical security costs (C et al., 2024). For example, in Nigeria, the implementation of eNaira has reduced banks' reliance on cash (Adedipe, 2022), which traditionally required expensive infrastructure for distribution and management. Additionally, CBDCs can simplify the payment and fund transfer process, reduce transaction fees and increase transaction completion speed. This can improve the operational efficiency of banks, allowing them to allocate resources to more value-added services.

In addition, CBDC implementation also requires significant initial investment in digital technology and infrastructure. Banks need to integrate systems with CBDC platforms, which may require software updates, staff training, and cybersecurity upgrades. Although these initial costs are high, in the long run, CBDCs can improve bank efficiency through processing automation and reduced reliance on expensive traditional payment systems. For example, in China, commercial banks that integrate e-CNY into their systems have reported increased efficiency in digital payment services and liquidity management (Bank for International Settlements (BIS), 2022).

### Differences in Impact between Developing Countries

There are various factors that affect the variation in the impact of CBDCs in emerging markets, including the level of CBDC adoption, regulation and financial infrastructure. The following is a table explaining the different impacts of CBDC implementation on the profitability of commercial banks in the five BRICS countries,

adjusted to the economic context, financial infrastructure, and policies of each country.

**Table 1. Differences in the Impact of CBDC Implementation in BRICS Countries**

Country	Status CBDC	Impact Determinants	Impact on Commercial Bank Profitability
Brazil	Development plan (DREX, blockchain-based, target 2024)	<ul style="list-style-type: none"> <li>- The dominance of the successful Pix (instant payment) system.</li> <li>- High level of financial inclusion (85% of the population).</li> <li>- High concentration of banking.</li> </ul>	Neutral to Negative: Competition with the Pix system and CBDC may reduce transaction fees, but banks may gain new revenue from tokenized assets.
Russia	Digital Ruble trial (2023), Focus on domestic and cross-border transactions.	<ul style="list-style-type: none"> <li>- Western financial sanctions are accelerating the adoption of CBDCs.</li> <li>- Reliance on SWIFT is reduced.</li> <li>- Risk geopolitical.</li> </ul>	Neutral: Operational cost savings from digital transactions, but liquidity pressures may reduce net interest margins
India	Pilot Digital Rupee (e₹, 2022) for retail and wholesale.	<ul style="list-style-type: none"> <li>- UPI's infrastructure is successful (46% of global digital transactions).</li> <li>- National priority financial inclusion.</li> <li>- Large unbanked populations.</li> </ul>	Potential Positives: Operational efficiency is improving, but banks need to innovate to maintain deposits.
China	e-CNY (active trial in 26 cities, integration with Alipay/WeChat Pay).	<ul style="list-style-type: none"> <li>- The dominance of private digital payment systems.</li> <li>- Strict regulation for capital control.</li> <li>- Centralization of data.</li> </ul>	Moderate Negative: Disintermediation of small banks due to the migration of deposits to e-CNY, but large banks can benefit from integrated CBDC services.
South Africa	Khokha project (wholesale CBDC trial), focusing on system stability.	<ul style="list-style-type: none"> <li>- Low financial inclusion (only 69% of the population is banked).</li> <li>- Dependence on cash.</li> <li>- Risk of currency volatility.</li> </ul>	Short-Term Negatives: Adaptation costs are high for infrastructure, but increased inclusion can increase the long-term customer base.



In Brazil, the presence of the mature Pix instant payment system actually creates challenges for CBDCs. As an efficient and integrated digital infrastructure, Pix has dominated the retail transaction market. As a result, CBDCs have the potential to overlap with existing services, sparking competition that can reduce bank revenues from transaction fees. Brazilian banks may struggle to maintain profitability if CBDCs are not designed to complement, rather than replace, existing systems.

Instead, India is taking a collaborative approach by leveraging CBDCs to strengthen the Unified Payments Interface (UPI), the digital payments platform that is the backbone of the country's financial inclusion. Here, CBDCs serve as an additional layer that improves UPI efficiency, allowing banks to collaborate with digital infrastructure providers. This synergy not only expands financial access but also opens up new revenue opportunities for banks through technology-based services.

China prioritizes CBDCs (e-CNY) as a tool to strengthen government regulatory control over the financial system. By monitoring transactions in real-time, authorities can prevent money laundering and illegal speculation. However, this policy comes at the expense of the profitability of small banks that have lost the opportunity to optimize data-driven services. The dominance of large banks in the e-CNY ecosystem further widens the competitive inequality in the banking sector.

Meanwhile, Russia is developing CBDCs mainly to avoid global financial sanctions. The digital ruble is expected to facilitate cross-border transactions that are not exposed to the SWIFT system. However, liquidity pressures due to sanctions actually limit the ability of commercial banks to manage CBDC reserves. Instead of strengthening resilience, the risk of liquidity instability has the potential to disrupt domestic banking operations.

South Africa faces unique barriers to adopting CBDCs: uneven digital infrastructure and low levels of financial inclusion (only 85% of the population has access to basic banking services). In the short term, the implementation of CBDC risks increasing the operational burden of banks due to the need for massive investment in technology and public education. Banks' profitability may be eroded by these transition costs.

However, the long-term potential is significant. If CBDCs are successfully integrated with financial inclusion policies, banks can reach rural unbanked populations and create new markets. This growth will be driven by transaction efficiency and reduced dependence on cash, provided that the government and the private sector work together to build supporting infrastructure.

The difference in the impact of CBDCs in developing countries reflects the complexity of the market that cannot be standardized. In Brazil and India, the maturity of digital infrastructure is a determining factor whether CBDCs will become competitors or partners for banks. In China and Russia, political motivation trumps economic considerations, while in South Africa, infrastructure inequality must be overcome before the benefits of CBDCs can be felt.

The main lesson is that the success of CBDCs does not depend solely on technology, but on the ability to adapt to the local context. Adaptive regulation, collaboration between stakeholders, and infrastructure investment are key to minimizing risks while maximizing the potential of CBDCs for the stability of the banking sector in developing countries.

### **Implications for Banking System Stability**

The implementation of CBDCs also has the potential to have a long-term impact on stability and systemic risks. Table 2 explains the impact

Table 2. Implikasi CBDC terhadap Stabilitas Sistem Perbankan dan Risiko Sistemik

Country	Implications for Banking System Stability	Long-Term Impact & Systemic Risk
Brazil	<ul style="list-style-type: none"> <li>- Short-term stability: Potential decline in bank liquidity due to the migration of deposits to CBDCs.</li> <li>- The use of the Pix system reduces the risk of transaction shocks.</li> </ul>	<p>Risk: Market fragmentation if CBDC and Pix are not integrated.</p> <p>Opportunity: Stability increases if banks adopt asset tokenization for income diversification.</p>
Russia	<ul style="list-style-type: none"> <li>- Stability is depressed due to sanctions and potential capital outflows through CBDCs.</li> <li>- Domestic transactions are more efficient, reducing dependence on SWIFT.</li> </ul>	<p>Risk: The bank's liquidity is depleted if the Digital Ruble is used for capital control evasion.</p> <p>Opportunity: The system is more resistant to external shocks if CBDCs succeed in reducing dependence on the US dollar.</p>
India	<ul style="list-style-type: none"> <li>- Stability is increased with the integration of CBDC and UPI, reducing transaction costs.</li> <li>- Risk of disintermediation of small banks if deposits move to e₹.</li> </ul>	<p>Risk: The concentration of risk in a large bank if a small bank goes out of business.</p> <p>Opportunity: Financial inclusion expands the customer base, reducing systemic inequality.</p>
China	<ul style="list-style-type: none"> <li>- Stabilitas terkontrol karena regulasi ketat e-CNY, tetapi bank kecil terancam kehilangan deposito.</li> <li>- Pengawasan transaksi real-time meningkatkan deteksi risiko.</li> </ul>	<p>Risk: The monopoly of big banks and fintechs (Alipay) increases systemic dependence on a handful of actors.</p> <p>Opportunities: Anti-money laundering systems are more effective, reducing the risk of financial crime.</p>
South Africa	<ul style="list-style-type: none"> <li>- Stability is vulnerable because the cost of adapting CBDC infrastructure is burdensome for banks.</li> <li>- The potential for increased financial inclusion strengthens the bank's fund base.</li> </ul>	<p>Risk: The volatility of the Rand currency could be exacerbated by CBDC circulation.</p> <p>Opportunity: Long-term stability if CBDCs reduce reliance on cash and shadow banking.</p>

In Brazil and India, the migration of deposits to CBDCs could reduce bank liquidity, sparking interest rate competition to retain customers. However, a mature system (Pix/UPI) helps mitigate risk. In China and Russia, central banks can "freeze" CBDCs in crisis, increasing liquidity controls, but risk triggering public distrust if policies are deemed too interventionist.

Regarding technology and security risks, all BRICS countries experience a reliance on digital infrastructure that can increase exposure to the risk of *cyberattacks*, technical disruptions, or operational errors. This risk will be higher in South Africa and India due to uneven financial infrastructure. In terms of regulation and supervision, in China and Russia, the centralization of transaction data through CBDCs allows for stricter supervision, reduces the risk of money laundering, but has the potential to cause public resistance. Then in Brazil & South Africa, vague regulation of CBDCs could create legal uncertainty, hampering investment in the banking sector. Further in terms of resilience to crises, in India & China, the integration of CBDCs with digital payment systems (UPI/Alipay) increases the response capacity to liquidity crises. In Russia and South Africa, CBDCs can be a tool for sanctions evasion or exchange rate stabilization, but they risk exacerbating macroeconomic imbalances if not managed carefully.

The implementation of *Central Bank Digital Currency* (CBDC) in BRICS countries offers mixed impacts on banking system stability and systemic risks, depending on the economic context, digital infrastructure, and policies of each country. In Brazil and India, CBDCs have the potential to improve transaction efficiency through integration with Pix and UPI systems, but the risk of small bank disintermediation and market fragmentation remains threatening if deposit migration is not

controlled. Meanwhile, in China and Russia, CBDCs are a tool to strengthen regulatory control and avoid sanctions, although they risk triggering a concentration of liquidity in large banks or reliance on interventionist policies. South Africa faces infrastructure challenges and currency volatility that magnify short-term risks, although potential financial inclusion could be a catalyst for long-term stability. Systemically, although CBDCs increase resilience to crises through real-time oversight and reduced transaction costs, risks such as liquidity flight, cyberattacks, and technological dependency threaten the balance of the financial system. Therefore, the success of CBDCs in emerging markets depends on policies that balance innovation with risk mitigation such as restrictions on public ownership of CBDCs, central-private bank collaboration, and strengthening digital infrastructure to ensure inclusive and sustainable transformation without sacrificing banking stability.

## CONCLUSION AND RECOMMENDATION

The implementation of central bank digital currencies (CBDCs) in developing countries has an impact on commercial banks, covering revenue, operations, and business strategy. In terms of revenue, CBDC has the potential to reduce the deposit base through disintermediation. However, CBDC also opens non-interest income opportunities through digital service innovation. On the operational side, CBDCs reduce cash management costs. The main challenges remain on balancing the risk of disintermediation and declining interest income with the potential for digital transformation, central-commercial bank collaboration, and increased financial inclusion, making CBDCs a strategic tool for efficiency and innovation in developing countries. Central Bank Digital Currency (CBDC) can also have a variety of impacts on the stability of the banking system,

depending on the economic context and individual policies. In Brazil and India, CBDCs can improve transaction efficiency through the integration of systems such as Pix and UPI, but risk leading to the disintermediation of small banks and market fragmentation if deposit migration is not controlled. While in China and Russia, CBDCs are used to strengthen regulatory control and evade international sanctions, although they have the potential to concentrate liquidity in large banks or increase reliance on government intervention. South Africa faces digital infrastructure challenges and currency volatility that magnify short-term risks, although financial inclusion has the potential to be a driver of long-term stability. Systemically, although CBDCs improve crisis resilience through real-time surveillance and cost efficiency, risks such as cyber vulnerabilities and technology dependency can upset the financial balance. The success of CBDCs in these developing countries depends on policies that balance innovation with risk mitigation, such as restrictions on public

ownership of CBDCs, central-private bank collaboration, and strengthening digital infrastructure to ensure inclusive and sustainable transformation without compromising banking system stability.

There are some limitations in this study, namely the focus of the research is only on BRICS countries, so the findings may not fully represent the dynamics in other developing countries with different economic and infrastructure conditions. The study also does not integrate macroeconomic factors (such as inflation, GDP growth) or political policies that may affect the relationship between CBDCs and bank profitability. Suggestions for further research are to expand the study to non-BRICS developing countries (e.g. in Southeast Asia or Latin America) to understand the variation in CBDC impacts based on local context and analyze the interaction between CBDCs and macroeconomic variables, monetary policy, or political stability.

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