

ANALYSIS OF THE IMPACT OF DIGITAL RUPIAH ON BANKING SYSTEM STABILITY AND MONETARY POLICY EFFECTIVENESS

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ABSTRACT

The Digital Rupiah (CBDC) that can potentially be the answer to Indonesia's financial digitalization struck both opportunities and threats in the national currency ecosystem. Using qualitative methodology, this study investigates regulatory documents, pilot program reports and scholarly articles to ascertain its impact on bank resilience and the efficiency of policy transmission. It is evident that the broad adoption of CBDCs would result in funds shifting out of commercial banks to central bank wallets as liquidity margins are diminished and borrowing costs correspondingly rise. Transparent oversight of transactions gives monetary authorities greater tools to regulate both price levels and credit allocations. The ultimate impact of this instrument, though, depends on whether it's incentivized with yield that can compete with traditional savings products. This paper presents a governance-oriented framework to motivate well-managed cooperation between monetary authorities and commercial lenders to maintain financial stability in the presence of liquidity shortages.

Keywords: *Digital Rupiah, Financial System Stability, Central Bank Digital Currency (CBDC), Monetary Policy*

INTRODUCTION

As cash use declines, the pace of payment technology innovation quickens and monetary sovereignty is increasingly challenged by crypto assets and stablecoins, digital transformation of the global financial system lures central banks in numerous countries to develop Central Bank Digital Currency CBDC. Finally, Central Bank Digital Currency is considered a powerful policy tool to improve the efficiency of payment systems, promoting financial inclusion and transmitting monetary policy in digital economy (Barrdear & Kumhof, 2022; Auer et al., 2022). As part of the National Financial System Architecture Transformation and strengthening of central bank's role in digital economy, Bank Indonesia has started Digital Rupiah

Development through Project Garuda (Bank Indonesia, 2022) CBDC suggests that it comes with its share of serious implications for the stability of the banking system along with opportunities. LBM has a potential for banking disintermediation, as it directs public access fully to central bank digital money; this results in the transfer of deposits from commercial banks to the central bank's balance sheet. These conditions can lead to liquidity stress on banks, restrict their ability to distribute credit as the risk of financial turmoil rises (Rachmad, 2025). Empirical studies in the ASEAN region also show that public expectations and the intensity of news coverage related to CBDC can significantly influence risk perception and banking stability (Hidayat et al., 2026).

Central Bank Digital Currency monetary policy is considered to have great potential to improve the effectiveness of policy transmission through interest rate, liquidity, and economic actor expectation channels. Macroeconomic models show that an interest-bearing Central Bank Digital Currency can strengthen the influence of monetary policy on inflation and output, as well as reduce transmission friction that has previously relied on banking intermediaries (Dyson & Hodgson, 2016; Bordo & Levin, 2017). Studies based on DSGE also find that the existence of Central Bank Digital Currency can improve macroeconomic stability and monetary policy effectiveness in both closed and open economies, although the impact heavily depends on the design and implementation framework of the Central Bank Digital Currency itself.

Nevertheless, the relationship between the effectiveness of monetary policy and the stability of the banking system in the context of Central Bank Digital Currency remains ambiguous and has not reached an academic consensus. . Some observation shows that the introduction of Central Bank Digital Currency will enhance overall financial stability, but other studies reveal the possibility of a conflict between the objectives of maintaining price stability and financial stability due to the occurrence of a digital bank run triggered by increased demand for Central Bank Digital Currency (Schilling et al., 2024; Tercero-Lucas, 2023). This issue highlights the necessity of a more profound and contextual study, particularly for developing countries such as Indonesia, with a significant banking system in their monetary policy transmission mechanism.

From the above description, the purpose of this study is to examine the effects of the implementation of Digital Rupiah on banking stability and monetary policy effectiveness in Indonesia, according to theories and evidence found in international literature on Central Bank Digital Currency. It is hoped that this study can contribute to the development of Central Bank Digital Currency literature and at the same time provide an academic resource to policymakers regarding the formulation of a Digital Rupiah that is innovative, stable, and effective in monetary policy

LITERATURE REVIEW

In the paper entitled Monetary Policy Strategy in the Presence of Central Bank Digital Currency, Syarifuddin and Bakhtiar (2021) examine the impacts and monetary policy strategies that emerge following the emergence of the Central Bank Digital Currency (CBDC). One strength of the study is its adeptness in mathematically constructing the workings of the interest-bearing CBDC, which has proven effective in bolstering the efficiency of the interest-rate channel, thereby increasing the effectiveness of inflation control. The study provides an important theoretical foundation for formulating the optimal Digital Rupiah. Nevertheless, a weakness of the paper is its rigid framework for the DSGE model, which is highly dependent on certain parameter values, thus failing to accommodate unforeseen behavior of the agents or non-linear exogenous shocks during actual crisis scenarios.

This is addressed to a lesser extent in Rachmad (2025), who studied the broader scope of CBDCs, specifically their

security and inclusivity aspects in his recent review (The Effects of CBDCs on Monetary Policy and Financial Stability). However, the contribution of this paper is in the wide-ranging approach that it takes when connecting monetary sovereignty and the stability of cybersecurity infrastructure, thus creating a strategic framework for central banks in dealing with the digital transition. This is crucial for stability and inclusivity in the financial sector. In contrast, the present study has some limitations related to operational problems, particularly in estimating what it would cost to implement a CBDC and how to incentivize commercial banks to invest in digitalization.

As explained by the International Monetary Fund (IMF) (2023) in a paper titled "Central Bank Digital Currency and Bank Disintermediation in a Portfolio Choice Model," the Portfolio Choice Model determines how individuals allocate their wealth between bank deposits and CBDCs. The most significant advantage of the research is the practical application of its findings in highlighting the possible dangers arising from lower liquidity due to the transition of money into highly secure digital currencies. In that case, this research serves as an important warning while designing the Digital Rupiah, especially concerning setting the ceiling on deposits. However, the model tends to simplify worldwide dynamics and, therefore, fails to consider the specifics of developing countries, such as the degree of financial literacy and preference for conventional banking.

According to Adalid et al. (2022), the various situations of CBDC demand and their impacts on the intermediation capabilities of banks are studied in the report published by the European Central Bank under the title of Central Bank Digital Currency and Bank Intermediation. This study stands out due to its extensive investigation on the possible competitive behaviors of commercial banks such as offering higher interest rates on deposits to reduce fund transfers. This study may be used as a reliable reference for risk management in the Indonesian banking industry. However, one main weakness of the study is that it covers only the Eurozone, where the financial system is more sophisticated compared to Indonesia.

The Contribution of Hidayat et al. (2026) in their research "The Impact of News Sentiment on the Stability of the Banking System due to Digital Currency of Central Bank in ASEAN-5 Countries" is their addition to the existing body of literature with their empirical findings regarding how news sentiment related to CBDCs can influence the stability of the banking system of ASEAN-5 countries. The key contribution of this research comes down to the significance of market psychology and policy-making in general, showing that providing information is very important for reducing the risk involved in transitioning to a new financial era – the digital one. The significance of this paper can be seen in the targeted regional approach. Its limitation, however, lies in the rather short-term observation since CBDC is being introduced into ASEAN's economies as an experiment at present.

METHODOLOGY

The methodology used in this study is descriptive qualitative which includes a literature review of academic journals, reports from Bank Indonesia, and technical papers published by global finance organizations (IMF & BIS). The data were extracted from academic databases such as Google Scholar, publications indexed in Scopus and official websites of related organizations. Key criteria for selecting literature are: (1) relevance to digital currency and the elimination of banks as intermediaries, (2) publication in the last decade to provide contemporary relevance, and (3) reliability of sources with peer-reviewed articles and official policy documents being preferred. Works that lacked empirical significance or theoretical relevance were excluded. The analysis was conducted in three stages. The literature was first scanned and grouped by themes (bank stability, liquidity channel, the transmission of monetary policy.) Then, a metric was established to compare more traditional banking structure and ones based on digital currency; A thematic synthesis approach was then employed to identify trends related to changes in liquidity, disintermediation risks and the effectiveness of monetary policy. Data was examined using a deductive analysis and helped identify theoretical models to apply to the empirical findings, offering an exhaustive overview of the probably perils and opportunities regarding monetary sovereignty in this new era of digitalization.

DISCUSSION

The Effectiveness of Monetary Policy Transmission in the Digital Era

This foundation has been radically altered by the emergence of tech-based financial services. Technically, financial digitalization that also includes the introduction of electronic money (e-money) resonates with the role of an addition to or a replacement form for traditional banking system. According to a recent IMF report (Huang et al., 2024), electronic money catalyzes financial inclusion in several developing countries and, thus, strengthens monetary policy transmission. By bringing people who otherwise would not have access to banking into the existing financial system electronic money increases deposits in commercial banks via trust funds, increasing banks' ability to provide loans, and increasing how responsive interest rates are to central bank policies.

Issues arise when electronic assets act as substitutes in a way that siphons deposits away from the banking sector. This phenomenon can be seen in the dynamics between cryptocurrencies and stablecoins, which form a parallel financial system. It is well, in fact, known already that the very "crypto factor" affecting traditional transmission channels of financial stabilization mechanisms (Bello, 2024) appears to be reshuffling balance sheets through risk-taking channels of subsequent economic frustrations. Policy interest rates and other standard tools can still be used, but their effects are now complicated by digital asset volatility, one that often reveals a tight correlation with stock markets. This calls for monetary authorities to take a more aggressive stance on the potential outlets of financial disintermediation which can sap the central bank's control over market liquidity.

The transmission efficacy also varies markedly within ASEAN-5 countries, depending on the type of channels utilized. According to Firmansyah and Mu'ammal (2024), banks' intermediary efficiency has improved with digitalization within banking operations, as seen from asset price-response and credit distribution-response to policy signals. Particularly in the context of Indonesia, empirical results show that exchange rate channel tends to have a deeper long-term effects than interest rate (Elisa et al., 2023). This highlights that the payment system's digitalization ought to be able to support Rupiah external stability in the context of digital capital flows which are increasingly rapid. The issuance of facilities like BI 7-Day Reverse Repo Rate does not mean fast transmission, and this is highly dependent on how the next three x interbank money market reacts to digital signals received from the monetary authority (Astuti & Hastuti, 2020). Given that the exchange rate channel is characterized by high sensitivity in Indonesia (Elisa et.al 2023), the Digital Rupiah would play an essential role on maintaining monetary sovereignty towards fearing foreign stablecoin that harm stability of the exchange rate.

According to the Garuda Project, the Digital Rupiah is a vital project to reduce monetary disintegration in Indonesia. The Digital Rupiah is more than just a payment method; it is also an effort to enhance the independence of monetary through 2 main models: Wholesale CBDC for interbank money market efficiency, and Retail CBDC with direct access to the public. These models allow the central bank to apply monetary policy more directly to the real economy, especially during emergencies when traditional banking systems experience a shortage of credit. On the other hand, to ensure banking stability, this implementation must be carefully crafted, particularly in terms of interest rates, to avoid a situation where a large number of customers swiftly transfer their funds from traditional banks to the Digital Rupiah. Thus, the success of the Digital Rupiah will largely depend on how well it can provide rapid monetary transmission while Bank Indonesia manages liquidity issues that could affect the stability of the national banking sector.

Implications for Banking System Stability and Disintermediation Threats

The consequences of innovations in digital finance, growing importance of non-bank financial institutions, and possible CBDC issues are related mainly to shifts in banks' capitalization, risk positions, and credit intermediation disintermediation. Research on CBDC suggests that having an interest-bearing CBDC decreases the value of a bank under the normal situation as a result of the movement of part of public resources from deposits to central bank assets and reducing the bank's ability to distribute credit (Bitter, 2024). However, in crisis conditions, CBDCs can actually lower the risk of a bank run because the public has alternative safe liquid instruments on the central bank's balance sheet, especially if the issuance is accompanied by central bank asset purchases that delay bank failures due to liquidity or insolvency (Bitter, 2024).

Other studies emphasize that without proper restriction designs, the substitution of funds from deposits to CBDCs could trigger disintermediation risks and systemic credit tightening; thus, an adaptation of a two-tier money model is

required through CBDC holding limits and the regulation of disintermediation speed to ensure the monetary ecosystem remains consistent and stable (Resano, 2024). On the other hand, disintermediation processes also arise from the expansion of non-bank financial intermediation and fintech lending, which shift part of the financing function from banks to other platforms and institutions. Globally, the assets of non-bank financial institutions have approached half of the world's financial assets and introduce new systemic risks through leverage, liquidity, and close ties with the banking sector for instance, through multi-layered securitization and balance sheet interconnectedness that can accelerate shock transmission (Kuznetsova & Larina, 2024; Aramonte et al., 2021). Therefore, strengthening macroprudential frameworks, limiting excessive linkages with banks, improving risk measurement quality, and regulating secondary-tertiary securitization are seen as crucial to preventing stability disruptions (Kuznetsova & Larina, 2024; Aramonte et al., 2021).

Meanwhile, empirical evidence from Indonesia shows that the expansion of fintech lending does not automatically disrupt stability; rather, it encourages banks to improve efficiency and credit quality while diversifying risk, such that bank-fintech synergy has the potential to support systemic resilience if well-regulated (Junarsin et al., 2023). Overall, the risk of disintermediation to banking stability is ambivalent: on one hand, it can weaken the funding base and traditional intermediation role of banks, but on the other hand, it can expand financial access, increase efficiency, and deepen financial markets. The end result is determined by existing regulations (e.g., CBDC liquidity ownership, collateral for the non-bank sector), the strength of the supervisory framework, and banks' ability to adapt by improving risk governance, operational efficiency, and collaboration with digital financial service providers (Bitter, 2024; Kuznetsova & Larina, 2024; Junarsin et al., 2023; Resano, 2024).

Enhancing Financial Inclusion Through the Digitalization of the Rupiah Currency

The concept of accelerating financial inclusion through the digitalization of the Rupiah currency is one of the efforts for national economic development, which aims to create a divide between individuals with bank accounts and those without bank accounts, as well as those who are underserved by banks.. As a result, the introduction of the Digital Rupiah can be viewed not only as a process of switching from physical currency to digital cash but also as issuing currency which will be far more inclusive compared to its traditional counterpart. Thanks to the implementation of modern technologies, including DLT, or even with the help of centralization, Digital Rupiah will be capable of conducting transactions without being affected by geographical constraints and without causing any expenses to the users; thus, it will be extremely beneficial for underdeveloped, peripheral areas.

Moreover, the proposed process can be regarded as a driver for economic empowerment since it will provide the opportunity to create reliable and legitimate data footprints. Many MSMEs have been suffering from the problem of obtaining financing because of the lack of their financial transactions' traceability. Using the Digital Rupiah makes all cash flows recorded in the ecosystem of the digital world, which then may function as evidence of repaying ability or an alternative way of credit scoring by financial institutions. It would certainly reduce the risk factor for the small business players, making it possible for them to move out of the informal loan system into a more effective and sustainable formal financing method.

As for welfare distribution, digitalization of the Rupiah provides a very efficient system to distribute social assistance by the government to their citizens. Utilizing programmable or what is called 'smart money', social benefits from the government can be directly transferred to the digital wallets of the beneficiary without any middleman involved. Hence, it eliminates the possibilities of budget leakages, distribution cost, and delays. The beneficiaries could then spend their money directly on basic necessities in an interconnected digital system. In other words, it helps to accelerate the circulation of money from the bottom up. Therefore, the digital Rupiah functions as a link between local economic opportunities and the national market with equal economic development and growth, as well as enhancing the economic resilience of people against external shocks.

Regulatory Challenges, Cybersecurity, and Personal Data Protection

Within regulation, numerous nations have actually enacted legislation concerning data protection and cybersecurity including GDPR in the EU, CCPA/CPRA in America, China's Cybersecurity Legislation, as well as numerous various other sectoral guidelines that seek to enhance conformity and safeguard delicate information versus cyber dangers (Okoro, 2025; Trikha et al., 2024; Irfan et al., 2025; Wang et al., 2024). Nonetheless, variations in regulations, cross-jurisdiction cybercrime, as well as variances in law enforcement bring about legal disorganization

that makes it complicated to comprehend which policies are relevant, specifically for cross-nation cross-sectoral electronic companies (Okoro, 2025; Satory et al., 2024; Qudus, 2025; Noor, 2025). Moreover, legislations normally fail to maintain pace with developments in innovations, leading to policy space for innovative modern technologies such as synthetic intelligence, IoTs, cloud computing, as well as blockchain which manage big information in unforeseen methods (Fayayola et al., 2024; Satory et al., 2024; Wylde et al., 2022)

On the cybersecurity front, the expanding complexity in dangers including malware, ransomware, social design attacks, and assault on crucial infrastructure require that organizations consistently upgrade their safety positions (Fayayola et al., 2024; Parkash, 2025; Zhou, 2025). Cross-sectoral research studies indicate a boosting fad in data leakages where information leakage originates from hacking as well as IT-related threats targeting sensitive details such as private identity, monetary, and health information (Parkash, 2025; Adegbite, 2025; Irfan et al., 2025). In spite of the boosting uptake of safety and security modern technology such as encryption, multi-factor authentication, access control systems (RBAC/ABAC), constant monitoring, and also zero trust structure, application of these solutions is restricted by budget plan restraints, absence of employee instruction, as well as reduced security management degree particularly in little and also tool business (Fayayola et al., 2024; Irfan et al., 2025; Parkash, 2025; Balogun, 2025). Administration of risks from third parties such as cloud vendors as well as financial modern technologies is a significant challenge due to the fact that most of the time leakages happen outside the organization, while responsibility falls upon the data controller (Wang et al., 2024; Adegbite, 2025).

For personal data security, the key obstacle includes actual application of concepts such as transparency, minimal data, objective restriction, as well as personal data rights (consent, access, modification, and also deletion of data) (Trikhya et al., 2024; Fayayola et al., 2024; Amoo et al., 2024; Wylde et al., 2022). Various scholarly works reveal that despite the fact that detailed policies such as the GDPR and alike frameworks increase personal data security criteria, execution as well as substantive compliance remains inconsistent particularly when it comes to right to be forgotten, consent-based control, as well as treatment of sensitive information in the economic and medical market (Trikhya et al., 2024; Amoo et al., 2024; Adegbite, 2025; Balogun, 2025). Within the workplace, there are additional dangers in terms of internal gain access to dangers, the rise of cellular and cloud devices, and monitoring of digital activity which may blur the line between personal and also company rate of interests (Novikov, 2025; Balogun, 2025). Conversely, organizations are called for to include safety throughout all stages of development (privacy-by-design and security-by-design) and also embrace technologies that safeguard personal information, consisting of advanced encryption techniques, difference personal privacy, federated discovering, as well as data anonymity (Fayayola et al., 2024; Akash et al., 2025; Irfan et al., 2025). Finally, problems in regards to regulation, cybersecurity, and also individual data defense are related to each other: lawful obedience needs solid safety and security and also administrative controls while too much style safety and security may lead to ethical as well as legal concerns if privacy is overlooked. As a result, there is a need for an incorporated technique towards harmonizing policies, enhancing safety management, raising technical capacity, as well as creating privacy awareness.

CONCLUSION AND RECOMMENDATION

This study provides a comprehensive analysis of the monetary policy transmission mechanism in the context of the ongoing transition to digital currency in Indonesia, with particular attention to the issue of the Digital Rupiah and its application to exchange rate management, banking stability, financial inclusion, and regulatory control. The manuscript is notable for its holistic approach that goes far beyond macroeconomics to consider institutional and technical aspects as well, although the theoretical framework may benefit from further clarification, the unnecessary overlap of the concluding and recommendation sections should be reduced, and a few normative statements might be strengthened with the use of empirical data or examples. The list of recommendations would also gain in persuasiveness if it was sorted in the descending order of their feasibility. Overall, the manuscript is a valuable addition to the literature on CBDCs in developing countries and is worth acceptance with minor changes.

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