

Central Bank Digital Currency and a Digital Rupiah Framework for Indonesia's Implementation: A Literature Review

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ABSTRACT: Bank Indonesia's white paper on the digital rupiah projects Indonesia's consideration of adopting a central bank digital currency (CBDC), following the likes of The Bahamas and Nigeria through the full implementation of their own CBDC systems and a major economy such as China launching their pilot CBDC. This study aims to create a framework to align with determinants of digital rupiah implementation that is relevant for Indonesia's current payment ecosystem. Through a comprehensive literature review which considers factors of global CBDC adoption along with existing studies of similar digital payment systems in Indonesia, the framework identifies financial inclusion, cybersecurity, technological infrastructure, regulatory quality, and system coexistence as factors to be observed towards the digital rupiah's advancement in their research stages. This study thus provides Bank Indonesia with considerations on how to approach their CBDC design within an Indonesia context and provides opportunities for further research on CBDC in general.

KEYWORDS - Central Bank Digital Currency (CBDC), Bank Indonesia, Framework, Literature Review, Digital Payment Systems

I. INTRODUCTION

The financial ecosystem of Indonesia is no stranger to the use of digital payment methods as the country increases their technology usage. Several payment systems have become a household name In Indonesia's online payment ecosystem with names such as GoPay, OVO, Dana, and ShopeePay. Bank Indonesia themselves have innovated the financial ecosystem with their recent introduction of QRIS in 2022, with many merchants registering their own QR codes and have integrated those codes with the previously mentioned payment systems (Bank Indonesia, 2020). Additionally, cryptocurrency emerged as another form of digital currency, albeit a decentralised one, that has taken the interest of many Indonesians especially within the younger generations (Fadli et al., 2025). As with many other central banks around the world, the speculative measure and monetarily volatile nature of cryptocurrencies have prompted Bank Indonesia to attempt to reduce the growing reliance of cryptocurrencies as a digital currency (Febriyanto et al., 2025).

With the growing interest in the research of central bank digital currency (CBDC) from central banks of many of the world's major economies, anticipating a future where Indonesia uses a digitalised and centralised version of the rupiah will not be too far off. Defined as a new form of money serving as a central bank obligation and has the same denomination as the official currency and can be used as a means of exchange, unit of account, or store of value, Bank Indonesia's white paper on their CBDC, dubbed as the digital rupiah, outlines how Indonesia's CBDC will play a part in reshaping the financial landscape of the country's currency transactions (Bank Indonesia, 2022). Across the world, central banks of countries that represent almost 98% of the World's GDP are exploring the potential of CBDCs as a means to modernise financial systems, enhance payment efficiency, and bolster financial inclusion (The Atlantic Council, 2023). As a rapidly developing nation with a robust and diverse economy, Indonesia has a significant stake in shaping its monetary future through the adoption of CBDC. The country's economic growth, digital infrastructure, and financial services sector have created an environment to be potentially conducive to CBDC adoption.

Within Indonesia, this shift towards CBDC adoption is influenced by both global trends and local imperatives. For Bank Indonesia, factors that contributes to a digital disruption on banking practices, such as an increased use of blockchain assets, the preferred use of financial transactions due to the COVID-19 pandemic outbreak, as well as other major economies taking considerable action on CBDC research, have made Bank Indonesia take their first steps in CBDC research. The release of Bank Indonesia's white paper on the digital rupiah provides information and outlines the central bank's vision and strategy for CBDC adoption in Indonesia, including research conducted to support the information provided. The white paper outlines the key features, objectives, and potential benefits of Digital Rupiah, shedding light on the central bank's approach to the digital currency (Bank Indonesia, 2022).

This study aims to determine which factors are relevant for Indonesia's eventual adoption of their own CBDC system by analysing previous studies conducted on central banks which have either launched their own

CBDC systems or conducted pilot launches, filling the gap of previous studies which focus on cross-country factors rather than country-specific factors. Once an analysis has been conducted the mentioned central banks, the current Indonesian currency and payment environment will be analysed to determine the benefits and drawbacks faced by each method, such as the current situation relating to cryptocurrencies and existing digital payment systems. A framework will thus be created to identify the determinants of proceeding to the next stage of Project Garuda's CBDC research of launching a pilot project and will thus contribute to Bank Indonesia's considerations of applying what works in other central banks' CBDC system or pilot projects towards Indonesia's payment environment.

II. LITERATURE REVIEW

The emergence of CBDC represents a response to the rapid digital transformation of the financial payment ecosystem. To highlight the growing trend towards CBDC adoption, several studies on central banks which have launched their CBDC systems have been analysed in varying degrees. Amongst the central banks in their varying stages of CBDC research, The Bahamas' and Nigeria's central banks have officially launched their CBDC systems, referred to as the Sand Dollar and the eNaira respectively, amongst others whereas the central banks of China and the European Union have started pilot projects for observation to name a few (CBDCTracker, 2025). CBDCs are categorised into two types, which are wholesale and retail CBDC. Wholesale CBDC is typically reserved for financial institutions and interbank settlements and typically preferred in economies with more developed financial markets and greater cross-border transactions, whereas retail CBDC is aimed at the public for everyday transactions and preferred in economies with lower levels of financial inclusion, large informal economies, and a higher degree of innovation (Maryaningsih *et al.*, 2022). The coexistence of both forms of CBDC is essential and a country is considered to have implemented an economic-wide CBDC adoption should both forms be adopted.

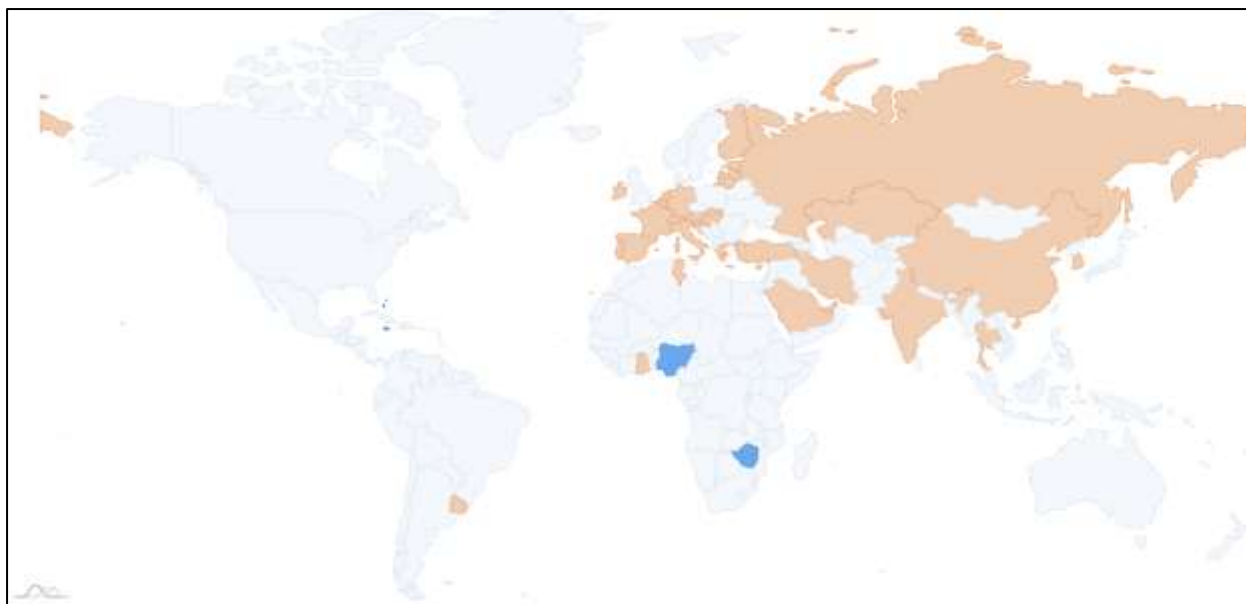


Figure 1. Stages of CBDC research in the pilot stage (in blue) and launching stage (in orange) as per May 2025. (CBDCTracker, 2025)

II.I International Perspective

In the case of The Bahamas, a country with a smaller population and GDP than Indonesia but geographically similar due to it being an archipelago, the Sand Dollar serves as an incentive to combat the financial inclusion gap within the country, which it has indeed slowly achieved. Several studies show however that after the launching of the sand dollar, implementation has seen a slow start due to the Central Bank of The Bahamas focusing more on expanding the system by inviting new financial groups to join the system rather than encouraging its use (Bilgen & Colberg, 2024), with studies showing cryptocurrencies gaining more of a favourability due to their anonymity and unregulated nature being more aligned towards The Bahamas' economic environment of being a tax haven, with CBDC thus serving as a payment system which promotes geopolitical purposes or to adhere to international standards instead (Wenker, 2022).

Nigeria is a country with a population and GDP closer to Indonesia's which may more accurately portray Indonesia's current economic situation. However, similar to the case in The Bahamas, several studies show after the implementation of the eNaira, although a positive impact is shown on financial inclusion due to the adoption

of the CBDC system, Nigerians are reluctant in the adoption of the eNaira due to factors concerning usage privacy, digital literacy on the knowledge of how to use the new system, and the lack of technological infrastructure in aiding a simplified use of the system (Akpan & Umaru, 2024; Omotubora, 2024). Many Nigerians feel that factors which help increase the positive intention to adopt CBDCs include performance expectancy, effort expectancy, social influence, trust, government regulation, and behavioural intention (Marzuk & Abdullah, 2024). As with many developing countries, research show that one of Nigeria's main determinants of CBDC adoption include financial inclusion in order to address the issue of the underbanked in the country, whilst perceived financial cost serves as an obstacle to individuals' behaviour to adoption, thus linking it to digital literacy once more (Osakwe et al., 2025).

II.II Indonesian Perspective

As a major economy in Southeast Asia as well as being part of the G20, Indonesia's unique socio-economic landscape creates a pressing need for innovative financial solutions. Mentioning groups that are poor or elderly, Fabris (2019) states that CBDC could play a pivotal role in advancing digital transactions by closing the financial inclusion gap for people who do not have ease of access to banking, thus extending this matter to Indonesia where CBDC can extend financial services to remote and underserved areas. However, it should be worth noting that although the aim for financial inclusion is more economic than monetary, the adoption of CBDCs should also be aligned with existing or potential regulations in order to ensure that the digital turnover is compliant with the relevant regulations, which is discussed by Mooij (2022) in the context of the European Central Bank's potential implementation of the digital euro with regards to the ECB's economic mandate. This view aligns with Project Garuda's objective of ensuring the population's financially vulnerable individuals are protected through CBDCs, with several studies concluding that CBDC reduces the share of unbanked individuals and thus promotes financial inclusion due to changes in lending schemes from lower liquidity risks and efficient payment systems (Tan, 2024) with significant impact amongst the sample's vulnerable individuals (Dunbar & Treku, 2024).

Bank Indonesia's (2022) outlines the key pillars of regulatory oversight and cybersecurity infrastructure necessary for secure CBDC deployment, emphasising the role of the central bank in regulating the currency. As with any efforts for digitalisation, the threats of cyberattacks are imminent due to the unique characteristics of CBDCs, with proposed mitigation techniques focusing on integrity, availability, and confidentiality risks. Prior to CBDCs, Indonesia's regulatory framework on cybersecurity for money laundering activities was seen as far from capable of protecting against such threats, albeit through a decentralised system of cryptocurrencies (Putri et al., 2023), with Santoso et al. 2023 going as far to conclude within their paper that current applicable regulations for cybersecurity only allows retail CBDC to operate as a payment instrument rather than a currency, which many Indonesians are already familiar with. Firdaus (2023) compares Indonesia's regulatory framework on cybersecurity compared to other countries currently undergoing CBDC research, namely Malaysia and Australia, and concludes that Indonesia is lacking in its existing money laundering laws, referred to as the Prevention and Eradication of Money Laundering Crimes (PPTPPU) Law in Indonesia, and would need to be reformed for harmonisation purposes with the implementation of CBDC. In cooperation with the Financial Services Authority (OJK), Bank Indonesia is ensuring that their practices and management are aligned with the Anti-Money Laundering and Countering the Financing of Terrorism (APUPPT), which is being monitored by the Financial Action Task Force (FATF) responsible for other central banks attempting to implement a CBDC. A study conducted by the IMF analyses several cybersecurity conditions that should be taken into consideration based on the CBDC research phase of each countries' central banks, with Bank Indonesia's proof-of-concept stage CBDC research being advised to consider prioritising trust by assessing risk mitigation strategies for all stakeholders and to start formulating a governance framework to ensure the security components of the potential CBDC to be aligned with existing payment systems and updated technological functions (Bharath et al., 2024). Digital literacy serves as a potential to mitigate these arising cyber threats as although the system is relatively new for many Indonesians, similar forms of financial technology has been introduced in the country and is now being utilised by most of the population, thus serving as a precedent CBDC adoption (Putri et al. 2023). Additionally, e-governance measures are studied to assist in technological advances by ensuring mutual trust between the government and their citizens, which includes CBDC as well (Grigalashvili, 2022; Malodia et al., 2021). Indonesian government agencies have already implemented measures and standards to ensure smoother e-governance as top-level support would be beneficial in preparing the population for CBDC adoption (Durigan Junior et al., 2022).

Assessing Indonesia's technological infrastructure to determine its readiness for CBDC adoption is critical. Indonesia's readiness for the adoption of both types of CBDC adoption must consider the existing digital infrastructure and the extent to which the population is equipped to engage with digital currency systems, as is the case with other countries whose CBDC projects are in the pilot and launched stages. As the topic is relatively new for many Indonesians, CBDC faces the challenge of needing to be understood by the population

to ensure proper digital literacy and awareness of the to-be introduced system with even more new functions such as offline functionality (Chu et al. 2022). As such, research conducted by Maryaningsih *et al.* (2022) categorises infrastructure in the form of access to electricity, quality of electric output, mobile subscription, and internet users, a majority of which is contributed by the younger generations within the Generation Y and Generation Z groups (Fadli et al., 2025).

Prior to CBDCs, the rising use and impact of cryptocurrencies have prepared policymakers in determining the best approach when dealing with digital currencies. Cryptocurrencies have been observed to have a negative impact on financial system stability due to their price differences and volatility as a result of their independence from monetary policy (Liu & Serletis, 2019). Bank Indonesia's white paper further emphasises the cryptocurrency problem and realises the need for effective monetary policy to use CBDC adoption to combat financial system instability from the use of alternative and unauthorised digital currencies. Thus arises the need to evaluate the economy's current regulatory framework from the top level, namely monetary, fiscal, and legal policies. Using China as an example, the People's Bank of China is shown to undergo towards a more proactive approach in the implementation of the digital yuan through the introduction of several drafts that cater towards a digitalised currency and ensuring a secure circulation of the currency whilst also mitigating potential cross-border crimes due to the ease of access of the system (Xu and Jin, 2022). Aginta & Someya (2022) mentions the importance of monetary policy on a per province basis and emphasizes the importance of interest rate, bank lending, and exchange rate channels. Similarly, the importance of fiscal policy is mentioned by Lewis & Oosterman (2010) as a driver for economic growth, and thus innovation for new systems such as CBDC, as sub-national support is not enough compared to central government support. Ramadhani et al. (2025) further reiterates this point with the consideration of implementing Automatic Exchange of Information (AEOI) procedures for the digital rupiah in order to harmonise the ongoing changes in the Indonesian tax law environment.

CBDC adoption in Indonesia must recognize the necessity of coexistence with traditional financial services. Launched in 2019, Bank Indonesia's has released a real-time payment system called the Quick Response Code Indonesia Standard (QRIS) which has revolutionised the payment ecosystem in the country (Bank Indonesia, 2020). This payment system has quickly been adopted by many transaction methods in the country, with users emphasizing its ease of use and usefulness as a major reason to adopt it (Nurqamarani et al., 2024) and drivers such as hedonic motivation increasing its popularity due to the development of technology in the country (Ramayanti et al., 2025). Similar to CBDCs, QRIS serves as an option for integrated payment systems in cross-border transactions, with Sonjaya et al. (2025) demonstrating the positive impact it has on countries in the Association of Southeast Asian Nations (ASEAN). Therefore, due to its similarity of being a payment system resulting from Bank Indonesia's innovation, the limitations in the adoption of QRIS can serve as a precedent of what to be aware of in CBDC implementation, namely limitations relating to infrastructure, digital literacy, and preference for traditional cash (Usman et al., 2025). As Indonesia is home to one of the fastest growing fintech industries, Zams *et al.* (2020) observes that a "cash-like" retail CBDC model is a suitable match for Indonesia as it not only has characteristics of a traditional currency but is most similar to financial services that a majority of Indonesians are familiar with, including both card and digital methods of transaction. Indonesia must thus find a way to incorporate CBDC and conventional banking services to promote interoperability and a well-structured ecosystem. Using the EU's digital euro as an example, Mooij (2021) states that due to the complex legal framework of the European Union Central Bank, a specified of the digital euro must be implemented towards the legal framework instead of vice versa, meaning the digital euro should be tailored to be aligned with the ECB's current regulatory framework. This is due to the ECB's mandates of promoting competitiveness with commercial banks for resource efficiency purposes, thus increasing the possibility of the digital euro becoming more of an alternative payment method, although the definition of legal tender according to the ECB is not far off from the concept of the digital euro.

III. RESULTS AND DISCUSSION

Through existing literature both relevant to general and Indonesian practices of CBDC implementation, this study categorises factors to consider for digital rupiah implementation into five groups, which are financial inclusion (FI), cybersecurity (CS), technological infrastructure (TI), regulatory quality (RQ), and system coexistence (SC). Fig. 2 thus arranges the factors into a framework to consider for digital rupiah implementation.

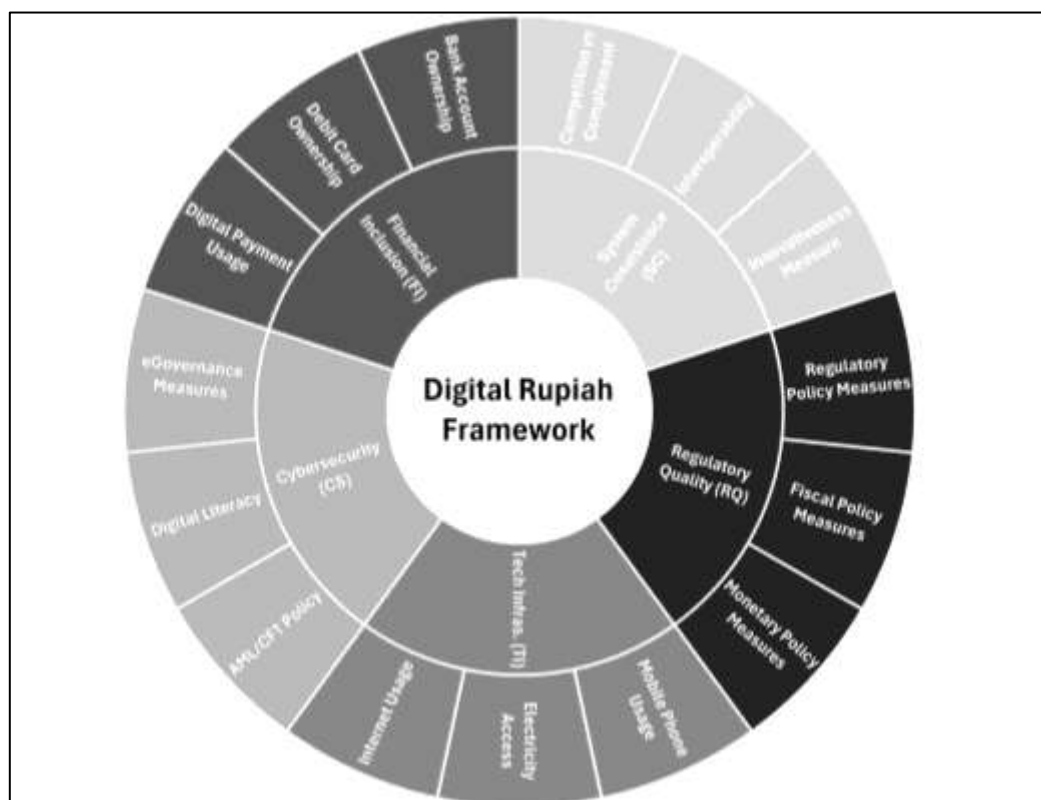


Figure 2. Proposed Digital Rupiah Framework

As per the Presidential Regulation Number 144 of 2020 regarding National Strategy for Financial Inclusion, the aim of financial inclusion is to increase the access for financial services, such as banking services or access to ATMs. Additionally, debit card ownership would be a more relevant observation for Indonesia as studies show fewer use of credit cards in developing economies (Demirgüç-Kunt and Klapper, 2022). Aside from relying on the general populace to ensure their digital literacy is adequate to understand the use of the digital rupiah, the Financial Action Task Force (FATF) recommends a robust anti-money laundering (AML) and counter-terrorist financing standard through policy or eGovernance measures (FATF, 2025). Technological infrastructure is observed through access to the internet, electricity, and mobile phones with access to financial services (Maryaningsih *et al.*, 2022) based on the assumption that the digital rupiah system will function and be distributed in a similar way to existing payment systems such as the QRIS. As a national symbol serving as legal tender, the rupiah has laws that defines it and thus the same would apply to the digital rupiah, with regulatory quality having to cover aspects of monetary, fiscal, and legal policies. Lastly, with a robust financial payment ecosystem already in place, the digital rupiah should navigate how it can promote coexistence through innovation and complementary systems, similar to how QRIS functions (Bank Indonesia, 2020).

The proposed framework for the digital rupiah serves as a theoretical starting point for future studies on Indonesia's path to advanced CBDC research. As of this study's date, Indonesia is currently in the proof of concept stage whereas the next step would be moving towards the pilot stage, thus leaving room for additions in the framework. Directions for future research would be to utilise a quantitative methodology to observe variables that adequately represent the factors of the framework or a qualitative methodology to determine user perceptions and confirming the framework. This study thus contributes towards the digital rupiah's journey for advancing towards the next research stage and eventually reach the goals aligned by Bank Indonesia in their white paper.

REFERENCES

- [1]. Abdullahi, M., & Abdullah, N. L. (2024). Determinants of intention to adopt the Nigerian digital currency, the eNaira, for financial transactions in Abuja, Nigeria. *Journal of Governance and Integrity*, 7(2), 762–769. <https://doi.org/10.15282/jgi.7.2.2024.11046>
- [2]. Akpan, U., & Umaru, A. (2024). Can the e-Naira Foster Financial Inclusion in Nigeria? Evidence from Structural Equation Model. <https://doi.org/10.21203/rs.3.rs-3861545/v1>

- [3]. Alfari, A. J. K., Kumpamool, C., Nguyen, D. T. K., & Ahmed, R. (2023). The determinants of issuing central bank digital currencies. *Research in International Business and Finance*, 64, 101884. <https://doi.org/10.1016/j.ribaf.2023.101884>
- [4]. Auer, R., Cornelli, G., & Frost, J. (2023). Rise of the Central Bank Digital Currencies. *International Journal of Central Banking*, 19(4).
- [5]. Bank Indonesia. (2020). Quick Response Code Indonesian Standard (QRIS). <https://www.bi.go.id/en/fungsi-utama/sistem-pembayaran/ritel/kanal-layanan/QRIS/default.aspx>
- [6]. Bank Indonesia. (2022). Project Garuda: Navigating the Architecture of Digital Rupiah.
- [7]. Bharath, A., Paduraru, A., & Gaidosch, T. (2024). Cyber Resilience of the Central Bank Digital Currency Ecosystem. *Fintech Notes*, 2024(003), 1. <https://doi.org/10.5089/9798400286995.063>
- [8]. Bilgen, C., Dutto, M., & Colberg, T. (2024). Analyzing the CBDC Tree: The Case of the Bahamian Sand Dollar Using Three-Level Central Bank Digital Currency Design Framework.
- [9]. Chu, Y., Lee, J., Kim, S., Kim, H., Yoon, Y., & Chung, H. (2022). Review of Offline Payment Function of CBDC Considering Security Requirements. *Applied Sciences*, 12(9), 4488. <https://doi.org/10.3390/app12094488>
- [10]. Demirgüç-Kunt, A., & Klapper, L. (2022). The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. The World Bank. <https://doi.org/10.1596/978-1-4648-1897-4>
- [11]. Dunbar, K., & Treku, D. N. (2024). Examining the impact of a central bank digital currency on the access to banking. *International Review of Financial Analysis*, 93, 103220. <https://doi.org/10.1016/j.irfa.2024.103220>
- [12]. Durigan Junior, C. A., De Mesquita Spinola, M., Franco Goncalves, R., & Barbin Laurindo, F. J. (2022). CENTRAL BANK DIGITAL CURRENCIES: THE ADVENT OF ITS IT GOVERNANCE IN THE FINANCIAL MARKETS. 19th CONTECSI International Conference on Information Systems and Technology Management. 19th CONTECSI International Conference on Information Systems and Technology Management. <https://doi.org/10.5748/19CONTECSI/PSE/ITM/6914>
- [13]. Fabris, N. (2019). Cashless Society – The Future of Money or a Utopia? *Journal of Central Banking Theory and Practice*, 8(1), 53–66. <https://doi.org/10.2478/jcbtp-2019-0003>
- [14]. Fadli, J. A., Rusmanto, T., Kurniawan, Y., & Hutagaol-Martowidjojo, Y. (2025). The Interplay of Financial Availability, Herding Behavior, and Cryptocurrency Investment Experience Moderated by Government Policy: A Study from Indonesia. *Qubahan Academic Journal*, 4(4), 509–527. <https://doi.org/10.48161/qaj.v4n4a1144>
- [15]. FATF (2012-2025), International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation, FATF, www.fatf-gafi.org/en/publications/Fatfrecommendations/Fatfrecommendations.html
- [16]. Firdaus, S. P. (2023). Urgency of Money Laundering Policy Reform for Digital Rupiah Implementation. *AML/CFT Journal The Journal of Anti Money Laundering and Countering the Financing of Terrorism*, 2(1), 58–82. <https://doi.org/10.59593/amlcft.2023.v2i1.118>
- [17]. Grigalashvili, V. (2022). E-government and E-governance: Various or Multifarious Concepts. *International Journal of Scientific and Management Research*, 05(01), 183–196. <https://doi.org/10.37502/IJSMR.2022.5111>
- [18]. International Monetary Fund. (2023, November 14). Central Bank Digital Currency—Initial Considerations. IMF. <https://www.imf.org/en/Publications/Policy-Papers/Issues/2023/11/14/Central-Bank-Digital-Currency-Initial-Considerations-541466>
- [19]. Koparan, A. (2025). Central Bank Digital Currencies: A review of global trends in adoption, financial inclusion, and the role of country characteristics. *Investment Management and Financial Innovations*, 22(1), 107–121. [https://doi.org/10.21511/imfi.22\(1\).2025.09](https://doi.org/10.21511/imfi.22(1).2025.09)
- [20]. Lewis, B. D., & Oosterman, A. (2011). SUB-NATIONAL GOVERNMENT CAPITAL SPENDING IN INDONESIA: LEVEL, STRUCTURE, AND FINANCING. *Public Administration and Development*, 31(3), 149–158. <https://doi.org/10.1002/pad.582>
- [21]. Liu, J., & Serletis, A. (2019). Volatility in the Cryptocurrency Market. *Open Economies Review*, 30(4), 779–811. <https://doi.org/10.1007/s11079-019-09547-5>
- [22]. Malodia, S., Dhir, A., Mishra, M., & Bhatti, Z. A. (2021). Future of e-Government: An integrated conceptual framework. *Technological Forecasting and Social Change*, 173, 121102. <https://doi.org/10.1016/j.techfore.2021.121102>
- [23]. Maryaningsih, N., Nazara, S., Kacaribu, F. N., & Juhro, S. M. (2022). CENTRAL BANK DIGITAL CURRENCY: WHAT FACTORS DETERMINE ITS ADOPTION? *Buletin Ekonomi Moneter Dan Perbankan*, 25(1), 1–24. <https://doi.org/10.21098/bemp.v25i1.1979>

- [24]. Mooij, A. M. (2023). The role of the European Central Bank in response to COVID19. An evaluation of its mandate. *Journal of European Integration*, 45(4), 649–663. <https://doi.org/10.1080/07036337.2022.2120479>
- [25]. Nurqamarani, A. S., Fadilla, S., & Juliana, A. (2024). Revolutionizing Payment Systems: The Integration of TRAM and Trust in QRIS Adoption for Micro, Small, and Medium Enterprises in Indonesia. *Journal of Information Systems Engineering and Business Intelligence*, 10(3), 314–327. <https://doi.org/10.20473/jisebi.10.3.314-327>
- [26]. Omotubora, A. (2024). Same Naira, More Possibilities! Assessing the Legal Status of the eNaira and Its Potential for Privacy and Inclusion. *Journal of African Law*, 68(2), 245–262. <https://doi.org/10.1017/S0021855324000044>
- [27]. Putri, A. M., Wiryono, S. K., Damayanti, S. M., & Aswin, R. (2023). Framework of Digital Financial Literacy Dimensions in Indonesia. <https://kurdishstudies.net/menu-script/index.php/KS/article/view/1428>
- [28]. Putri, T., Amiludin, A., Ahmad, D. N., & Hidayatulloh, H. (2023). Inadequate Cryptocurrency and Money Laundering Regulations in Indonesia (Comparative Law of US and Germany). *Yustisia Jurnal Hukum*, 12(2), 129. <https://doi.org/10.20961/yustisia.v12i2.71835>
- [29]. Ramadhani, R., Farisy, Z., & Puteri, D. S. (2025). COMPARATIVE ANALYSIS OF CBDC AND TAX LAW ENFORCEMENT IN SELECTED COUNTRIES. *Journal of Central Banking Law and Institutions*, 4(1), 141–180. <https://doi.org/10.21098/jcli.v4i1.275>
- [30]. Ramayanti, R., Azhar, Z., & Nik Azman, N. H. (2025). Factors influencing intentions to use QRIS: A two-staged PLS-SEM and ANN approach. *Telematics and Informatics Reports*, 17, 100185. <https://doi.org/10.1016/j.teler.2024.100185>
- [31]. Santoso, W. Y., Putra, A. A., Susanti, L., & Rahman, F. (2023). DESIGN ELEMENTS AND RISKS OF CENTRAL BANK DIGITAL CURRENCY IN TAILORING A PRUDENT ‘RUPIAH DIGITAL’. *Diponegoro Law Review*, 8(2), 141–158. <https://doi.org/10.14710/dilrev.8.2.2023.141-158>
- [32]. Sonjaya, A., Ragimun, Basmar, E., Ermawati, T., Kurniadi, A. P., Dasilva, H., Sabilla, K., Hasan, Takhim, M., Pratiwi, R., Mutaqin, & Yosepha, S. Y. (2025). How the Integration of Payment Systems Through QRIS Accelerates Economic and Financial Cooperation in the ASEAN Region. *International Journal of Sustainable Development and Planning*, 20(3). <https://doi.org/10.18280/ijstdp.200305>
- [33]. Tan, B. J. (2024). Central bank digital currency and financial inclusion. *Journal of Macroeconomics*, 81, 103620. <https://doi.org/10.1016/j.jmacro.2024.103620>
- [34]. Usman, O., Hardini, I. R., & Kasofi, A. (2025). Integrated QR payment system: Cashless payment solution in developing countries from the perspective of MSMEs. *International Journal of Innovative Research and Scientific Studies*, 8(2), 1424–1432. <https://doi.org/10.53894/ijriss.v8i2.5470>
- [35]. Wenker, K. (2022). Retail Central Bank Digital Currencies (CBDC), Disintermediation and Financial Privacy: The Case of the Bahamian Sand Dollar. *FinTech*, 1(4), Article 4. <https://doi.org/10.3390/fintech1040026>
- [36]. Wu, J., Liu, X., & Zhang, C. (2024). Unveiling the influencing mechanism underlying users' adoption and recommend intentions of central bank digital currency: A behavioral reasoning theory perspective. *Journal of Retailing and Consumer Services*, 81, 104050. <https://doi.org/10.1016/j.jretconser.2024.104050>
- [37]. Xu, C., & Jin, B. (2022). Digital currency in China: Pilot implementations, legal challenges and prospects. *Juridical Tribune*, 12(2). <https://doi.org/10.24818/TBJ/2022/12/2.02>
- [38]. Zams, B. M., Indrastuti, R., Pangensa, A. G., Hasniawati, N. A., Zahra, F. A., & Fauziah, I. A. (2020). DESIGNING CENTRAL BANK DIGITAL CURRENCY FOR INDONESIA: THE DELPHI–ANALYTIC NETWORK PROCESS. *Buletin Ekonomi Moneter Dan Perbankan*, 23(3), 413–440. <https://doi.org/10.21098/bemp.v23i3.1351>

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