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Digital Rupiah as a Proponent of Financial Inclusion: A Study of Legal Strengthening Aspects

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Abstract.
The public's need for a payment system that is fast and inexpensive but also secure, inspired Bank Indonesia to create a digital currency known as the Digital Rupiah. The basis for Bank Indonesia's consideration of launching the Digital Rupiah is to carry out its mandate in the digital era in the form of legal digital payment instruments so that it can become a means of supporting financial innovation. However, the potential for Digital Rupiah as financing inclusion or exclusion is also a crucial matter that needs to be studied in more depth. This study uses a type of normative legal research with data sources through library research, which will analyze the potential for financial inclusion and exclusion and examine the strengthening of the Digital Rupiah from a legal perspective. The results of this study indicate that there is still potential for financial exclusion posed by Digital Rupiah, therefore a strategy is needed to open up opportunities for financial inclusion from Bank Indonesia, regulators, ministries, and other institutions in efforts to provide financial services to the wider communities. This also includes supporting greater digital economic and financial integration that are equitable and sustainable for all the people. The provisions for Digital Rupiah that have been embedded in the P2SK Law are still minimal because the provisions for managing them have not been fully explained. So it is necessary to strengthen the regulation of several aspects so that Digital Rupiah can become a financial inclusion requirement.

Keywords: digital Rupiah, financial inclusion, legal reinforcement

1. INTRODUCTION

The flow of digitalization in the economic and financial sectors after the Covid-19 pandemic conditions developed quite rapidly [1]. People's behavior in transactions is starting to shift towards online, this is as a result of policies restricting social mobility (social distancing) in several countries. One phenomenon that has begun to exist in society as a result of digitalization is cryptoizing [2]. Cryptoizing is a community activity in substituting legitimate local currency with crypto assets. Even so, there is no provision in Law Number 7 of 2011 concerning Currency that mentions cryptocurrency or digital currency. Bitcoin as the most popular crypto asset uses its currency and has its exchange rate and can experience price fluctuations at any time according to the algorithm made in Bitcoin itself [3]. This phenomenon then forced the Central Banks in the world, including Indonesia, to calibrate their policy approaches.

The target of public policy (public policy objective) in the context of digital transformation is limited to how the payment system works and the scope of public access efforts to trusted money through the digital platform itself. This innovation in the financial sector will certainly change the foundation of the Central Bank and bring about a revolution for users of financial services. Not only to meet the needs of the public for fast, safe, cheap, easy, and reliable transactions but in the current digital era it is necessary to prepare solutions to ensure the effective implementation of the mandate of the Indonesian Central Bank.

The solution that is seen as capable of meeting people's needs for transactions in today's digital era is CBDC (Central Bank Digital Currency) [4]. CBDC is digital money that is issued and its circulation is controlled by the Central Bank in a country and is used as a legal means of payment to replace currency. CBDC itself acts as a digital representation of the currency in a country. Currently, Indonesia is familiar with and facilitated by the use of payment methods such as digital wallets, electronic money, and other digital payment systems which include payments via Go-Pay, Shopee Pay, OVO, LinkAja, and QRIS. The difference between Indonesia's CBDC itself and electronic money (e-money) is that Digital Rupiah is issued by Indonesia as the monetary authority, while electronic money is also possible to be issued by the private sector or non-banking institutions.

Issuance of CBDCs is not an easy matter, bearing in mind that the role of the Central Bank in formulating CBDCs needs to be planned in a measurable and precise manner so that the presence of the Digital Rupiah itself does not create a counterproductive effect on the country's economy [5]. So that the implementation of the Digital Rupiah design needs to be balanced with good regulations and policies. Legal aspects of consumer protection, personal data protection [6], financial integration regarding anti-money laundering commitments as well as preventing the financing of terrorism are things that need to be focused on in the formulation of policy aspects.

Along with adaptive steps towards digitalization developments can certainly trigger financial risks that need to be anticipated. These risks are in the form of shadow banking, risks to cyber security, and fraud which include misuse of consumer data, unfair business competition, money laundering, and terrorism financing. Of course, these risks will disrupt the smooth running of the financial system, monetary stability, and payment system due to the difficulty in enforcing the law on digital business.

The potential for Digital Rupiah as financing inclusion or exclusion is also a matter of particular concern. Especially now that the main challenge facing Indonesia is economic recovery which is still not optimal, one of which is the low inflation rate which is still below the central bank's target [7]. Then the normalization of monetary policy (tapering off) by the United States central bank creates uncertainty in the country's financial markets. Digital Rupiah is indeed a financing innovation that needs to be developed, but it needs to pay attention to its security aspects so that it can be well received by the public [8]. Not to mention the issue of Digital Rupiah's status as a legal tender, which currently does not have a legal basis. According to Law Number 7 of 2011 concerning Currency, the legal means of payment is the Rupiah in the form of banknotes and coins. Issuance of Digital Rupiah requires additional authority for BI. For example, stricter supervision of Digital Rupiah-based transactions.

It is interesting to study this article regarding Digital Rupiah as a Supporter of Financial Inclusion: A Study of Legal Strengthening Aspects, especially about the main challenges faced by Central Banks in terms of future-proof solutions that can maintain public trust in the digital era.

Several previous writings became the author's references in this paper. First, a scientific article entitled "Going Rupiah Digital: Some Considerations From Sovereignty" by Zahrashafa Putri Mahardika, et al provides references to aspects of sovereignty and cyber security against Digital Rupiah, and the "Potential of Digital Rupiah to Become a New Solution for Eradicating Corruption in the Indonesian Government" by Dyah Tiara Anggraeni, et al who provided references regarding the potential for inclusion of Digital Rupiah in eradicating corruption in Indonesia [9].

2. METHODOLOGY/ MATERIALS

This study uses a type of normative legal research with data sources reviewed through library research, including primary legal materials, namely statutory regulations that have relevance to the study of digitization of payments through Digital Rupiah, and secondary legal sources such as scientific journals, books, and articles related to this research study. The analysis process was carried out from the beginning to the end of the research, to describe the concept of Digital Rupiah as the development of a future payment system as well as the inclusion and exclusion concepts of financial financing through Digital Rupiah.

3. RESULTS AND DISCUSSIONS

3.1. Digital Rupiah as Payment System Development in the Digitalization Era

Increasingly sophisticated technological developments have driven the digitalization process in every aspect of people's lives, one of which is economic and financial transactions. The trend of trading using digital currencies is currently on the rise, especially after many people have created and traded digital investment instruments in the form of invisible coins, namely crypto. The emergence of cryptocurrency itself was motivated by the need to speed up the process of cross-border transfers at an affordable cost. Decentralized blockchain technology facilitates transactions without going through formal banking policies. However, on the other hand, this blockchain system has drawbacks, some of which are high levels of volatility which can lead to high-risk financial instruments when used as a store of value, then mining activities that require large electrical energy, and the most important risk that cryptocurrency can be used to finance criminal activities because this decentralized blockchain system is outside the control of the government.

When the joints of the economy began to move online and digital currency became the future of the financial system, several countries began to tighten the use of cryptocurrencies as a means of payment [10]. There are even countries such as China, Algeria, Bangladesh, Ecuador, Turkey, and North Macedonia that have completely banned the use of cryptocurrency as a payment method in trade because it can disrupt the country's financial circulation. Indonesia itself is a country that does not prohibit cryptocurrency mining or the use of technology, only if it is used as a means of payment, this cryptocurrency is prohibited. First, because of its nature, it cannot be controlled by the monetary authority (Central Bank). Then secondly, the cryptocurrency itself is contrary to Law Number 7 of 2011 concerning Currency, specifically Article 2 which explains that the currency of the Unitary State of the Republic of Indonesia is the rupiah. So cryptocurrency restrictions are only allowed to the extent of their use as investments or assets.

Apart from cryptocurrencies, currently, there is also digital money that is widely used by the public, namely electronic money (e-money) [11]. This electronic payment instrument allows users to transact via electronic media by first depositing money with the issuer. When money is used, the value of stored electronic money will be reduced by the transaction value and then the balance can be topped up/top up again.

It is undeniable that everyone needs a payment system that is fast and cheap but also secure, therefore the Central Bank creates a digital currency known as the Central Bank Digital Currency (CBDC) which is legally managed by the monetary authority (Central Bank). in each country. The state's need for developing digital money depends on the condition of its economic information technology infrastructure because this will affect different public responses to a policy [12]. The Central Bank itself has the main motivation for creating a CBDC as payment efficiency, financial inclusion, efficiency in printing physical money (cash), and security in payment mechanisms. CBDC is a new form of Central Bank money that is also the responsibility of the Central Bank to have the same domination as the official currency and can be used as a medium of exchange, a unit of account, or a store of value. So that the CBDC and the currency used now have the same value and can be used for the same activities, only the shape is not the same.

Rupiah Digital by the central bank is deemed capable of filling that gap. The issuance of the Digital Rupiah was first discussed at Bank Indonesia's annual meeting in 2022, the details of which are planned in a white paper called the Garuda project, taking into account the principles, benefits, and risks. Bank Indonesia is the sole authority that issues Digital Rupiah and through this Digital Rupiah, it is hoped that it will strengthen Bank Indonesia's role in accelerating financial economic integration nationally.

Digital Rupiah is fully regulated by the central authority/government, in contrast to decentralized cryptocurrency. Regarding asset ownership, cryptocurrency is completely in the hands of its users, besides that transaction details are available to the public without showing personal data such as real names so that they are not traced and can be easily used for speculative activities with values that also fluctuate depending on market values. Meanwhile, the value of digital currency/CBDC follows the value in the official currency so that it can only be used for payments and other monetary transactions. It can be said that CBDC is trusted money or money in digital form that can be trusted.

The Digital Rupiah concept, like the CBDC that has been in effect in several other countries, is a good signal for Indonesia, this is an effort to be able to match steps, especially in improving the economic ecosystem in the digital era [13]. Its presence also does not affect the amount of physical money in circulation, its value is stable and is denominated the same as the rupiah currency.

There are several challenges faced by the Central Bank about several challenges in implementing Rupiah Digital Literacy and inclusion for the community which still requires more time in conveying it to the community. Digital Rupiah is not just a physical currency

TABLE 1: Countries that have implemented CBDC (*Central Bank Digital Currency*).

Country	CBDC	Central Bank	Year of Issue
Bahamas	Sand Dollar	Central Ban of Bahama (CBOB)	2020
Nigeria	eNaira	Central Bank of Nigeria (CBN)	2021
East Caribbean Union	DCash	Eastern Caribbean Central Bank (ECCB)	2022
Russia	Digital Ruble	Central Bank of Russia (CBR)	2022
Brazil	PIX	Central Bank of Brazil (BCB)	2022
China	Digital Yuan	People's Bank of China (PBC)	2022
India	Digital Rupee	Reserve Bank of India (RBI)	2022
Korea	Digital Won	Bank of Korea (BOK)	2022
Japan	Digital Yen	Bank of Japan (BOJ)	2022
Ukraine	e-hryvnia	Nasional Bank of Ukrania (NBU)	2022

that is transformed into a digital form, but other consequences require the addition of other authorities for Bank Indonesia [14].

Financial exclusion is difficulty in accessing and/or using financial services, which results in a person's inability to meet their needs and is unable to lead a social life in the society in which they live. The potential for financial exclusion that can occur from Digital Rupiah is that people become unbanked, both from the public side and from service providers. Several factors influence this, including because the cost of opening a bank account is expensive, and people are not aware of any information.

Then related to the readiness of supporting infrastructure, several regions in Indonesia still have limited electricity, many natural disasters such as earthquakes occur, and automatic ATMs (Automated Teller Machines) cannot be used. The impact means that everyone who has savings cannot withdraw their savings. In addition, not all Indonesians also have tools that support the use of digital currency.

Efforts to reduce the potential for financial exclusion can be carried out by firstly compiling the country's national strategy through various separate programs, for example, financial education to the public, then secondly providing appropriate service facilities for example to the government and migrant workers (TKI) before finally being able to slowly be used by the general public in a good, safe, and structured manner.

Relevant ministries include the Coordinating Ministry for Economic Affairs, Coordinating Ministry for People's Welfare, Ministry of Finance, Ministry of BUMN, Ministry of National Development Planning/Bappenas, Ministry of Home Affairs, Ministry of Cooperatives & UMKM, Ministry of Agriculture, Ministry of Communication and Information, Ministry of Manpower and Transmigration, Ministry of Marine Affairs and Fisheries,

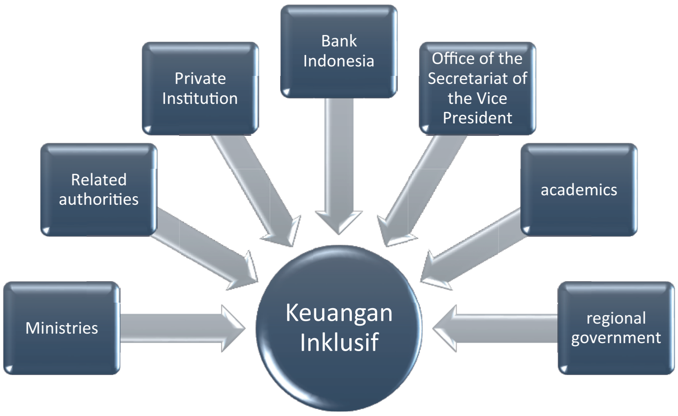

Figure 1: Parties in Realizing Financial Inclusion.

Ministry of Industry, Ministry of Trade, Ministry of Health, Ministry of Religion, and Ministry of Public Works.

Related authorities include the Financial Services Authority (OJK), and the Financial Transaction Reports and Analysis Center (PPATK). Private Parties include Banking, Association, Telco, etc. Bank Indonesia includes the Head Office and Representative Offices. The Office of the Vice President's Secretariat includes the National Team for the Acceleration of Poverty Reduction (TNP2K).

An inclusive financial strategy is not an isolated initiative, so involvement in making it happen is not the unilateral task of Bank Indonesia, but also of regulators, ministries, and other institutions in efforts to provide financial services to the wider community. Through the national financial inclusion strategy, it is hoped that collaboration between government institutions and stakeholders will be created in a good and structured manner.

With these inclusive financial efforts, it is hoped that CBDC Indonesia, namely Rupiah Digital, will be able to maintain rupiah sovereignty in the digital era, including supporting digital economic and financial integration and most importantly, opening opportunities for more equitable and sustainable financial inclusion for all people.

3.2. Strengthening Legal Aspects of Digital Rupiah to Create Financial Inclusion

Financial Services Authority Regulation Number 76/POJK.07/2016 concerning Increasing Literacy and Inclusion explains that financial inclusion is the availability of access to financial services in improving people's welfare according to the needs and capabilities of the community [15]. If properly designed, CBDCs will be able to encourage financial inclusion, especially through design features that allow CBDCs to be transacted offline to reach people who live in remote areas (blank spot areas). The benefits & functions of CBDC include increasing efficiency, stability, and security of payments, financial inclusion, namely that all parties can be involved in payments, digital payments/digital cash, financial stability, cost reduction/decreasing costs in payments, alternatives to crypto assets, and monetary & national policies from the Central Bank itself. It cannot be denied that the issuance of the Digital Rupiah was triggered due to the rise of crypto assets used as a financial system amid the digitalization era.

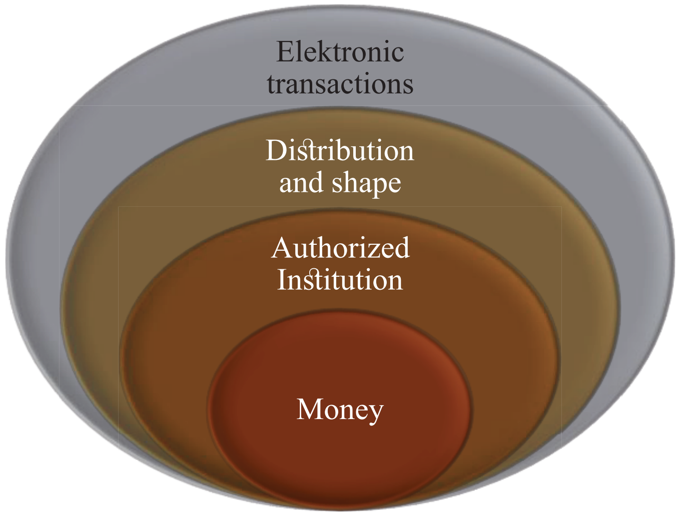

Figure 2: Legal Aspects of Digital Rupiah.

Money has an important role in economic circulation, so it is important to know the legal aspects of it. Especially when there is talk of adding a new alternative in payment through Digital Rupiah, an explanation of this scope is important so that the search for a juridical basis is right on target in answering the concept of Digital Rupiah. In finding the basis for Digital Rupiah terminology, the lex generalis basis is an explanation of money. In the provisions of Article 1 number 2, it is explained that money is legal tender issued by Bank Indonesia as the Central Bank of the Republic of Indonesia which has the sole authority in issuing money. With this definition, conventionally it has been answered that money will bear the title of rupiah when it is issued by the competent authority, both consisting of paper rupiah and metal rupiah.

The provisions for electronic money (e-money) payment methods have begun to be regulated in Bank Indonesia Regulation No. 18/17/PBI/2026 concerning the second amendment to Bank Indonesia Regulation No. 11/12/PBI/2009 concerning Electronic Money where e-money, as a means of payment is issued based on the value of money deposited in advance by the holder to the issuer, the value of money, is stored electronically in the form of a server/chip and is used as a means of payment to merchants who not the issuer of the electronic money. It should be noted that the value of electronic money deposited by the holder by the issuer is not a deposit as the banking function is regulated in the law [16]. Electronic money as a means of payment has a legal status and is authorized by the State so transactions using the e-money payment method must be accepted.

The concept of electronic money in Law Number 19 of 2016 concerning Amendments to Law Number 11 of 2008 concerning Information and Electronic Transactions is contained in Article 1 number 2 which states that electronic transactions are legal actions carried out using computers, computer networks, and/or other electronic media. So that all exchanges of information carried out through electronic media can be regarded as electronic transactions.

The e-cashless method of depositing a certain amount of money with the issuer, then storing it in electronic media before making a transaction can certainly make it difficult for the spread of counterfeit money [17]. However, related to the security system, it is necessary for the system operator to design a verification and authorization system in the form of a PIN or password for a transaction. The goal is that organizers can be held accountable for carrying out their activities.

The concept of electronic money, which has made it easier for the public to make transactions quickly, precisely, and efficiently, is one of the reasons for the Central Bank to create the Digital Rupiah. Digital Rupiah as a manifestation of the Central Bank's adaptive and responsive attitude towards the development of economic digitalization must also be balanced with regulations on security and strict supervision from the competent authorities so that the presence of this Digital Rupiah can maintain the effectiveness of monetary policy and maintain financial system stability.

The potential for financial exclusion by using technological systems. Digitalization of the economy and finance has risks that need to be anticipated, including cyber risks and fraud, shadow banking, unfair business competition, money laundering, and even financing of terrorism. So it is necessary to strengthen the legal aspects governing cyber security as a platform for Rupiah Digital [18].

The potential for financial inclusion Digital money includes increasing efficiency and reducing the cost of the country's currency management system as long as the Central Bank can provide a stable and regulated digital currency [19]. Availability of access to various financial institutions, products, and services. Digital money will reduce the cost of payment services, encourage competition between financial institutions and plan to make digital money available offline.

The implementation of digital literacy, education, and financial inclusion is carried out simultaneously to ensure that policy effectiveness in the context of digital currency applies efficiently and effectively in the market [20]. Because even now the cryptocurrency user community is still asking questions and trying to find information because the enactment of the CBDC in Indonesia in the future will make Bank Indonesia the sole supplier in the context of the financing mechanism. However, the big question is how to use a cryptocurrency that still exists today.

The information stage which begins with the public consultation stage (consultative paper and Focus Group Discussion), technology experimentation (proof of concept), prototyping, and piloting, and ends with a review of policy stances is the principle of experimentation which is carried out by absorbing people's aspirations to then conduct trials or test in public whether it is successful or not and of course with the adjustments that continue to grow.

Bank Indonesia has tried to take advantage of the momentum of digital world development as an opportunity for Digital Rupiah currency in recent years. Undeniably, the post-pandemic condition of Covid-19 has contributed to a kind of social behavior that has started to feel comfortable entering digital platforms. The development of electronic money has also surpassed the currency in circulation. Moreover, there was an agreement at the meeting of the Minister of Finance and the Governors of the Central Bank G20 (FMCBG) on 12-13 October 2022 which discussed one of the six priority issues in the discussion of the finance track on the Global Economy on CBDC.

The urgency of strengthening the legal regulation of the Digital Rupiah as a legal tender in Indonesia includes facilitating fast and efficient technology-based payment alternatives [21], as well as safe to meet the needs of the community, limiting the circulation of cryptocurrency, and in particular support the implementation of monetary policy, stability of the payment system, and the financial system through efficiency in distribution and transactions.

The basis for regulating the Digital Rupiah is contained in Law Number 4 of 2023 concerning the Development and Strengthening of the Financial Sector (UU P2SK), especially in article 14A whose content regulates the management of Digital Rupiah which includes planning, issuance, circulation, and administration. This management takes into account several aspects, including the supply of Digital Rupiah as legal tender in Indonesia, the effectiveness of carrying out Bank Indonesia's duties in maintaining monetary stability, support for digital financial inclusion, nationally integrated economic development, and utilization of digital technology that can guarantee system security. data and information as well as protection of personal data [22].

The provisions for Digital Rupiah that have been embedded in the P2SK Law are still minimal because the provisions for managing them have not been fully explained. First, the general principles that formulate the range of use of Digital Rupiah, both domestically and abroad. To realize comprehensive arrangements, especially in the aspect of using Digital Rupiah in international activities and supporting economic development, it is necessary to regulate the Policy for Using Digital Rupiah in International activities. Even though in general the regulations regarding the use of rupiah in international activities are contained in Bank Indonesia Regulation Number 24/6/PBI/2022 concerning Policy on the Use of Rupiah in International Activities, the scope of types of money in this regulation is limited to banknotes and coins. only and has not yet reached the digital currency, namely Rupiah Digital.

Second, general principles based on Law Number 11 of 2008 concerning Information and Electronic Transactions and Law Number 3 of 2011 concerning fund transfers as operational regulatory parameters. Rupiah Digital will complement the electronic exchange tool that is commonly used by the public, namely e-money. This breakthrough certainly attracts public attention to its implementation, especially from market players. To minimize fears of speculation that is not appropriate to cause concern, it is necessary to address it by strengthening regulations in terms of cybersecurity and sustainability of the Digital Rupiah, because Digital Rupiah security standards and the development of good technology designs can mitigate cyber security risks as a whole.

Third, Regulations concerning Digital Rupiah Identification include the characteristics of authenticity and safeguarding it from counterfeiting [23]. The rupiah design is contained in Bank Indonesia Regulation Number 21/10/PBI/2019 concerning Money Management Rupiah is limited to banknotes and coins. Rules for the design of the rupiah in digital form are urgently needed given the widespread circulation of counterfeit money used by the public as a means of payment.

Fourth, regarding the requirements for a technology platform in terms of operating Rupiah Digital (which is compatible, safe, and reliable). There are two Digital Rupiah designs offered by Bank Indonesia through the Garuda Project whitepaper, namely Wholesalers or distributors (W-Digital Rupiah) and Retailers or retail (R-Digital Rupiah). It is hoped that legal strengthening of the Implementation of the Digital Rupiah on all types of platforms will provide benefits to the community such as easy access to payment systems, lower transfer fees, and higher security.

4. CONCLUSION AND RECOMMENDATION

The potential for financial exclusion that can occur from Digital Rupiah is that people become unbanked, both from the public side and from service providers. The factors include the high cost of opening a bank account and the people's ignorance of this information. Efforts to reduce the potential for financial exclusion are based on a national strategy through increasing public literacy and the readiness of its supporting infrastructure such as financial education to the public and providing good, safe, and structured service facilities.

Strengthening the legal regulation of the Digital Rupiah as a legal means of payment in Indonesia includes the formulation of regulations regarding the scope of use of the Digital Rupiah only domestically and abroad, the formulation of regulations regarding Digital Rupiah cybersecurity, the formulation of regulations regarding the identification of Digital Rupiah which includes the characteristics of authenticity and regarding securing it from counterfeiting, and formulating regulations regarding the effectiveness of technology platforms in terms of operating Rupiah Digital.

The advice given regarding this study is to strengthen regulations and policies regarding Digital Rupiah while still paying attention to security and convenience for users, because if not then it is likely that people will not be interested in using Digital Rupiah and prefer to use digital wallets or electronic money. Thus Digital Rupiah is not a solution to the need for financial inclusion, on the contrary, it will become a risk of financial exclusion for the public when they decide to approve opening an account.

References

[1] Apriani SZ, Kaban RF, Pasaribu PN. “Ekonomi Bisnis the digital asset contribution toward the MSME ’ s Performance in Bekasi during Kontribusi Aset Digital Terhadap Kinerja UMKM Kota Bekasi di Era Pandemi.” 2021;26(July):65–75. doi: https://doi.org/10.17977/um042v26i2p65-75.

[2] Pratama A, Mukhlis I, Agustin G. As an investment, can crypto affect Rupiah exchange rate? and vice versa : Indonesia's evidence. Am Int J Bus Manag. 2022;5(04):26–33.

[3] Alam S, Jamil M, Syamsir A. Digital currency in Indonesia (Prospects and Challenges in Inclusive Financial Reviews). J Ad'ministrare. 2022;9(2):515.

[4] B. Indonesia, Proyek Garuda: Menavigasi Arsitektur Digital Rupiah.

[5] Kumaeroh SP, Sandy MA, Septenta MI, Utami FD, Parasetya MT. Indonesia's digital financial and economic transformation through digitalize redenomination. Int J Sci Appl Sci Conf Ser. 2021;5(1):75–84.

[6] Fatoni Z, Barid VB. Ensuring data privacy and security in Indonesia: Lesson learned from the Covid-19 Pandemic. Business (Atlanta Ga). 2021;9(3):281–303.

[7] Purnawan ME, Riyanti R. Significant effect of the central bank digital currency on the design of monetary policy. J Ekon Indones. 2019;8(1):125–51.

[8] Riyanto A, Primiana IY, Azis Y. “Digital branch: Banking innovation in Indonesia to Face 4.0 industry challenges.” IOP Conf Ser Mater Sci Eng. 2019;662(7):0–7. https://doi.org/10.1088/1757-899X/662/7/072002.

[9] Aggraeni DTP, Munajat E. “Potensi Rupiah Digital Menjadi Solusi Baru Pemberantasan Korupsi Di Pemerintahan Indonesia.” J Ilm Akunt dan Keuang. 2022;4(3):1304–1322.

[10] Nizar MA. “The controversies of digital currency,” Munich Pers RePEc Arch. 2020;(97940):1–22.

[11] Ayudya AC, Wibowo A. “The intention to use E-Money using theory of planned behavior and locus of control.” J Keuang dan Perbank. 2018;22(2):335–349. https://doi.org/10.26905/jkdp.v22i2.1691.

[12] Hadibrata B, Alisajahbana A, Setiawan M, Santoso T. The adoption of digital technology and labor demand in Indonesia’s Banking Sector. Int J Soc Econ. 2018;:14.

[13] Mahardika Z, Permana RB, Maulisa N. Going Digital Rupiah: Some considerations from sovereignty and cybersecurity perspectives. J Cent Bank Law Institutions. 2023;2(1):25–54.

[14] Sari NP. “Keberadaan Uang Elektronik di Masyarakat”. J Ekon Manajemen Bisnis dan Sos. 2021;1(3)(3):271–278.

[15] Sukmawidjaja AF. Dampak kegiatan inklusi keuangan terhadap pengembangan usaha Mikro dan kecil, pembangunan manusia (pendidikan dan kesehatan), dan pertumbuhan Ekonomi di Indonesia. University of Trisakti; 2018.

[16] Pardede AR. “Legalitas Pembayaran Menggunakan Uang Elektronik Asing Wechat Pay di Indonesia.” Ilmu Sos Dan Pendidik. 2019;3(3):209–22.

[17] Ihsan Fairi M, Abidin Sahabuddin Z, Jupriyanto. “Analisis Penerapan Central Bank Digital Currency Dalam Perspektif Keamanan Nasional.” Ekon Pertahanan. 2021;7(2):221–234. [Online]. Available: https://jurnalprodi.idu.ac.id/index.php/EP/article/view/882

[18] Umami R, Jafar MU, Zitri I. Fungsi Hukum Sebagai Bagian Dari Penguatan Ekonomi Di Indonesia. J Ilm Mandala Educ. 2022;8(1):1004–9.

[19] Fauzia AS, Mulatsih S, Alexandi F. Mapping the potential of zakat collection digitally in Indonesia. Int J Zakat. 2021;6(3):1–22.

[20] Hardani DN, Luthfianto T, Tamam MT. “Identify the authenticity of rupiah currency using k nearest neighbor (K-NN) algorithm.” J Ilm Tek Elektro Komput dan Inform (Champaign). 2019;5(1):1–7.

[21] Lisanawati G, Aristo E. Urgensi Pengaturan Hukum Central Bank Digital Currency Dalam Dimensi Anti Pencucian Uang. Verit Justitia. 2022;8(1):49–75.

[22] Dwi Kurniawan K, Kharisma Nuryasinta R, Adhial Fajrin Y, Puspitasari Wardoyo Y, Aunuh N. “The role of Indonesian notary in the transfer of stock through the Waqf mechanism after the Covid-19 pandemic.” KnE Soc Sci. 2022;2022(5):479–91.

[23] Ni’am BA, Faisal M, Arif YM. Identification of nominal value and authenticity of rupiah using support vector machine. IEESE Int J Sci Technol. 2014;3(1):13–20.