

Central Bank Digital Currency (CBDC) Shariah System for Islamic Bank Liquidity Management

Umi Khaerah Pati¹, Sultan²

¹Universitas Sebelas Maret, Indonesia; ²Mahkamah Agung, Indonesia

¹umi_khaera@staff.uns.ac.id; ²sultanaregge@gmail.com

Abstract

The project of Central Bank Digital Currency (CBDC) in many nations is currently focused on conventional characteristics. The majority of the current research has concentrated on the monetary policy ramifications of a retail central bank digital currency (CBDC) that bears interest and operates on a single tier system. CBDC implementation will result in liquidity challenges for Islamic banks. This approach is only suitable for conventional mechanisms of liquidity management, such as the interbank market, secondary market financial instruments, the central bank discount window, and the Lender of Last Resort (LOLR), which are all interest-based. Islamic banks are prohibited from engaging in such activities. This study employed a literature review to investigate the design of Central Bank Digital Currency (CBDC) in accordance with sharia principles and its potential to mitigate the risk of Islamic bank liquidation. The incorporation of Central Bank Digital Currency (CBDC) into the monetary system is an unavoidable development. A retail CBDC, which is not subject to remuneration and does not experience value fluctuations, is considered legally permissible for usage in accordance with Islamic law, as it functions as a fiat currency solely for the purpose of exchange. To help the liquidity of Islamic banks due to use of CBDC, Central banks, therefore, need to either modify traditional instruments or to develop new Sharia'h compliant monetary policy instruments for mechanisms of liquidity management. It is proposed that an integrated e-wallet system adhering to shariah principles should be developed, incorporating a two-step transaction verification process that involves both the user and sharia boards. This system can be compared to Islamic coin. This system guarantees that transactions involving CBDC comply with the principles of Sharia, as defined by Islamic Coin through the use of HAQQ Wallet and Oracle Shariah. This method enables Islamic banks to utilize CBDC in a range of market products that adhere to sharia rules, serving as a means for managing liquidity.

Keywords: Central Bank Digital Currency; Sharia System; Bank Liquidity Management

I. INTRODUCTION

Bank Indonesia has designed a CBDC to accommodate the use of digital money in Indonesia, namely the Garuda Project.¹ In its draft, Bank Indonesia will start exploring CBDC as a legal currency in Indonesia. Central Bank Digital Currency (CBDC) is digital money issued by a country's Central Bank as legal tender for use in daily

¹Bank Indonesia, *Proyek Garuda: Menavigasi Arsitektur Digital Rupiah* (Jakarta: Bank Indonesia, 2022), hlm. 6.

transactions. This new financial instrument is a form of monetary policy adaptation in response to the evolving needs of society.² The majority of Indonesian Muslims put their trust in the Islamic finance industry which in its implementation is in accordance with Islamic law to take care of its financial needs.³ The implementation of CBDC is a new innovation in Islamic banking products in the form of a sharia digital financial system. The activity of issuing money as a sign of the legality of payment instruments in a country, shows that the activity is a matter that is within the protection of the general rules of Islamic shari'a. However, CBDC has similarity with cryptocurrencies as its transactions use a blockchain system. Several academic researchers have discussed the positive and negative aspects of cryptocurrencies.⁴ The positive aspects of Cryptocurrency include: (1) Global: Cryptocurrency can be used all over the world, without geographical restrictions and government regulation. (2) Transparent: Transactions made with cryptocurrencies are recorded in the blockchain openly and visible to everyone. (3) Personal control: Cryptocurrency users have full control over assets, so there is no intervention by other parties such as banks or other financial institutions. (4) Fast and accurate: Cryptocurrency transactions can be processed quickly and accurately because they do not go through intermediaries such as banks or financial institutions.⁵

Islamic scholars hold divergent opinions regarding the sharia compliance of cryptocurrencies. Some opinions say that CBDCs contain haram elements like cryptocurrencies. So far, ongoing CBDC pilot projects, both for the retail and wholesale segments, are still aimed at the conventional financial system. Meanwhile, in the Islamic financial system, CBDCs given remuneration or interest violate sharia principles. If customer savings at bank syariah are withdrawn and transferred into the form of CBDC, Islamic banks will experience liquidation risk, while CBDC will later be accommodated by electronic wallets as deposit storage. The concept of sharia CBDC and a system that can accommodate the sharia CBDC ecosystem are needed as well as the involvement of Islamic banks in the ecosystem to avoid liquidation risks, as well as conventional banking liquidity management mechanisms such as interbank

²David Tercero-Lucas, "Central bank digital currencies and financial stability in a modern monetary system", *Journal of Financial Stability* Vol. 69, Desember 2023, hlm. 1.

³Abdul Ghofur Anshori, *Perbankan Syariah di Indonesia* (Yogyakarta: Gadjah Mada University Press, 2018), hlm. 7.

⁴ Cretien, P.D. (2018), "Cryptocurrencies: price and pairs trading", *Techniques and Tactics*, Vol. 543, pp. 70-73.

⁵ Jalil, A., & Abdillah, H. (2023). Hukum Cryptocurrency sebagai Mata Uang dan sebagai Komoditas (Analisis Fatwa MUI tentang Hukum Cryptocurrency). *Jurnal ilmiah ekonomi islam*, 9(03), 4245-4255. doi: <http://dx.doi.org/10.29040/jiei.v9i3.10269>

market, secondary market financial instruments, central bank discount window, Lender of Last Resort (LOLR).⁶

II. METHODOLOGY

This study focuses on the field of Islamic economic law. The research employed a literature review to investigate the design of Central Bank Digital Currency (CBDC) in accordance with sharia principles and its potential to mitigate the risk of Islamic bank liquidation. In order to address the aforementioned issues, author gathers many perspectives from scholars and Islamic religious authorities to ascertain their viewpoints on sharia-compliant Central Bank Digital Currency (CBDC). Additionally, the author scrutinizes the design employed by sharia virtual currency to ensure its adherence to sharia principles.

III. RESULT AND DISCUSSION

A. Cryptocurrency in The Islamic Law Perspective

Several countries have researched and developed CBDC shariah projects in their countries, such as the United Arab Emirates and Saudi Arabia, which introduced Central Bank Digital Currency (CBDC) under the project name 'Digital Dirham'.⁷ In Turkey, CBDC is being researched focusing on the central bank's digital Turkish Lira wholesale CBDC ('Merkez Bankası Dijital Türk Lirası') with 'identity' and an instant payment system that the central bank operates through the FAST system.⁸ Initially, the Central Bank of Saudi Arabia (SAMA) banned virtual currency trading activities and considered that it had negative consequences and high risks because it was outside government supervision.⁹ In addition, the policies undertaken by SAMA are most likely also influenced by religious considerations, where digital assets have become controversial in the Muslim world. One Saudi cleric, Assim al-Hakeem, revealed that

⁶ Inutu Lukonga, "Monetary Policy Implications of Central Bank Digital Currencies: Perspectives on Jurisdictions with Conventional and Islamic Banking Systems," *IMF Working Papers* 2023, no. 060 (2023), <https://doi.org/10.5089/9798400236532.001>.

⁷ Viktor Boiko, "CENTRAL BANKS DIGITAL CURRENCIES AND PROSPECTS FOR THE UKRAINIAN ECONOMY," *Economics & Education* 6, no. 2 (2021), <https://doi.org/10.30525/2500-946x/2021-2-13>.

⁸ Gökhan Çağlayan et al., "Distributed Ledger Technology Experiments in Retail Payments: Evidence from Turkey Received (in Revised Form): 27th January, 2023," *Journal of Payments Strategy and Systems* 17, no. 2 (2023).

⁹ Mohammed Sallam, "The Role of the Saudi Central Bank in Promoting the Growth of the Electronic Payments Sector in the Kingdom of Saudi Arabia According to Vision 2030," *Journal of Umm Al-Qura University for Sharia'h Sciences and Islamic Studies*, no. 93 (2023), <https://doi.org/10.54940/si61013284>.

crypto assets are prohibited under Islamic law due to their ambiguous nature.¹⁰ Saudi views on cryptocurrencies began to change with the entry of AlZahrani, a former managing director of Accenture who was recruited directly by the Central Bank of SAMA to lead the map of crypto and CBDC development at Saudi Arabia's central bank. Plus, the local community's interest in crypto is already quite high. At least about 3 million Saudis are said to already own crypto. In addition, several public and private companies that are there have also expressed interest in the utilization of blockchain, a key technology in cryptocurrencies. Saudi Arabia is already leveraging the technology to help halal companies track and ascertain the source of ingredients and ensure relevant standards are met. Even oil giant Aramco is investing in developing a blockchain to integrate sensors in oilfields and refineries to check its performance. The activity of issuing money as a sign of the legality of payment instruments in a country, shows that the activity is a matter that is within the protection of the general rules of Islamic Shari'a. This is because the issuance of currency and the determination of the nominal amount in it are fundamental things related to the benefit of the people.

One of the references to the issuance of money in Islamic sharia is in the jurisprudence or economic law of Umar (r.a.) during his reign, Umar argued that the issuance of money was the authority of the *ulil amri* (government), as he said during his tenure as a caliph for the Muslims. The definition of *ulil amri* in this context is the authority assigned by the imam to issue money as previously arranged. Authorities in this field with a commitment to Islamic values can impose limits on the amount of money according to the overall conditions of the Ummah as well as the level of development at that time to encourage economic growth going forward¹¹. In addition to the issuance of money that has the basis of Islamic jurisprudence, transaction and business activities are included in the problem of *muamalah* between humans and fellow humans¹². As is known, the initial law of business transactions is *mubah*, but it can turn out to be haram if there are factors. Business transactions whose laws are haram are grouped into two laws, namely the first haram *lidzatihi*, which indicates that the object of the transaction is haram goods. The second law is haram *lighairihi* which means haram due to causative factors outside the object of the transaction. Another

¹⁰ Hashem Abdullah Alnemer, "Determinants of Digital Banking Adoption in the Kingdom of Saudi Arabia: A Technology Acceptance Model Approach," *Digital Business* 2, no. 2 (2022), <https://doi.org/10.1016/j.digbus.2022.100037>.

¹¹ Syarial Dedi, „Ekonomi Dan Penguasa (Pemikiran Ibn Taimiyah Tentang Mekanisme Pasar)“, *Al-Falah: Journal of Islamic Economics*, 3.1 (2018), 73

¹² Jati, H. S., & Zulfkar, A. A. Transaksi Cryptocurrency Perspektif Hukum Ekonomi Syariah. *Jurnal Al-Adalah: Jurnal Hukum Dan Politik Islam*, 6(2) (2021), 137–148.

aspect that is taken into consideration is on the *madharat* side which tends to outweigh the benefits that can be obtained if used currency for transaction instruments or as commodities.

Islamic scholars hold divergent opinions regarding the sharia compliance of cryptocurrencies. Prominent academics, including the former dean of the Institute of Islamic Banking and Finance at the International Islamic University of Malaysia, Professor Ahmed Kamel Midin Merra, are among them. According to him, for a cryptocurrency to be acknowledged in the Islamic finance sector, it must possess inherent value and not function as a commodity instrument.¹³ The eminent mufti of Egypt, Shaikh Shaki Alam argue that cryptocurrency is unequivocally rejected by him on the grounds that it contravenes sharia principles. Infractions of Sharia principles occur for a variety of reasons.¹⁴ Initially, an element of *gharar* (uncertainty) is present. Subsequently, the actual worth of a currency is obscure. Third, price fluctuations are extreme. The anonymity of the fourth factor makes it susceptible to illicit exploitation. Fifth, variations exist in the methods employed for value determination and valuation. Sixth, it is not regulated by a central bank. Seventh, the volatility of cryptocurrencies is exceptionally high due to the fact that they are susceptible to a variety of influences, including hackers and technical errors.¹⁵ His unequivocal rejection of the cryptocurrency is justified, as it contravenes fundamental Islamic principles and is therefore deemed haram. In order to be deemed halal, an item must adhere to the Maqasid al-Sharia. Sharia scholars are unable to embrace Bitcoin due to the fact that it facilitates transactions that are deemed impermissible of sharia law.¹⁶ Consequently, bitcoin used as a means of payment especially in virtual financial transactions is categorized *as syubhāt*, and everything that *is syubhāt* should be abandoned.

Cryptocurrency is basically imaginary money, but it is sold at a clear price so that the sale is illegal. Thus, the point about the Bitcoin exchange rate, the increase and decrease in the exchange rate is not related to external factors such as the value of imports and exports but depends on public opinion influenced by the marketing /

¹³ Mustafa Raza Rabbani, Shahnawaz Khan, and Eleftherios I. Thalassinis, “FinTech, Blockchain and Islamic Finance: An Extensive Literature Review,” *International Journal of Economics and Business Administration* 8, no. 2 (2020), <https://doi.org/10.35808/ijeba/444>.

¹⁴ Rabbani, Khan, and Thalassinis.

¹⁵ Umi Pati, Pujiyono Pujiyono, and Pranoto Pranoto, “Sharia Fintech as a Sharia Compliance Solution in the Optimization of Electronic-Based Mosque’s Ziswaf Management,” *PADJADJARAN Jurnal Ilmu Hukum (Journal of Law)* 8, no. 1 (2021), <https://doi.org/10.22304/pjih.v8n1.a3>.

¹⁶ Rabbani, Khan, and Thalassinis, “FinTech, Blockchain and Islamic Finance: An Extensive Literature Review.”

advertising system.¹⁷ The absence of an underlying asset (underlying asset) which then allows extreme fluctuations in the Bitcoin exchange rate also contributes to the reason this transaction has an element of gharar. So, it can be said that the business of using Bitcoin is almost like betting. This is what is classified as the maysir element. Therefore, the haram law of using crypto money such as Bitcoin as a means of payment for investment and transactions in business is haram lighairihi because there are other factors outside of the substance.

Nevertheless, the discussion virtual money as a mean of payment from an Islamic perspective can begin with the benefits (*maslahah*)¹⁸. If there is no *maslahah*, it is not in line with Islamic principles. In general, technological advancement can increase transaction efficiency from various perspectives. The time required to complete transactions is more efficient. Cash transactions are more time-consuming because the cash must be counted along with the change. Some of its benefits as a means of payment include, CBDC does not require a bank account so that people do not need to open a paid account at a bank to be able to use CBDC. Because it is not required to open an account, there is no minimum deposit. The offline functionality of CBDC is possible. Particularly in remote regions, certain financially excluded communities depend on physical currency due to unreliable mobile or internet connectivity.¹⁹ Additionally, cash is crucial in nations susceptible to natural disasters and frequent network disruptions. CBDC, utilizing Radio Frequency Identification, Near Field Communication, or Bluetooth networking, has the capability to facilitate transactions in an entirely offline setting where data service availability is limited and mobile connectivity is prevalent. The development of offline payment functionality for CBDC that is safe, secure, and inexpensive is presently underway in order to mitigate the risks associated with money laundering, terrorism financing, and fraudulent activities. The development of a CBDC that provides numerous practical advantages and is gaining international recognition is inevitable; thus, it is critical to develop a sharia CBDC.

¹⁷ Soehartono and U. Khaerah Pati, "The Regulation of Cryptocurrency Investation in Indonesia," 2019, <https://doi.org/10.2991/icglow-19.2019.54>.

¹⁸ Tawfique Al-Mubarak and Noor Mohammad Osmani, "Applications of Maqasid Al-Shari?Ah and Maslahah in Islamic Banking Practices: An Analysis," *International Seminar on Islamic Finance in India*, 2010.

¹⁹ Brandon Tan, "Central Bank Digital Currency and Financial Inclusion," *IMF Working Papers* 2023, no. 069 (2023), <https://doi.org/10.5089/9798400238277.001>.

B. How to ensure the compatibility of Central Bank Digital Currency (CBDC) with the tenets of Islamic law

Basically, Islam views money only as a medium of exchange, not as commodities. Therefore, the demand motive for money is to meet the needs of transactions (money demand for transactions), not for speculation. Islam also strongly encourages the use of money in exchange, as in the hadith narrated by Ata bin Yasar, Abu Said and Abu Hurairah also Abu Said al-Khudri explained that it turned out that the Prophet SAW did not approve transactions with the barter system, for that it is recommended to use money. It seems that he forbade such an exchange because there was an element of usury in it. Money belongs to society so it is forbidden to hoard it under the pillow (unproductive), because it reduces the amount of money circulating in society. The Qur'an and hadith explain textually that dinars and dirhams were currencies used as a medium of exchange in the time of the Prophet, a measure of the value of stored wealth, not as a commodity. Written in the word of Allah SWT in QS. at-Tawbah [9]: 34, it is explained about those people in that era who liked to hoard gold and silver without alms or use in the way of Allah Almighty, then surely Allah will give a very painful punishment in the last day. From the explanation of this verse it can be concluded that gold and silver are treasures that can be stored and used as a symbol of one's wealth. So, gold and silver have functioned as a medium of exchange, store of value, unit of account and standard payment on future.²⁰

If we look at the first condition, namely the fulfillment of sil'ah (commodity) requirements shari'i, there are several elements that must be fulfilled. The first element of sil'ah is that there is a physical form, if we look at the Digital Rupiah White Paper issued by Bank Indonesia, there is an indication that CBDC is only available in digital form and does not represent physical form.²¹ This is similar to other digital money that is issued and disseminated to the public entirely using digital concepts and has no physical form.²² Nevertheless, digital money such as CBDC is actually capable of offering digital tokens or electronic records of state money issued by the Government.²³ Then the second element of sil'ah has value, while the Digital Rupiah which will become the CBDC of the State of Indonesia will later have a position as a

²⁰ Adiwarman A Karim. Bank Islam-Analisis Fiqih dan Keuafngan, Edisi Ketiga. (Jakarta: PT Raja Grafindo Persada, 2007) Hlm 117.

²¹ Bank Indonesia, Op.cit. hlm. 12.

²² Wardoyo dan Hapsari, "Cryptocurrency Assetsas Physical Collateral in Indonesia", Legality: Jurnal Ilmiah Hukum Vol. 31 No. 1, Maret 2023, hlm. 65.

²³ Alfar dkk, "The determinants of issuing central bank digital currencies", Research in International Business and Finance Vol. 64, January 2023, hlm. 4.

medium of exchange and store of value which is one of the new pillars of the monetary system in Indonesia, so that the Indonesian CBDC meets the second element.²⁴ The third element of sil'ah, namely knowing the exact amount, Bank Indonesia as the central bank that determines monetary policy in Indonesia certainly has the full right to control the amount of digital money in circulation, so that the circulation of digital money can be controlled by Bank Indonesia and has fulfilled the third element.²⁵ The last element of sil'ah, namely having property rights and can be handed over to buyers, has actually been included in the concept of CBDC in Indonesia which later Digital Rupiah will have access rights which is a step for the community to have it to be used according to their individual needs.²⁶

On the other hand, for the fulfillment of sil'ah elements, CBDC must also ensure that there are no elements of *gharar*, *dharar*, and *qimar* in it. If we look at the CBDC launched and controlled by Bank Indonesia, then the *gharar* element regarding the uncertainty regarding the objects that can be handed over to buyers becomes non-existent, because Bank Indonesia is the central bank that has monetary policy to be able to issue legal money for sale and control financial turnover in Indonesia.²⁷ In addition, the *dharar* element regarding transactions capable of causing losses can also be eliminated when Bank Indonesia launches the Digital Rupiah as Indonesia's CBDC, because Bank Indonesia has full power in maintaining state financial stability and the Digital Rupiah is designed to mitigate these risks.²⁸ Finally, the *Qimar* or *Masyir* element regarding transactions with one loss and one profit system will also not be found in the Indonesian CBDC, because the true purpose of Bank Indonesia issuing and continuing to control the turnover of CBDC in Indonesia is as a legal means of buying and selling transactions and is not intended to benefit one party by harming the other party.²⁹ Thus, it can be concluded that the CBDC to be launched while remaining controlled by Bank Indonesia can be applied to Islamic banking because Digital Rupiah as a CBDC in Indonesia is able to avoid elements that prohibit the occurrence of a transaction.

²⁴ Bank Indonesia, Op.cit. hlm. 18.

²⁵ Buldas dkk, "Secure and Efficient Implementation of Electronic Money" (Hybrid Gold Open Access: Ho Chi Minh, 2022), hlm. 34.

²⁶ Bank Indonesia, Op.cit. hlm. 21-22.

²⁷ Niki Fitriyani, Skripsi: "ANALISIS DAMPAK PERKEMBANGAN MATA UANG DIGITAL BITCOIN DALAM PEREKONOMIAN (Studi Terhadap Keberadaan Unsur Gharar)" (Banda Aceh: UIN Ar-Raniry, 2020), hlm. 21-23.

²⁸ Bank Indonesia, Op. Cit. hlm. 33-35.

²⁹ Bank Indonesia, Op. Cit. hlm. 18.

The Quran and Hadith do not explain the meaning of currency or money itself. On the other hand, according to Dr. Daud Abu Bakr in one of his articles on Bitcoin, it is mentioned that Islam since the time of the Prophet (PBUH) has never given a definite and firm definition of what is meant by currency. This is because currency is part of the human social structure. Since Allah and the Prophet Himself did not give any requirements for the characteristics of money, one should look at the views and definitions given by Islamic jurists. Currency or money in the perspective of Sharia has long been defined by a number of scholars. Imam al-Ghazali, a classical jurist considered that currency should have a function as a medium of exchange as well as a measure of value. While Ibn Taymiyyah also emphasized on the measure of value by saying whenever a currency is sold to each other on a deferred basis, it is contrary to the *Thamaniyyah* (measure of value) purpose of money. In modern *muamalah* activities, both carried out by financial institutions and those that occur in society, the practice of *gharar* and *qimar* also often occurs.³⁰

The existence of Central Bank Digital Currency (CBDC) as an innovation and technological development that uses the Blockchain system has many positive impacts such as ease and speed in making transactions, cheaper and more confidential and can be used across countries and across continents. In the teachings of Islam, in discussing the *muamalah* aspect, it recognizes the rules of jurisprudence, "basically every *muamalah* activity is permissible until there is a reason that prohibits it".³¹

The practicality, efficiency and security of payment instruments can be achieved through CBDC. In short, CBDC is a direct central bank obligation in the form of digital currency.³² Its technology enables CBDCs to improve interoperability between central banks, payment service providers, and other financial institutions to regulate digital payments.³³ Furthermore, CBDC is also able to have a significant positive impact on macroeconomics such as reducing inflation and encouraging economic growth.

However, given the nature of CBDCs, some Islamic principles can be violated if not applied carefully. Although CBDCs are fundamentally different from

³⁰ Triyuwono, I. (2023). Central Bank Digital Currency in Sharia Economic Perspective: Central Bank Digital Currency dalam Perspektif Ekonomi Syariah. *Reviu Akuntansi, Keuangan, dan Sistem Informasi*, Vol 2, No. 1. Hlm 224.

³¹ Ibid.

³² Prayudya, D. R., & Al-Ayubi, S. (2023). Islamic Central Bank Digital Currency (CBDC) Design. *Al-Infaq: Jurnal Ekonomi Islam*. Jilid 14, No. 1. Hlm 142.

³³ Morales-Resendiz, R., Ponce, J., Picardo, P., Velasco, A., Chen, B., Sanz, L., Guiborg, G., Segendorff, B., Vasquez, JL, Arroyo, J. , Aguirre, I., Haynes, N., Panton, N., Griffiths, M., Pieterz, C., & Hodge, A. (2021). Implementing a retail CBDC: Lessons learned and key insights. *Latin American Journal of Central Banking*, Vol. 2, No.1.

cryptocurrencies, they have some similarities in their technology. For example, anonymity can violate the principles of ushul fiqh and Ibn Majah hadith number 2340 on transparency in avoiding illicit activities such as money laundering. Therefore, CBDCs are associated with some complicated design issues with Islamic principles such as how CBDCs should be remunerated and how CBDCs should be treated in tokenized financial markets. However, according to Firdiansyah & Samsuri's research, CBDC implementation will provide more benefits than masdafah because it removes some haram elements from cryptocurrencies.³⁴

Introducing CBDCs to the public can be attributed to commodities like gold. It must be remembered that it should not be carried out with the aim of generating interest. In addition, CBDC is implemented by eliminating agency fees and moral hazard in transaction costs to be in line with Islamic principles. Blockchain and other Distributed Ledger Technology (DLT)-based technologies can serve CBDCs with Islamic principles by helping to apply Islamic maqashid principles in controlling their optimization. In addition, as long as the CBDC does not carry maysir, usury, and vulnerability to illicit activities, it will be accepted as a permissible instrument.³⁵

In proposing an optimal CBDC design that follows Islamic principles, there are several design options from the relevant literature.³⁶ First, the implementation of linkage design in retail and wholesale. Since CBDCs aim to improve society, wider coverage must be achieved. Retail linkages allow central banks to encourage financial inclusion due to accessibility to households and businesses. In addition, it also offers new ways to transform the unbanked into the unbanked, thereby increasing their level of competition and diversity in the global marketplace. An inclusive financial ecosystem that can lower transaction costs, remove financing barriers, and increase the power of microfinance can also be achieved through retail CBDCs. At the same time, retail CBDCs help unbanked and unbanked individuals to have a digital identity. This allows people to have a track record of financing and makes it easier for them when they want to apply for financing. Turning to wholesale interlinkage, the technology is also designed to reduce settlement risk and increase the efficiency of large-value financial transactions or so-called wholesale transactions.

³⁴ Firdiansyah, FA, & Samsuri, A. (2021). THE URGENCY OF CENTRAL BANK DIGITAL CURRENCY (CBDC) IMPLEMENTATION; MAQĀSHĪD SYARĪ'AH PERSPECTIVE. *An-Nisbah: Jurnal Ekonomi Syariah*, Vol. 8, No. 2.

³⁵ Firdiansyah FA, & Samsuri. Op.cit.

³⁶ Auer, R., Banka, H., Boayke-Adjei, N., Faragallah, A., Frost, J., Natarajan, H., & Prenio, J. (2022). *Central bank digital currencies: a new tool in the financial inclusion toolkit?* (No. 41; FSI Insights)

Second, the account and token payment authenticators must be deployed simultaneously. Technically, both technologies can be implemented as illustrated by Bitcoin. Authenticating accounts allows identifying each CBDC user. For this reason, the central bank can prevent all illicit activities such as corruption, money laundering, terrorism financing, illicit transactions, and tax evasion. At the same time, following, token authenticators refer to designs where a CBDC has one or more cash-like features such as representing bearer instruments and supporting offline or anonymous payments. This is important because CBDCs represent national official tender that must be accessible in any circumstances such as power outages. However, communication lines such as satellites for banking need to be further developed to reduce the digital divide, so that CBDC implementation can be fully optimized.³⁷

Third, switch to a hybrid architecture for Islamic CBDCs. This architecture implies that CBDCs are claims against the central bank, the intermediary that handles and handles retail payments, while the central bank also records retail balances periodically. Hybrid CBDCs have advantages and disadvantages over indirect or direct CBDC architectures. As an intermediate solution, it may offer better resilience than indirect CBDCs. The central bank keeps a copy of all retail CBDC holdings, thus allowing it to transfer ownership from one payment service provider to another in the event of a technical failure. However, this will add complexity to the central bank's operations. On the other hand, hybrid CBDCs are still simpler to operate than direct CBDCs. Since central banks do not interact directly with retail users, they can concentrate on a number of core processes, while intermediaries handle other services including instant payment confirmation. Furthermore, hybrid architecture is also in line with one of the *maqasid* sharia elements, namely *hidzfu maal*. Compared to other architectures, hybrid architectures offer better resilience. In addition, its simplicity allows central banks to concentrate on specific issues, such as cybersecurity and illicit activity in a transaction. Again, this is in line with Ibn Majah's Hadith: 2340 that we, in this context, central banks must provide solutions to mitigate cyber-attacks and all illicit activities such as money laundering, terrorism financing, and so on.

C. How to Design the System that Supports Bank Sariah Liquidity Amid the Use of CBDC

CBDC serves as a digital manifestation of a nation's currency, and it must fulfill three fundamental roles of money: acting as a means to store value, facilitating transactions

³⁷ Prayudya, D., & Firmansyah, F. (2022). Analysis of Communication Satellite Utilization Indonesian Banking. *Economics Development Analysis Journal*. Vol. 11, No.1.

as a medium of exchange, and serving as a standard unit for measuring value. Currently, the ongoing pilot programs for Central Bank Digital Currencies (CBDCs), which include both retail and wholesale segments, are primarily focused on the conventional system. CBDC that effectively performs the three fundamental tasks without offering any kind of compensation or interest is deemed permissible for sharia-compliant transactions. Nevertheless, the implementation of retail Central Bank Digital Currency (CBDC) must be accompanied by a robust framework that guarantees adherence to Sharia principles. There is a need for the implementation of new monetary policy tools, interbank and capital market systems that comply with shariah principles in order to ensure that transactions or projects conducted are in accordance with Islamic law.

The opportunity for the creation of sharia digital money can reflect on the world digital financial system, which on September 1, 2023 launched a new digital money by carrying out the concept of fusion between the digital financial system and Islamic economic principles, namely Islamic Coin (\$ISLM).³⁸ ISLM Coin is an authentic digital asset that adheres to the principles of Shariah, thereby serving as a link between contemporary finance and ethical financial conduct. It functions on a profit-and-loss share framework, thereby conforming to the Islamic finance prohibition on interest-based lending. Each transaction that occurs on the HAQQ (the blockchain network that issues the native cryptocurrency, Islamic Coin) is being scrupulously recorded on a decentralized ledger, blockchain ensures compliance and transparency. To ensure ethical relevance for Muslim users, HAQQ Wallet incorporates Oracle Shariah mechanisms.³⁹ This mechanism controls which smart contracts can interact with the HAQQ Wallet, verifying its ethical compliance. It along with community oversight and Sharia Board approval, ensures that only sharia-compliant smart contracts are whitelisted in the HAQQ Wallet. The Sharia Council is one of the boards of the HAQQ Network and Islamic Coin. Oracle Syariah serves as an on-chain Halal Certificate registration that gives smart contract developers and web2 businesses a way to prove their ethical relevance to Muslim users by listing their products/services on the Haqq Wallet. Integrating Oracle Syariah with Haqq Wallet will ensure that users only interact with whitelisted and Sharia-compliant dApps. So, in addition to being a place where anyone can implement their dApp or project, Oracle Shariah network is a major step to minimize unethical or Haram activities on the network. This feature benefits

³⁸ Mentari Puspadini, “Kripto ‘Syariah’ Pertama di Dunia Muncul, Ini Tokoh Kuncinya” (<https://www.cnbcindonesia.com/market/20230731154223-17-458806/kripto-syariah-pertama-di-dunia-muncul-ini-tokoh-kuncinya>, diakses pada 20 Desember 2023 pukul 22.37).

³⁹ <https://islamiccoin.net/id> accessed on October 02th, 2023

HAQQ ecosystem investors and users by providing a transparent, secure, and Shariah-compliant environment for investment. It also helps to mitigate common front-end attacks, making it harder for hackers to hijack smart contracts and manipulate data. For instance, if a user tries to interact with a non-whitelisted contract on the Shariah Oracle level, the user gets a warning message. The Shariah Oracle will be implemented on top of the Layer 1 governance and has two levels of approval: Community approval and Shariah board approval.

The Islamic Coin (\$ISLM) system, namely cryptocurrency that guarantees the fulfillment of sharia principles, can be used as a frame of reference for designing CBDC. However, because CBDC is a virtual currency that is managed centrally, supervision only exists with Indonesian banks. So that approval only exists in broad shariah which in Indonesia is called the national sharia council of the Indonesian ulema council (DSN MUI). Wallets for sharia CBDCs must be integrated with systems that ensure sharia compliance alike oracle shariah that controls which smart contracts verifying the ethical compliance. Sharia Oracle is a mechanism that ensures that all transactions and projects built on the Haqq Network are projects that comply with Islamic finance principles. all participants in the network will be involved to ensure that the Haqq Network and Islamic Coin ecosystems are halal.

The verification process carried out by this system requires developers or project founders to upload governance proposals. This proposal will go up again to Sharia Board to be re-examined for the suitability of the project and its team to Islamic finance principles. If approved, the smart contract can move on the Haqq Network and interact with Islamic Coin.

The Verification System that guarantees the use of CBDC for halal transactions will answer the liquidity problems of Islamic banks. The current CBDC pilot project, which includes both the retail and wholesale sectors, is only focused on the conventional banking system. Meanwhile, in the Islamic financial system, CBDC that is given remuneration or interest is not permitted. Therefore, the central bank, as the issuer of CBDCs, must be able to design a digital currency that incorporates a profit-sharing mechanism. If the new system is not established soon, Islamic financial markets will experience increased risk that if deposits are used to fund CBDCs, then the central bank's ability to mitigate liquidity risks could be limited. In addition, Islamic banks cannot access interest-bearing liquidity services available at conventional banks. If the liquidity management mechanism can be designed in a shariah like manner as conventional – the interbank market, secondary market financial instruments, central bank discount windows and Lenders of Last Resort (LOLR) – based on the principle

of profit sharing.⁴⁰ Can be a means of liquidation of Islamic banks and investment of CBDC holders for the turnover of CBDC transacted sharia-compliant.

IV. CONCLUSION

From a Shariah standpoint, money should function as an equitable medium of exchange and should not be employed for speculative purposes. Bitcoin and Cryptocurrency, despite their revolutionary technology, carry significant hazards and have the ability to facilitate unlawful activities such as usury, maysir, and gharar. CBDC creation can align with Islamic principles by prioritizing transparency, fairness, and adherence to sharia law. However, it must also address intricate design challenges. In order to ensure the survival of Islamic banks and mitigate liquidity risks arising from the adoption of Central Bank Digital Currency (CBDC), it is imperative to establish a liquidity management mechanism rooted in sharia principles that incorporates the use of CBDC. The design incorporates the integration of e-wallets with a two-step verification method, involving both user and sharia boards. This system ensures that transactions utilizing Central Bank Digital Currency (CBDC) adhere to the norms of Sharia, as established by Islamic Coin using HAQQ Wallet and Oracle Shariah.

REFERENCES

- Adiwarman A Karim. Bank Islam-Analisis Fiqih dan Keuangan, Edisi Ketiga. (Jakarta: PT Raja Grafindo Persada, 2007) Hlm 117.
- Alam, S. Jamil, M. Syamsir, A. (2022). Digital Currency in Indonesia (Prospects and Challenges in Inclusive Financial Reviews). *Jurnal Administrare: Jurnal Pemikiran Ilmiah dan Pendidikan Administrasi Perkantoran* Vol 9, hlm 515-428
- Aleksi Grym, et.al (2017). Central Bank Digital Currency, BoF Economic Review, Bank of Finland, 2017. h2.
- Al-Ayubi, S., & Halawatuddu'a, S. (2021). Maqasid Al-Sharia in Islamic Finance. *Jurnal Al-Dustur*. Vol, 4, No. 2.
- Al-Mubarak, Tawfique, and Noor Mohammad Osmani. "Applications of Maqasid Al-Shari'ah and Maslahah in Islamic Banking Practices: An Analysis." *International Seminar on Islamic Finance in India*, 2010.
- Alnemer, Hashem Abdullah. "Determinants of Digital Banking Adoption in the Kingdom of Saudi Arabia: A Technology Acceptance Model Approach." *Digital*

⁴⁰ Lukonga, "Monetary Policy Implications of Central Bank Digital Currencies: Perspectives on Jurisdictions with Conventional and Islamic Banking Systems."

- Business* 2, no. 2 (2022). <https://doi.org/10.1016/j.digbus.2022.100037>.
- Auer, R., Banka, H., Boayke-Adjei, N., Faragallah, A., Frost, J., Natarajan, H., & Prenio, J. (2022). *Central bank digital currencies: a new tool in the financial inclusion toolkit?* (No. 41; FSI Insights).
- Ausop, Asep Zaenal & Elsa Silvia Nur Aulia. (2018). Teknologi Cryptocurrency Bitcoin Untuk Investasi Dan Transaksi Bisnis Menurut Syariat Islam. *Jurnal Sosioteknologi*, 17(2), 74-92. <https://doi.org/10.5614/sostek.itbj.2018.17.1.8>
- Boiko, Viktor. "CENTRAL BANKS DIGITAL CURRENCIES AND PROSPECTS FOR THE UKRAINIAN ECONOMY." *Economics & Education* 6, no. 2 (2021). <https://doi.org/10.30525/2500-946x/2021-2-13>.
- Bhiantara, I. B. P. (2018). Teknologi Blockchain Cryptocurrency Di Era Revolusi Digital. *Prosiding Seminar Nasional Pendidikan Teknik Informatika (SENAPATI), IX*, 173-178. <https://www.scribd.com/document/506429892/1204-61-1753-1-10-20180914-1>
- Çağlayan, Gökhan, Bilgehan Kürşad Öz, Aleaddin Özer, and Emrah Şener. "Distributed Ledger Technology Experiments in Retail Payments: Evidence from Turkey Received (in Revised Form): 27th January, 2023." *Journal of Payments Strategy and Systems* 17, no. 2 (2023).
- Cretien, P.D. (2018), "Cryptocurrencies: price and pairs trading", *Techniques and Tactics*, Vol. 543, pp. 70-73.
- Dedi, Syarial, „Ekonomi Dan Penguasa (Pemikiran Ibn Taimiyah Tentang Mekanisme Pasar)“, *AL-FALAH : Journal of Islamic Economics*, 3.1 (2018), 73
- Fatwa Dewan Syariah Nasional-Majelis Ulama Indonesia No:82/DSN-MUI/VII/2011, Tentang Perdagangan Komoditi Berdasarkan Prinsip Syariah di Bursa Komoditi.
- Firdiansyah, FA, & Samsuri, A. (2021). THE URGENCY OF CENTRAL BANK DIGITAL CURRENCY (CBDC) IMPLEMENTATION; MAQĀSHĪD SYARĪ'AH PERSPECTIVE. *An-Nisbah: Jurnal Ekonomi Syariah*, Vol. 8, No. 2
- Hamin, D. I. (2020). Crypto Currensi Dan Pandangan Legalitas Menurut Islam: Sebuah Literature Review. *Jurnal Ilmiah Manajemen Dan Bisnis*, 3(2), 127-139. <https://doi.org/10.37479/jimb.v3i2.9430>
- Ibnu Qudamah, Al-Mughni, Jil. 6, (Kairo: Dâr al-H}adīts, 2004), 468.
- Jalil, A., & Abdillah, H. (2023). Hukum Cryptocurrency sebagai Mata Uang dan sebagai Komoditas (Analisis Fatwa MUI tentang Hukum Cryptocurrency). *Jurnal ilmiah ekonomi islam*, 9(03), 4245-4255. doi: <http://dx.doi.org/10.29040/jiei.v9i3.10269>
- Lukonga, Inutu. "Monetary Policy Implications of Central Bank Digital Currencies: Perspectives on Jurisdictions with Conventional and Islamic Banking Systems." *IMF Working Papers* 2023, no. 060 (2023). <https://doi.org/10.5089/9798400236532.001>.

- Morales-Resendiz, R., Ponce, J., Picardo, P., Velasco, A., Chen, B., Sanz, L., Guiborg, G., Segendorff, B., Vasquez, JL, Arroyo, J. , Aguirre, I., Haynes, N., Panton, N., Griffiths, M., Pieterz, C., & Hodge, A. (2021). Implementing a retail CBDC: Lessons learned and key insights. *Latin American Journal of Central Banking*, Vol. 2, No.1.
- Pati, Umi, Pujiyono Pujiyono, and Pranoto Pranoto. "Sharia Fintech as a Sharia Compliance Solution in the Optimization of Electronic-Based Mosque's Ziswaf Management." *PADJADJARAN Jurnal Ilmu Hukum (Journal of Law)* 8, no. 1 (2021). <https://doi.org/10.22304/pjih.v8n1.a3>.
- Prayudya, D., & Firmansyah, F. (2022). Analysis of Communication Satellite Utilization Indonesian Banking. *Economics Development Analysis Journal*. Vol. 11, No.1.
- Prayudya, D. R., & Al-Ayubi, S. (2023). Islamic Central Bank Digital Currency (CBDC) Design. *Al-Infaq: Jurnal Ekonomi Islam*.
- PT. Bursa Komoditi dan Derivatif Indonesia, Sekilas Mengenai ICDX: Peluang Investasi di Perdagangan Berjangka Komoditi, (Jakarta: PT.BKDI/ICDX, 2013), 20.
- Rabbani, Mustafa Raza, Shahnawaz Khan, and Eleftherios I. Thalassinou. "FinTech, Blockchain and Islamic Finance: An Extensive Literature Review." *International Journal of Economics and Business Administration* 8, no. 2 (2020). <https://doi.org/10.35808/ijeba/444>.
- Sallam, Mohammed. "The Role of the Saudi Central Bank in Promoting the Growth of the Electronic Payments Sector in the Kingdom of Saudi Arabia According to Vision 2030." *Journal of Umm Al-Qura University for Sharia'h Sciences and Islamic Studies*, no. 93 (2023). <https://doi.org/10.54940/si61013284>.
- Soehartono, and U. Khaerah Pati. "The Regulation of Cryptocurrency Investation in Indonesia," 2019. <https://doi.org/10.2991/icglow-19.2019.54>.
- Syarial Dedi, (2018), Ekonomi Dan Penguasa (Pemikiran Ibn Taimiyah Tentang Mekanisme Pasar)", *Al-Falah: Journal of Islamic Economics*, 3.1, 73
- Tan, Brandon. "Central Bank Digital Currency and Financial Inclusion." *IMF Working Papers* 2023, no. 069 (2023). <https://doi.org/10.5089/9798400238277.001>.
- Trabelsi, Nader, „Are There Any Volatility Spill-Over Effects among Cryptocurrencies and Widely Traded Asset Classes?“, *Journal of Risk and Financial Management*, 11.66 (2018)
- Triyuwono, I. (2023). Central Bank Digital Currency in Sharia Economic Perspective: Central Bank Digital Currency dalam Perspektif Ekonomi Syariah. *Reviu Akuntansi, Keuangan, dan Sistem Informasi*, Vol 2, No. 1.
- Zainul Arifin. (2002). *Dasar-Dasar Manajemen Bank Syariah*. Jakarta: AlvaBet Vol 98.