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INDONESIAN SMART SUKUK MODEL: OPPORTUNITIES AND CHALLENGES

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ABSTRACT

Micro, Small and Medium Enterprises (MSMEs) have long been the backbone of the Indonesian economy. Recent research shows that Sukuk can be a financing solution for MSMEs. However, the cost of Sukuk is higher than bonds in general, thus burdening MSMEs as issuers. The issue of issuance costs can be fixed through blockchain-based smart contract technology called smart Sukuk. This study aims to describe smart Sukuk's opportunities and the challenges it faces in its implementation in Indonesia. Several research has been done discussing Smart Sukuk and the general challenges of issuing Sukuk on the blockchain. This research focuses on the opportunities and challenges of issuing smart Sukuk and its implementation in Indonesia. The approach used in this study is a qualitative research method with a literature study. The findings show that several factors support the potential of smart Sukuk instruments in Indonesia, namely increased internet penetration, the Muslim population, an increase in young investors and a large number of MSMEs and their contribution to Indonesia's Gross Domestic Product. At the same time, the challenges in developing this evolutionary technology in Indonesia are the underlying regulations that have yet to be formed, unclear tax treatment, the tenor of Sukuk, liquidity risk, and cyber risk that are not evenly distributed.

ABSTRAK

Usaha Mikro, Kecil dan Menengah (UMKM) telah lama menjadi tulang punggung perekonomian Indonesia. Penelitian terbaru menunjukkan bahwa sukuk dapat menjadi solusi pembiayaan untuk UMKM. Namun, biaya penerbitan sukuk lebih tinggi dibandingkan obligasi, sehingga membebani UMKM sebagai penerbit. Masalah biaya penerbitan dapat diatasi melalui teknologi *smart contract* berbasis *blockchain* yang disebut smart sukuk. Penelitian ini bertujuan untuk mendeskripsikan peluang smart sukuk dan tantangan yang dihadapi dalam implementasinya di Indonesia. Pendekatan yang digunakan dalam penelitian ini adalah metode penelitian kualitatif dengan studi literatur. Temuan menunjukkan bahwa ada beberapa faktor yang mendukung potensi instrumen smart sukuk di Indonesia, yaitu peningkatan penetrasi internet, populasi umat Islam, peningkatan investor muda dan banyaknya UMKM serta kontribusinya terhadap Produk Domestik Bruto Indonesia. Sementara itu, tantangan dalam pengembangan teknologi evolusioner ini di Indonesia adalah regulasi dasar yang belum terbentuk, perlakuan perpajakan yang tidak jelas, tenor sukuk, risiko likuiditas, dan risiko *cyber* yang belum merata.

KataKunci: ***Smart Sukuk, Tokens, Blockchain, Smart Contracts, MSME***

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INTRODUCTION

Since the publication of the Bitcoin white paper in 2008, blockchain's popularity has continued to rise. Numerous startups, major technology companies, large banks, and even national governments have begun exploring the potential of this innovation[1]. Transparency, security, trust, and the ability to provide customized services make blockchain particularly well-suited to the financial sector[2]. It is not uncommon for blockchain technology to be regarded as the most significant disruptor to the financial system[3], so it is no surprise that the Organization of Islamic Cooperation (OIC) has also shown interest in this technology.

Many Islamic financial institutions plan to utilize the blockchain system to harness its associated benefits[4]. For instance, in 2018, Bank Al Hilal in the United Arab Emirates became the first Islamic bank globally to leverage blockchain for secondary market transactions on Bank Al Hilal Senior Sukuk worth USD 500 million, maturing in September 2023. In 2019, Dubai-based blockchain fintech Wethaq, in collaboration with blockchain firm R3, issued its first pilot Sukuk on a securities market platform for Islamic capital markets[5].

Indonesia, the world's largest Muslim-majority country, has also recognized the potential of this technology by issuing the world's first blockchain-based Sukuk, known as Smart Sukuk™. In October 2019, this Sukuk innovation was launched through an Indonesian sharia microfinance cooperative, Baitul Maal wat Tamwil Bina Ummah, under a mudharabah or profit-loss sharing scheme[6]. The issuance of Smart Sukuk raised IDR 710 million (USD 50,000) through the Smart Sukuk Blossom Finance platform[7].

Smart Sukuk marks a new starting point in the development of innovation and the niche Islamic capital market in Indonesia. Therefore, blockchain-based Sukuk has become a critical topic[8], considering its vast potential. However, since its initial issuance in 2019, followed by

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[1] Laura Grassi et al., "Do We Still Need Financial Intermediation? The Case of Decentralized Finance – DeFi," *Qualitative Research in Accounting and Management* 19, no. 3 (2022): 323–347; Elisabeta Pana and Vikas Gangal, "Blockchain Bond Issuance," *Journal of Applied Business and Economics* 23, no. 1 (2021): 217–226.

[2] Anjan V. Thakor, "Fintech and Banking: What Do We Know?," *Journal of Financial Intermediation* 41, no. July (2020).

[3] Andrea Delle Foglie et al., "The Impact of the Blockchain Technology on the Global Sukuk Industry: Smart Contracts and Asset Tokenisation," *Technology Analysis and Strategic Management* 0, no. 0 (2021): 1–15, https://doi.org/10.1080/09537325.2021.1939000.

[4] Hussein Elasrag, "Blockchains for Islamic Finance: Obstacles & Challenges.," *Munich Personal RePEc Archive*, no. 03 (2019): 1–39, https://mpra.ub.uni-muenchen.de/id/eprint/92676; Azlin Alisa Ahmad, "Blockchain Technology – Towards Complementing the Structuring of Sukuk: A Literature Review," *International Journal of Social Science and Human Research* 4, no. 5 (2021): 1068–1073.

[5] Delle Foglie et al., "The Impact of the Blockchain Technology on the Global Sukuk Industry: Smart Contracts and Asset Tokenisation"; Nurul Izzati Septiana and Hilda Sanjayawati, "Sukuk on Blockchain: Application, Advantages, and Challenges," *Jihbiz jurnal ekonomi keuangan dan perbankan syariah* 5, no. 2 (2021): 120–133.

[6] Muhammad Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah," *Kajian Kelompok Analis Syariah (Pusat Kebijakan Sektor Keuangan-Badan Kebijakan Fiskal)* (2020), https://fiskal.kemenkeu.go.id/files/berita-kajian/file/1641441201_kajian_smart_sukuk_revisi_2021.pdf?msclkid=40c2a6e4cf9611ec896c58bf4357c768.

[7] Septiana and Sanjayawati, "Sukuk on Blockchain: Application, Advantages, and Challenges."

[8] Bealkama Malika, "Sukuk Tokenization: Successful Experiences," *Journal of Studies in Economics and Management* 4, no. 1 (2021): 904–923, https://www.asjp.cerist.dz/en/article/155687.

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a second issuance in 2020, no companies or institutions in Indonesia had issued similar blockchain-based Sukuk by 2022. This situation is attributed to several factors, including the regulation and legalization of Smart Sukuk, which have yet to reach a resolution. Another factor is the legal status of blockchain technology, which remains controversial in Islamic jurisprudence[9]. The emergence of Smart Sukuk in the Islamic finance industry is urgently needed to enhance effectiveness, particularly in complex Sukuk operations.

Naturally, challenges are inherent in the implementation of new financial instruments (pilot projects); however, these challenges[10] can hinder the outcomes of Smart Sukuk. Identifying and understanding these challenges allow for the potential transferability from the current structure to an improved one[11].

This paper aims to describe the opportunities that Smart Sukuk presents and the challenges in its implementation in Indonesia. Literature examining the challenges of blockchain-based Sukuk has indeed existed before[12], as seen in the paper 'Tokenization of Sukuk: Ethereum Case Study.' This study highlights several significant challenges in issuing Sukuk and discusses their resolution through blockchain. Khan conducted a new case study on Sukuk tokenization by implementing smart contracts for Murabaha Sukuk on Ethereum. The challenges examined in this paper focus on the feasibility of blockchain technology as a Sukuk platform. Kunhibava examines blockchain challenges to Sukuk in general by categorizing them into three types: legalization, regulation, and sharia compliance[13]. Meanwhile, Iman and Arifin underscore the regulatory challenges[14]. According to them, the peculiarity of blockchain lies in its decentralization, yet it is fraught with regulatory issues. One of the main reasons regulators oversee capital markets is to ensure that investors are protected and that market activity is relatively and ethically controlled[15]. As a result, regulatory authority is critical to the success of these blockchain-Sukuk initiatives. Unlike other papers that examine the challenges of issuing Sukuk on blockchain in general, this paper focuses on the opportunities and challenges of issuing Smart Sukuk in Indonesia.

The findings of this paper are expected to be beneficial to the government, regulators, and researchers in implementing appropriate interventions to address the challenges of Smart Sukuk in Indonesia[16]. Additionally, this research is expected to enrich Islamic finance literature, particularly the application of Sukuk on blockchain.

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[9] Malika, "Sukuk Tokenization: Successful Experiences."

[10] J. S. Keshminder, Mohammad Syafiq Abdullah, and Marina Mardi, "Green Sukuk – Malaysia Surviving the Bumpy Road: Performance, Challenges and Reconciled Issuance Framework," *Qualitative Research in Financial Markets* 14, no. 1 (2022): 76–94.

[11] Syarifuddin Syarifuddin et al., "Acceleration and Strengthening of Sharia Financial Inclusion Through Merging Sharia Banking in Indonesia," *Jurnal Ekonomi dan Bisnis Islam (Journal of Islamic Economics and Business)* 7, no. 1 (2021): 130.

[12] Nida Khan et al., "Tokenization of Sukuk: Ethereum Case Study," *Global Finance Journal* 51, no. April (2022).

[13] "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review," *ISRA International Journal of Islamic Finance* 13, no. 1 (2021): 118–135.

[14] "The Advantages and Challenges of Implementing Sukuk Through Blockchain Technology," *An-Nisbah: Jurnal Ekonomi Syariah* 8, no. 2 (2021): 247–270.

[15] Abdurrahman Mansyur and Engku Muhammad Tajuddin bin Engku Ali, "The Adoption of Sharia Fintech Among Millenial in Indonesia: Moderating Effect of Islamic Financial Literacy on UTAUT 2," *International Journal of Academic Research in Business and Social Sciences* 12, no. 4 (2022).

[16] Keshminder, Abdullah, and Mardi, "Green Sukuk – Malaysia Surviving the Bumpy Road: Performance, Challenges and Reconciled Issuance Framework."

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Issues In The Issuance Of Traditional Sukuk

Since they were first issued, Sukuk has become a leading innovation in the Islamic financial and capital markets[17]. Sukuk or also known as sharia bonds, have filled the role as a viable source of funding for project financing, corporate general goal requirements, capital adequacy, state budget and fiscal requirements, as well as liquidity management purposes[18]. Sukuk has become an alternative to bonds, especially after the 2008 financial crisis[19] and experienced substantial growth[20] until the last decade [21]. However, with this role, it does not mean that this leading Sharia instrument does not have challenges.

The Sukuk market set a new record through its total issuance in 2020. The total distribution of sukuk in 2019 was around 19.84% or USD 145,702 billion to USD 174,641 billion in 2020[22]. However, this extraordinary development does not mean that this leading Sharia instrument does not have challenges. One of the main problems of sukuk is the complexity of the structure, which results in increasingly complex laws and increased issuance costs (issuance costs)[23]. In contrast to its counterpart, conventional protection is simpler and more compact. These weaknesses are why sharia protection remains a financing instrument only issued by the state and large entities[24].

Issuance costs are not new in Islamic bond instruments[25]. According to Khan, some of the most significant obstacles in increasing market acceptance of Sukuk are: First, the procedure for documenting the issuance of Sukuk is slower and less efficient than conventional bonds, resulting in higher costs[26]. Second, the assessment of Sharia scholars is very important for any procedure for structuring Sukuk, while the Sharia assessment also increases the cost of the system. Third, there needs to be more standardization like, the traditional bond market, which slows the regulatory process, increases costs, and limits market spread. Fourth, internationally recognized Sharia norms are necessary for diverse Sukuk organizations to deal with Sharia conflicts consistently. Fifth, different tax treatment compared to traditional bonds, credit rating requirements, and asset issues during the transaction period.

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[17] Sarah Iftikhar, "A Comparative Analysis Of Cost And Benefits Of Blockchain Based Smart Sukuk Vs. Traditional Sukuk" (Institute of Business Administration (IBA), 2018); Rubaiyat Ahsan Bhuiyan et al., "Comparative Analysis between Global Sukuk and Bond Indices: Value-at-Risk Approach," *Journal of Islamic Accounting and Business Research* 11, no. 6 (2020): 1245–1256; Seda Yildirim, Durmus Cagri Yildirim, and Pelin Diboglu, "Does Sukuk Market Development Promote Economic Growth ?," *PSU Research Review* 4, no. 3 (2020): 209–218.

[18] Yildirim, Yildirim, and Diboglu, "Does Sukuk Market Development Promote Economic Growth ?"

[19] Md Hamid Uddin et al., "Why Do Sukuks (Islamic Bonds) Need a Different Pricing Model?," *International Journal of Finance and Economics* 27, no. 2 (2022): 2210–2234.

[20] Blossom Finance, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain," last modified 2018, https://blossomfinance.com/posts/islamic-finance-upgraded-smarter-sukuk-using-blockchain.

[21] Mesut Dogan, Mustafa Kevser, and Elif Erer, *Islamic Finance and Recent Development* (Eylül, Ankara: Gazi Kitabevi Tic. Ltd. Şti., 2021).

[22] International Islamic Financial Market, *10 Years of Research: Sukuk Report, A Comprehensive Study of The Global Sukuk Market*, 2021.

[23] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."

[24] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review"; Iftikhar, "A Comparative Analysis Of Cost And Benefits Of Blockchain Based Smart Sukuk Vs. Traditional Sukuk."

[25] Elasrag, "Blockchains for Islamic Finance: Obstacles & Challenges."

[26] Khan et al., "Tokenization of Sukuk: Ethereum Case Study."

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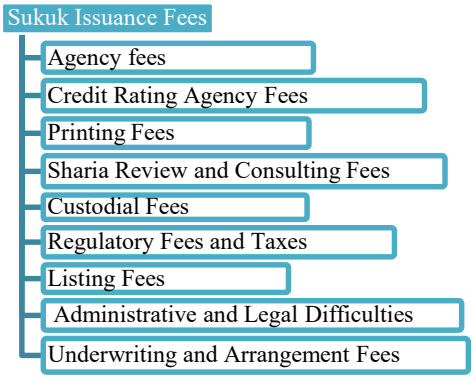
Figure1. Sukuk Issuance Fees



Source: List of costs in issuing sukuk[27]

With the significant growth in global sukuk issuance, there is a need for the introduction of new sukuk structures and contracts that are more efficient and capable of reaching other market segments[28]. If these challenges can be addressed, the potential of the sukuk market to expand the Islamic financial industry may continue to flourish[29]. Integrating Sukuk with blockchain-based smart contract technology is considered a solution to overcome these challenges. According to Zaka and Shaikh[30] and Ahmad[31], the implementation of blockchain technology innovation in Islamic financial instruments will assist Shariah bonds in remaining competitive with conventional products. Blockchain is recognized as a catalyst in decentralized finance (DeFi), referring to open, permissionless, and highly interoperable stack protocols built on public smart contract platforms, such as the Ethereum blockchain[32].

Adopting and implementing this new technology will help simplify issuing and trading sukuk and improve regulatory oversight[33]. This is possible because Ethereum smart contracts can assist in standardizing and automating legal fees, accounting, and payment of sukuk structures ((i) Identifying assets and structures; (ii) Negotiations (Syariah, Legal); and (iii) Document finalization[34]. Accepting and implementing this new technology will aid in streamlining the process of issuing and trading sukuk while elevating regulatory oversight to a more significant level. Thanks to Ethereum smart contracts, this can be realized. Smart contracts contribute to the standardization and automation of legal fees, accounting, and sukuk structure payments, encompassing (i) asset and structure identification; (ii) negotiations (Sharia and Legal); and (iii) document finalization[35].

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[27] Iftikhar, "A Comparative Analysis Of Cost And Benefits Of Blockchain Based Smart Sukuk Vs. Traditional Sukuk."

[28] Finance, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain."

[29] Yildirim, Yildirim, and Diboglu, "Does Sukuk Market Development Promote Economic Growth ?"

[30] *Blockchained Sukuk-Financing*, *Lecture Notes in Business Information Processing*, vol. 345 (Springer International Publishing, 2019), http://dx.doi.org/10.1007/978-3-030-19037-8_5.

[31] "Blockchain Technology – Towards Complementing the Structuring of Sukuk: A Literature Review."

[32] Fabian Schär, "Decentralized Finance: On Blockchain And Smart Contract-Based Financial Markets," *Federal Reserve Bank of St. Louis Review* 103, no. 2 (2021): 153–174.

[33] Syaakir Sofyan et al., "Evaluating Indonesian Islamic Financial Technology Scholarly Publications : A Bibliometric Analysis," *IKONOMIKA: Jurnal Ekonomi dan Bisnis Islam* 7, no. 2 (2022): 233–256.

[34] Osama Hamza, "Smart Sukuk Structure from Sharia Perspective and Financing Benefits: Proposed Application of Smart Sukuk through Blockchain Technology in Islamic Banks within Turkey," *EJIF – European Journal of Islamic Finance*, no. Second Special Issue (2020): 1–8.

[35] Hamza, "Smart Sukuk Structure from Sharia Perspective and Financing Benefits: Proposed

Blockchain-based sophisticated instruments will solve the problem of complexity and increase investor confidence through transparency. In Sukuk transactions, blockchain technology helps transparent transaction recording by indicating the source and time of payment. Therefore cash flows can be easily tracked, and corrective actions can be taken if needed[36]. More excellent information supply with increased transparency and traceability can impact investors' decision-making to own sukuk securities[37].

Table 1. Linking Criticism on the Demand Side of Sukuk and Smart Contract Benefits

Sukuk Criticism and Challenges (Demand Side)	**Benefits of Smart Contract (Demand Side)**					
	Self Execution	Automation	Tamper-proof (transparency and immutability)	Dependence on Intermediaries Institution	Cost Efficiency	Simple and Standardized
Slow Process	√	√		√	√	√
Sharia Compliance Assessment			√			√
Minimal Standardisation			√			√
Too Many Parties Involved			√	√	√	√
Takes Time	√	√			√	√
Transparency			√			√
Complexity			√			√
High-cost financing				√	√	√

Source: Criticism on the Demand Side of Sukuk and the Benefits of Smart Contracts[38]

With these advantages, an intelligent contract structure using blockchain technology will enable Micro, Small and Medium Enterprises (MSMEs), social impact projects, groups and associations to issue sukuk[39].

Indonesian Smart Sukuk

Blossom Finance's Smart Sukuk, which commenced operations in 2019, stands as a successful platform for blockchain-based Sukuk[40]. In accordance with Blossom Finance [41], the inception of Sukuk within the blockchain domain originated from the research conducted by Matthew Joseph Martin, the founder and CEO of Blossom Finance Indonesia. In his endeavor to create blockchain-based sukūk, Martin refers to this type of sukūk as SmartSukukTM, indicating the utilization of smart contracts for transactions. In May 2018, the company announced that the platform for issuing Smart Sukuk, an Islamic financing instrument supported by blockchain technology and based on Ethereum smart contracts, was ready for utilization.

Application of Smart Sukuk through Blockchain Technology in Islamic Banks within Turkey."

[36]Delle Foglie et al., "The Impact of the Blockchain Technology on the Global Sukuk Industry: Smart Contracts and Asset Tokenisation."

[37] Iftikhar, "A Comparative Analysis Of Cost And Benefits Of Blockchain Based Smart Sukuk Vs. Traditional Sukuk."

[38] Delle Foglie et al., (2021)

[39] Elasrag, "Blockchains for Islamic Finance: Obstacles & Challenges."

[40] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review"; Malika, "Sukuk Tokenization: Successful Experiences"; Blossom, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain," *Blossom Finance*, last modified 2017.

[41] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."

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Since the inaugural appearance of Smart Sukuk in 2019, this product has emerged as a leading tool in the Sukuk sector[42]. The success of Smart Sukuk issuance stems from the collaboration between Blossom Finance and Baitul Maal Bina Ummah Indonesia. Based on prior research by Imron et al.,[43], BMT Bina Ummah is legally registered as a Multi-Business Cooperative (KSU) and a Sharia Financial Services Cooperative (KJKS). BMT Bina Ummah incorporates various operational business models, involving Baitul Maal and Baitul Tamwil. Conversely, Blossom Finance, with its mission to enhance community welfare, particularly through Micro, Small, and Medium Enterprises (MSMEs), functions as the provider of the blockchain-based Smart Sukuk issuance platform, complemented by smart contracts known as Smart SukukTM.

Smart Sukuk BMT Bina Ummah issuance was first carried out in October 2019 with a value of IDR 715 million through a mudharabah contract for 12 months. The Smart Sukuk issued by BMT Bina Ummah managed to record an oversubscribed issuance. The Smart Sukuk issuance can finance 234 MSMEs with a margin (average) profit-sharing rate from the investment of around 15 per cent. The initial process of issuing Smart Sukuk took quite a long time as a pilot project. Before the contract issuance, Blossom Finance prepared several technical matters, such as adjusting the agreement form, reports and other administration[44].

Furthermore, Blossom Finance is an arranger and calculating agent in the Smart Sukuk issuance process. As a calculating agent, in setting prices and rates of return, Blossom Finance first compares the valuations and rates of return of several types of assets and financial products in several regions (domestic and international)[45]. Blossom Finance launched the second series of micro Smart Sukuk in 2020[46]. According to Blossom Finance[47], the main stakeholders in the capital market related to the issuance of Smart Sukuk consist of four institutions, namely: (i) KSPPS; (ii) investors; (iii) OJK; and (iv) Ministry of Finance.

Table 2. Smart Sukuk Stakeholders

Types	Stakeholder	Main Objective
Capital Raising	KSPPS	• Minimise cost of funds & seek cash flow-matched payments • Maintain good reputations & ratings
Capital Provider	Investor	• Maximizing returns & minimizing risks • Delegate oversight & protection of rights • Creating positive social impact
Regulator	OJK	• Facilitating efficient capital circulation • Protect investors from being unwise • Ensuring health & less systemic risk etc
Policy Maker	Kemenkeu	• Growing productive, competitive, inclusive, and fair in the 21st century

Source: Stakeholders in smart sukuk financial instruments[48]

[42] Market, *10 Years of Research: Sukuk Report, A Comprehensive Study of The Global Sukuk Market.*
[43] "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[44] Blossom, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain."
[45] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[46] Market, *10 Years of Research: Sukuk Report, A Comprehensive Study of The Global Sukuk Market.*
[47] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[48] Finance, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain."

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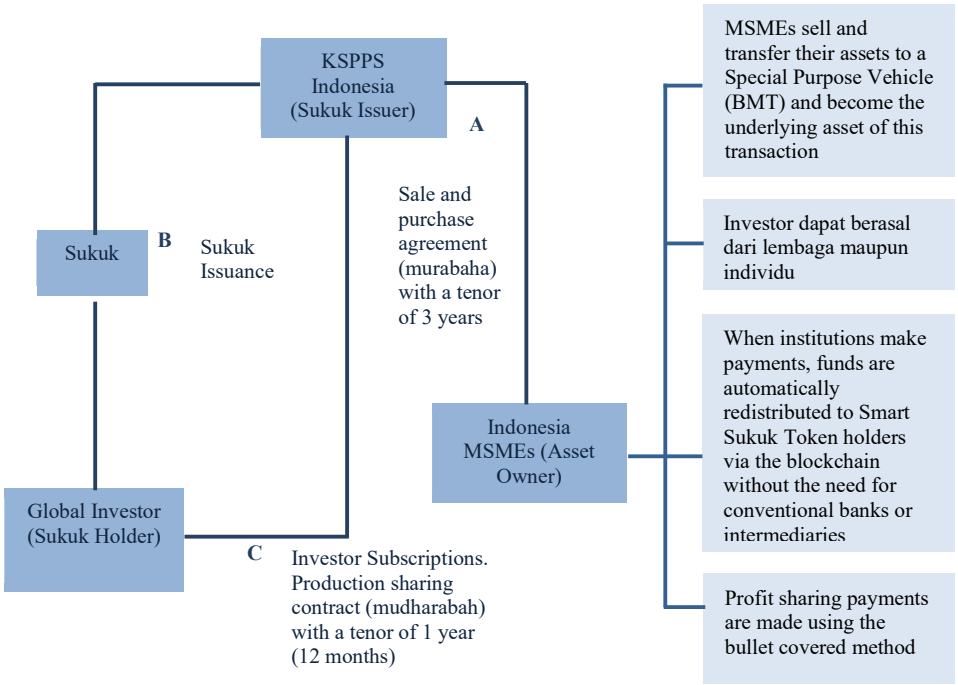
Blossom Finance and BMT Bina Ummah each have a Sharia Supervisory Board (DPS or Sharia advisor). As for in general, the issuance of sharia bonds or Sukuk, the basis for the issuance of Smart Sukuk is based on the Fatwa of the National Sharia Council of the Indonesian Ulema Council (DSN MUI) Number 32/DSN-MUI/IX/2002 concerning Sharia Bonds. Before issuing Smart Sukuk, BMT Bina Ummah consults with its DPS and establishes a mudharabah (profit sharing) contract (agreement) between Bina Ummah and the Sukuk buyer with a one-year term. Meanwhile, Bina Ummah, as KSPPS and MSMEs, uses a murabahah (buy and sell) contract for a longer period of three years. The investors in the Smart Sukuk issuance come from abroad and are single investors (private placement)[49].

Blossom Finance's Smart Sukuk mobilizes and attracts investment funds from investors by leveraging the Smart Sukuk token, symbolizing undivided ownership of sukūk assets[50]. Following the completion of payments, the funds are automatically distributed and allocated among various token holders through the blockchain, adhering to smart contract rules, thus reducing the necessity for intermediaries. The Smart Sukuk tokens are designed to be compatible with the ERC20 industry standard protocol based on the Ethereum smart contract. Through this standard, Smart Sukuk tokens can be exchanged and traded globally on public digital currency exchanges[51].

Figure 3. Smart Sukuk Scheme



Source: Smart sukuk scheme flow [52]

[49] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[50] Finance, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain"; Malika, "Sukuk Tokenization: Successful Experiences."
[51] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."
[52] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."

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In managing assets based on the results of a study by the Kementerian Keuangan[53], Blossom Finance accommodates investor ownership of assets (Sukuk) in the blockchain through (adopting) ERC20 Tokens, which can be used as (value) proof of ownership of Smart Sukuk. In addition, this Token also functions as a certificate of ownership with global standards so that it can be traded (opens secondary market opportunities) and recorded openly and transparently. All transactions (including payments owed to investors) can be seen in virtual data on Tokens which are also attached to smart contracts, as well as ledgers or records for parties who are system members. In addition, general information contained in the Token (ownership, trade, and performance of the Sukuk as well as personal information about investors and issuers of the Sukuk) is reported to the Indonesian Central Securities Depository (KSEI) as the central custodian.

The benefits obtained by Blossom Finance in issuing Smart Sukuk are taken from three fees, namely: (i) an underwriting fee at the time of issuance (raising funds) of 0.1 per cent to 0.3 per cent; (ii) platform fees or fees for using platforms in managing Sukuk assets of 0.2 per cent to 1 per cent; and (iii) carry of profit rate or a discount of 20 per cent of profits generated (investors)[54].

RESEARCH METHOD

This study adopts a qualitative approach using the literature review method. According to Septiana and Sanjayawati[55], literature analysis is highly useful for providing an in-depth understanding of specific issues or problems in research, identifying gaps in the existing literature, or discussing particular aspects of the topic under investigation. In this study, the literature review was conducted by examining various sources related to smart sukuk, including accredited scientific journals, books, and other research outputs such as journal articles, theses, and dissertations.

As primary references, the author utilized research findings from the Ministry of Finance and articles from Blossom Finance, a company collaborating with MSMEs. This study focuses on analyzing the challenges and opportunities of smart sukuk, particularly within the context of a case study in Indonesia. To analyze the data collected, this research employs a thematic analysis approach, which involves identifying, analyzing, and reporting patterns (themes) within the data. Thematic analysis enables the researcher to systematically organize and interpret information, thereby uncovering deeper meanings within the reviewed literature[56].

RESULTS AND DISCUSSIONS

Smart Sukuk Opportunities

As an innovator in Smart Sukuk issuance, Indonesia has emerged as a pioneer in implementing blockchain-based Sukuk instruments globally in the Islamic financial sector,

[53] "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[54] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[55] "Sukuk on Blockchain: Application, Advantages, and Challenges.".
[56] Lu'liyatul Mutmainah, Nurwahidin, and Nurul Huda, "Waqf Blockchain in Indonesia: At A Glance," *AL-AWQAF : Jurnal Wakaf Dan Ekonomi Islam* 14, no. 1 (2021): 31–49.

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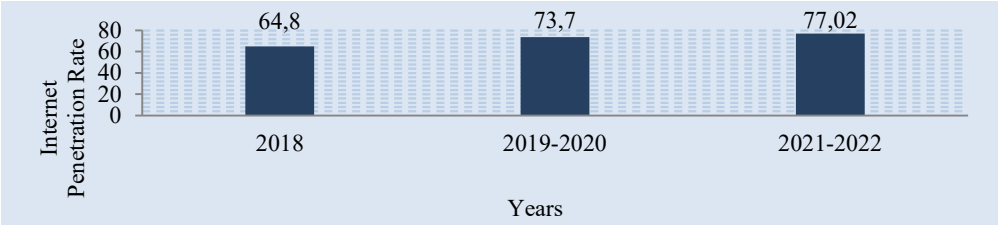
with the aim of enhancing Indonesia's role in supporting advancements in financial technology [57]Furthermore, the issuance of Smart Sukuk is also considered a groundbreaking step in the Islamic financial sector, as it provides inclusive economic opportunities for micro, small, and medium enterprises (MSMEs)[58]. As an innovation, these innovative Sukuk instruments offer various options that support the establishment of a fitting ecosystem.

Internet Penetration Percentage

Internet penetration is important for a country in the digitalization era. Based on a survey by the Association of Indonesian Internet Service Providers (APJII), the number of people connected to the Internet in 2021-2022 in Indonesia will be 210,026,769 out of a total population of 272 million Indonesians in 2021[59]. This total infected population can be an excellent opportunity for Indonesia's economic growth.

Lubis and Febrianty[60], said that until 2020 the number of consumers spending money to meet the demand for goods and services would increase significantly compared to spending money on basic needs, and technological developments will encourage them to make online transactions. This opinion has now become a fact supported by the results of a survey conducted by APJII. The findings show that 8.5% or as many as 10.4 million people access the Internet in Indonesia to do business[61]. In addition, the Financial Services Authority report noted that 88.1 per cent of internet users in Indonesia had used e-commerce services to purchase several products[62].

Figure 4. Internet Penetration Rate in Indonesia



Source: Indonesia's internet penetration rate[63]

Meanwhile, on the capital market side, in the midst of uncertain conditions due to the pandemic, there was an increase in the number of investors using the SOTS (Sharia Online Trading System), which reached 85,891 investors by the end of 2020, with a rise of 25.21% compared to the previous year[64]. This shows the great opportunity for Internet services to increase Indonesia's economic growth. Various survey results and increased internet

[57] Luthfia Ayu Karina, "Peluang Dan Tantangan Perkembangan Green Sukuk Di Indonesia," in *Conference On Islamic Management Accounting and Economics*, vol. 2, 2019, 259–265.

[58] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah.".

[59] Asosiasi Penyedia Jasa Internet Indonesia, *Profil Internet Indonesia 2022*, *Apji.or.Od* (Jakarta, 2022), apji.or.id.

[60] "Internet Influencing Economic Growth: What and How Much? A Case Study of Indonesia Using Time Series Data (2001-2016)," *SSRN Electronic Journal*, no. April (2018).

[61] Lubis and Febrianty, "Internet Influencing Economic Growth: What and How Much? A Case Study of Indonesia Using Time Series Data (2001-2016)."

[62] Novita Intan, "OJK: 88,1 Persen Pengguna Internet Belanja Pakai E-Commerce," *Republika Online*, last modified 2021, https://www.republika.co.id/berita/r2i9wt320/ojk-881-persen-pengguna-internet-belanjapakai-ecommerce.

[63] Indonesia, *Profil Internet Indonesia 2022*.

[64] Keuangan, *Laporan Perkembangan Keuangan Syariah Indonesia 2020*.

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penetration in Indonesia can also be an excellent potential for developing smart Sukuk in Indonesia.

Muslim Population

Based on research conducted by Mutmainnah et al [65] and Yildirim [66], a larger Sukuk market is associated with a more significant economic size a higher Muslim population in a country. Smaoui [67] suspects that the higher the percentage of Muslims in a country, the higher the demand for Islamic securities and, therefore, the faster the Sukuk market development. The findings show that the percentage of Muslims in a country positively affects the growth of the Sukuk market[68].

This statement is also supported by a study of the 10 most issuing countries of Sukuk (Saudi Arabia, UAE, Bahrain, Kuwait, Qatar, Malaysia, Indonesia, Brunei, Pakistan and Gambia), which was conducted to identify the influence of macroeconomic variables on the development of the Sukuk market. The study results show that the high percentage of Muslims in jurisdictions and governments who adopt the Sharia legal system has a significant positive impact on the development of the Sukuk market Said & Grassa dalam[69].

In this regard, Indonesia, a country with the largest Muslim population in the world, has great potential to develop the Sukuk market. The Muslim population in Indonesia continues to increase throughout the year tahun[70]. Based on data from the Central Statistics Agency (BPS), Indonesia had more than 260 million people in 2017[71]. Meanwhile, the Muslim population is 230 million people or around 85% of the total population of Indonesia[72]. Indonesia's population, which is predominantly Muslim, is a potential market for Sharia-compliant investment products[73]. This population can be added value or more factors when viewed from the investor side[74] and the issuing company (issuer).

Improvement of Young-adult Investors

Millennials have recently dominated Indonesia's productive age population[75], namely 69.38 million people, followed by Generation X of, 58.65 million or 21.88%[76]. Even though

[65] Lu'liyatul Mutmainah, Nurwahidin, and Nurul Huda, "Waqf Blockchain in Indonesia: At A Glance," *AL-AWQAF : Jurnal Wakaf Dan Ekonomi Islam* 14, no. 1 (2021): 31–49.

[66] Yildirim, Yildirim, and Diboglu, "Does Sukuk Market Development Promote Economic Growth ?"; Mutmainah, Nurwahidin, and Huda, "Waqf Blockchain in Indonesia: At A Glance."

[67] Houcem Smaoui and Mohsin Khawaja, "The Determinants of Sukuk Market Development," *Emerging Markets Finance and Trade* 53, no. 7 (2017): 1501–1518.

[68] Smaoui and Khawaja, "The Determinants of Sukuk Market Development."

[69] Iftikhar, "A Comparative Analysis Of Cost And Benefits Of Blockchain Based Smart Sukuk Vs. Traditional Sukuk."

[70] Mutmainah, Nurwahidin, and Huda, "Waqf Blockchain in Indonesia: At A Glance."

[71] Nur Rizqi Febriandika et al., "Customer E-Loyalty of Muslim Millennials in Indonesia: Integrated Model of Trust, User Experience and Branding in E-Commerce Webstore," *ACM International Conference Proceeding Series* (2020): 369–376.

[72] Karina, "Peluang Dan Tantangan Perkembangan Green Sukuk Di Indonesia."

[73] Muchtar, "Opportunities and Challenges of Retail Sovereign Sukuk Issuance: Lessons from Twelve Years' Experience."

[74] Karina, "Peluang Dan Tantangan Perkembangan Green Sukuk Di Indonesia."

[75] Subiakto Soekarno and Shirley Pranoto, "Influence of Financial Literacy on the Stock Market Participation and Financial Behavior among Indonesian Millennials," *International Symposia in EConomic Theory and Econometrics* 27 (2020): 115–125.

[76] Martha Riawan, Tri Widagdo, and Putri Enjelikal Falah, "The Influence of Millennial Investors on IHSG Movements In Jakarta Indonesia," *Humanities,Management and Science* 2, no. 1 (2021): 661–670.

financial literacy is one of the inhibiting factors for investment growth in Indonesia, the number of young investors is still increasing.

According to[77], the number of Single Investor Identification recorded at the Depository and Settlement Institution (KSEI) as of December 2018 totalled 1,617,367 people. This number increased by 44% from 1,122,668 people last year[78] added that 44% of all SID holders are millennials. In line with this, Riawan et al[79] stated in their paper that throughout 2020, the number of young investors aged 21-30 accounted for 57.02% of all investors, up from around 53% the previous year. This increase is a new opportunity for the Islamic financial market, especially in the implementation of smart Sukuk, where the adoption of the latest technology tends to be easier for young investors. Blockchain-based smart contracts as a fintech breakthrough are expected to be one of the driving factors for the millennial generation to invest in this instrument.

Number of MSMEs and Contribution to GDP

In developing countries, micro, small and medium enterprises (MSMEs) play an essential role as a source of income, employment, skills development and delivery of goods and services [80]. MSMEs in Indonesia contribute to the Gross Domestic Product (GDP) of IDR 8,573.89 trillion or around 61.07% and absorb 97% of the workforce or approximately 116,978,631 people. Indonesian MSMEs are 64,194,057 units or 99.99% of all business units [81]. However, based on data from the Asosiasi Fintech Pendanaan Bersama Indonesia[82], most domestic MSMEs still do not have access to credit. The level of financial inclusion of MSMEs in Indonesia has only reached around 30%, with 76.1% getting access to funding through banks and 23.9% getting access to funding through non-bank financial institutions (Bank Indonesia in[83]). The World Bank also explained the same thing. Based on[84]., the percentage of Indonesia's domestic credit to the private sector in 2020 will still be 38.7%.

Over the past decade, Indonesia has not exceeded the 40% threshold in this indicator[85]. The higher this figure, the greater the availability of financial resources or financing for the private sector in a country, thereby increasing the opportunities and space for the growth of the private sector. The better the role and contribution of the private sector in the national economy[86] , the greater the improvement in the overall well-being and economic

[77] Soekarno and Pranoto, "Influence of Financial Literacy on the Stock Market Participation and Financial Behavior among Indonesian Millennials."

[78] Soekarno & Pranoto, (2020)

[79] "The Influence of Millennial Investors on IHSG Movements In Jakarta Indonesia."

[80] Nafizha Trie Permata Sari and Andriani Kusumawati, "Literature Review : The Efforts To Strengthening of Micro, Small and Medium-Sized Enterprises (MSME) in Indonesia," *Asian Journal of Management, Entrepreneurship and Social Science* 2, no. 01 SE-Articles (2022): 98–115, https://ajmesc.com/index.php/ajmesc/article/view/52.

[81] Dailysocial.id, *MSME Empowerment Report 2021: Revive and Thrive with Digitalization*, 2021.

[82] "Bagaimana Fintech Pendanaan Bersama Bisa Membuat UMKM Indonesia Lebih Berkembang?," last modified 2021, https://www.afpi.or.id/articles/detail/umkm-indonesia-lebih-berkembang.

[83] Irfan Adhityo Dinutistomo and Arief Wibisono Lubis, "MSME Lending and Bank Efficiency: Evidence from Indonesia," *Banks and Bank Systems* 16, no. 3 (2021): 93–103.

[84] World Bank, "Domestic Credit to Private Sector (% of GDP) - Indonesia," *The World Bank*, last modified 2022, https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS?locations=ID&view=chart.

[85] World Bank, "Domestic Credit to Private Sector (% of GDP) - Indonesia."

[86] Ahlis Fatoni et al., "Empowering Farmers' Independence and Boosting Local Economy Through Regenerative Farming and Islamic Contracts in Goa Village, West Sumbawa," *FiTUA: Jurnal Studi Islam* 4, no. 2 (2023): 146–159.

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development of the country[87]. Minimal access to capital can be seen as an opportunity for Smart Sukuk as an alternative form of financing for Micro, Small, and Medium Enterprises (MSMEs), encouraging sustainable development in Indonesia[88]. Furthermore, the Sukuk market is accessible only to governments and large-scale institutions due to the complexity and cost of issuance[89]. The establishment of Smart Sukuk Indonesia is expected to bring new hope that various institutions, both small and large, can utilize this instrument.

The Smart Sukuk Challenge

Although there are many advantages of using blockchain in financial institutions, such as ease of delivery of financial services to everyone, low fees, ease of procedures, mediation expenses and increased profitability as a result of all these and many other advantages, however, we cannot ignore the challenges hindering this revolutionary technology's adoption[90].

Regulation

Depending on how the blockchain is used, the characteristics and peculiarities of the blockchain will always present regulatory and legal challenges [91]. While on the other hand, without approval from the authorities, products such as capital market instruments generally cannot be issued. The regulatory authority for the Sukuk market is primarily the capital market regulator or securities commission in each country. One of the main reasons why regulatory authorities oversee the capital market is to ensure that investors are protected [92]. In most countries, competent legislatures do not pass clear laws to control financial transactions through modern blockchain technology and its applications [93]. Suppose there is no centralized regulatory authority to oversee all aspects of issuance. In that case, there is a possibility of violating some of the consumer protection standards that apply in the capital market [94].

Until now, in Indonesia, there is no Financial Services Authority Regulation (POJK) that specifically regulates Smart Sukuk or related similar instruments. OJK itself, in the results of a study by the Ministry of Finance regarding Smart Sukuk [95], identified similarities in the existing Smart Sukuk business processes with crowdfunding services or equity crowdfunding (ECF) which have been regulated through POJK No.37/POJK.04/2018 concerning Crowdfunding Services Through an Information Technology-Based Share Offering and signalling that a separate POJK will be issued regarding Smart Sukuk. However, when referring to POJK Number 57/POJK.04/2020 [96] concerning Securities

[87] World Bank, "Domestic Credit to Private Sector (% of GDP) - Indonesia."

[88] Zulfatus Sa'diah and Raisatul Karimah, "Impulsive Buying Behavior Perspective of Maslahah Imam Al Ghazali : Study on Shopping Behavior of Visitors in Solo Grand Mall Shopping Center," *FiTUA: Jurnal Studi Islam* 4, no. 2 (2023): 198–211.

[89] Blossom, "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain."

[90] Omar Alaeddin, Mohanad Al Dakash, and Tawfik Azrak, "Implementing the Blockchain Technology in Islamic Financial Industry: Opportunities and Challenges," *Journal of Information Technology Management* 13, no. 3 (2021): 99–115.

[91] Nathan Fulmer, "Exploring the Legal Issues of Blockchain Applications," *Akron Law Review* 52, no. 1 (2019): 161–192, https://ideaexchange.uakron.edu/cgi/viewcontent.cgi?article=2449&context=akronlawreview.

[92] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."

[93] Alaeddin, Dakash, and Azrak, "Implementing the Blockchain Technology in Islamic Financial Industry: Opportunities and Challenges."

[94] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."

[95] "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."

[96] (2020)

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Offering through Information Technology-Based Crowdfunding Services, an update of the previous POJK, smart Sukuk is a different instrument from crowdfunding securities, and the regulation does not include smart Sukuk. Therefore, until now, no regulation specifically regulates Smart Sukuk instruments in Indonesia.

The point to understand is that the Sukuk blockchain can also fail, and the risk of default remains. Thus, the continuous disclosure requirements imposed by regulatory authorities and imposing penalties for non-compliance are critical to successfully implementing the Smart Sukuk project[97].

The Tax Treatment of Sukuk is Still Unclear

Regulations regarding the issuance and taxation[98] of cryptocurrencies and maintenance of blockchain tokens raise important questions about how digital assets should be classified. Smart contracts may demand different treatment from traditional contract law[99]. Since its publication in 2019, no smart Sukuk provisions and tax collection schemes have been proclaimed or implemented. According to Imron et al.,[100], potential tax treatment that can be applied to smart Sukuk includes the Income Tax (PPh) regime, Value Added Tax (PPN) and electronic transaction tax (PTE) based on the existing tax regulation regime plus Perpu 1/202017, PMK 48/PMK.03/202018, Regulation of the Director General of Taxes Number PER-12/PJ/2020 regarding profits and existing financial services.

Cyber Risk

As online applications, blockchain-based instruments can be exposed to cyber risks such as hacking[101]. There are vulnerabilities in smart contracts, where the potential for coding errors and errors that cannot be detected has the opportunity to be exploited [102]. This security issue can also occur in Indonesia's smart Sukuk, a blockchain-based smart contract innovation. Therefore, a more extensive security analysis is needed before the issuance of Sukuk to help conceptualize a safe deployment framework in the Islamic finance sector[103].

In the case of Indonesia, complex technology is one of the main obstacles to adopting this leading innovation, especially in human resources. Even though it is a moral hazard, it cannot be denied that human resources determine the success of smart contracts. When designing and building a smart contract from scratch or a localized version, the security vulnerability lies in the execution. On average, programmers and developers cannot implement blockchain[104] because they require special skills, while human resources in this field are still relatively scarce in Indonesia.

In addition to these risks, the risk of hacking also has the potential to arise. Data leaks have often occurred in several national-scale companies and Indonesian government

[97] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."
[98] Lokot Zein Nasution, "Strategi Pengembangan Sukuk Korporasi Di Indonesia: Metode Analytical Hierarchy Process," *Inovasi* 14, no. 1 (2017): 13–27, http://jurnal.balitbang.sumutprov.go.id/index.php/inovasi/article/view/83.
[99] Fulmer, "Exploring the Legal Issues of Blockchain Applications."
[100] "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."
[101] Kunhibava et al., "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review."
[102] Khan et al., "Tokenization of Sukuk: Ethereum Case Study."
[103] Khan et al., "Tokenization of Sukuk: Ethereum Case Study."
[104] Akashdeep Bhardwaj et al., "Penetration Testing Framework for Smart Contract Blockchain," *Peer-to-Peer Networking and Applications* 14, no. 5 (2021): 2635–2650.

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agencies. At the beginning of 2022, it was discovered that Bank Indonesia had experienced a data leak. Also, much news in the media informs that the customer data of Tokopedia, Shopee, Yahoo, Instagram and others have been leaked due to acts of burglary carried out by bad actors [105]. The condition in Indonesia is still low and weak cyber security, and this is what encourages much hacking of individual personal data, such as addresses, identities to debit cards of bank customers, apart from targeting individual data, the weakness of Indonesia's cyber security is also coloured by cases espionage, intelligence, hacking and others[106].

Meanwhile, on the other hand, Sybil's attacks or hacking pose a threat to the blockchain. The attack is carried out by controlling several nodes as bots. The nodes surround the victim node with fake node transactions, so it takes time for the node to verify the transaction. Thus, the victim node becomes vulnerable to double-spend attacks that are difficult to detect and prevent. Attackers use the same coin or Token for several transactions, tricking the blockchain system into accepting fraudulent transactions[107]. Apart from these risks, there are still various cyber smart contract risks. According to[108], other risks are also attached to implementing blockchain-based smart contracts ranging from source code bugs, eclipse attacks, virtual machine vulnerabilities, and insecure runtime environments to the blockchain network itself.

Unbalanced Sukuk Tenor and Liquidity Risk

Based on the results of a study by the Center for Financial Sector Policy[109] shows that the tenor of the Sukuk mudharabah (profit sharing) in the smart Sukuk scheme between BMT Bina Ummah and bondholders is 12 months (1 year). Meanwhile, between BMT Bina Ummah as KSPPS and MSMEs using a murabahah (buy and sell) contract has a longer period, namely 3 (three) years. Apart from this, the payment for the results of mudharabah bonds is carried out using the bullet-covered method, which puts pressure on MSMEs[110]. Bullet covered is a typical bond structure where the principal payment is paid all at once on the maturity date[111], not amortized over the term (monthly instalments)[112]. The method was initially chosen considering the relatively short tenor and as an initial project. However, the bullet-covered form can put pressure on BMT Bina Ummah's performance with a relatively short investment tenor compared to the rather long tenor of financing to MSMEs (about three years). In addition, the bullet-covered method will become a separate issue when BMTs experience liquidity problems at maturity[113]. The secondary market for smart Sukuk has not yet obtained permission from the Financial Services Authority (OJK).

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[105] Aditama Candra Kusuma and Ayu Diah Rahmani, "Analisis Yuridis Kebocoran Data Pada Sistem Perbankan Di Indonesia (Studi Kasus Kebocoran Data Pada Bank Indonesia)," *Supremasi Jurnal Hukum* 5, no. 01 (2022): 46–63.

[106] Makbull Rizki, "Perkembangan Sistem Pertahanan/Keamanan Siber Indonesia Dalam Menghadapi Tantangan Perkembangan Teknologi Dan Informasi," *Politeia: Jurnal Ilmu Politik* 14, no. 1 (2022): 54–62.

[107] Jing Liu and Zhentian Liu, "A Survey on Security Verification of Blockchain Smart Contracts," *IEEE Access* 7 (2019): 77894–77904.

[108] Bhardwaj et al., "Penetration Testing Framework for Smart Contract Blockchain."

[109] "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."

[110] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah."

[111] Kent Osband, "Rational Myopia in Credit Markets," *SSRN Electronic Journal*, no. July (2020).

[112] Patrick B.G van der Wansem, Lars Jessen, and Diego Rivetti, "Issuing International Bonds: A Guidance Note," *MTI Discussion Paper*, no. 13 (2019).

[113] Imron et al., "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan

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CONCLUSION

The issuance of Indonesian smart Sukuk based on blockchain is a breakthrough in the Islamic finance industry. So it is natural that this issue gets special attention and becomes the focus of many researchers. Its emergence in the Islamic finance industry is necessary to increase effectiveness, especially in Sukuk operations. Smart Sukuk has several opportunities to develop in Indonesia, such as (1) The majority Muslim population, (2) Increasing promising young investors, and (3) the number of MSMEs that are still constrained by capital is still very large. In contrast, some of the challenges that smart Sukuk must face in their development are (1) Lack of regulation and legality, (2) Tax collection provisions and schemes, (3) Cyber Risk, and (4) Unbalanced Sukuk tenors and liquidity risk.

Recommendation

1. To date, Smart Sukuk has no specific regulations. There needs to be an in-depth study as well as regulatory bids related to these instruments.
2. The role and function of the smart sukuk fintech can be amplified through a linkage program between the smart sukuk fintech ecosystem and banks and other financial institutions. The linkage program between the Smart Sukuk ecosystem and banks and other financial institutions is an important strategy in an effort to escalate the role and function of Smart Sukuk, especially for MSME financing. Until now, no study has specifically addressed the 'smart sukuk program linkage.'
3. Comparative analysis of the costs of issuing smart sukuk and traditional sukuk in Indonesia to find out whether there are significant differences in the issuing costs between the two types of Sukuk.

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BIBLIOGRAPHY

(OJK), Otoritas Jasa Keuangan. *Peraturan Otoritas Jasa Keuangan Nomor 57 /POJK.04/2020 Tentang Penawaran Efek Melalui Layanan Urun Dana Berbasis Tekhnologi Informasi*. *Otoritas Jasa Keuangan Republik Indonesia*. Indonesia, 2020.

AFPI. "Bagaimana Fintech Pendanaan Bersama Bisa Membuat UMKM Indonesia Lebih Berkembang?" Last modified 2021. https://www.afpi.or.id/articles/detail/umkm-indonesia-lebih-berkembang.

Ahmad, Azlin Alisa. "Blockchain Technology – Towards Complementing the Structuring of Sukuk: A Literature Review." *International Journal of Social Science and Human Research* 4, no. 5 (2021): 1068–1073.

Alaeddin, Omar, Mohanad Al Dakash, and Tawfik Azrak. "Implementing the Blockchain Technology in Islamic Financial Industry: Opportunities and Challenges." *Journal of Information Technology Management* 13, no. 3 (2021): 99–115.

Bhardwaj, Akashdeep, Syed Bilal Hussian Shah, Achyut Shankar, Mamoun Alazab, Manoj Kumar, and Thippa Reddy Gadekallu. "Penetration Testing Framework for Smart Contract Blockchain." *Peer-to-Peer Networking and Applications* 14, no. 5 (2021): 2635–2650.

Bhuiyan, Rubaiyat Ahsan, Maya Puspa, Buerhan Saiti, and Gairuzazmi Mat Ghani. "Comparative Analysis between Global Sukuk and Bond Indices: Value-at-Risk Approach." *Journal of Islamic Accounting and Business Research* 11, no. 6 (2020): 1245–1256.

Blossom. "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain." *Blossom Finance*. Last modified 2017. https://blossomfinance.com/posts/islamic-finance-upgraded-smarter-sukuk-using-blockchain.

Dailysocial.id. *MSME Empowerment Report 2021: Revive and Thrive with Digitalization*, 2021.

Delle Foglie, Andrea, Ida Claudia Panetta, Elias Boukrami, and Gianfranco Vento. "The Impact of the Blockchain Technology on the Global Sukuk Industry: Smart Contracts and Asset Tokenisation." *Technology Analysis and Strategic Management* 0, no. 0 (2021): 1–15. https://doi.org/10.1080/09537325.2021.1939000.

Dinutistomo, Irfan Adhityo, and Arief Wibisono Lubis. "MSME Lending and Bank Efficiency: Evidence from Indonesia." *Banks and Bank Systems* 16, no. 3 (2021): 93–103.

Dogan, Mesut, Mustafa Kevser, and Elif Erer. *Islamic Finance and Recent Development*. Eylül, Ankara: Gazi Kitabevi Tic. Ltd. Şti., 2021.

Elasrag, Hussein. "Blockchains for Islamic Finance: Obstacles & Challenges." *Munich Personal RePEc Archive*, no. 03 (2019): 1–39. https://mpra.ub.uni-muenchen.de/id/eprint/92676.

Fadila, Raehan, Sebastian Herman, and Eri Heriyanto. "The Influence of Macroeconomic Variables on Trading of Sukuk Negara During Pandemic: Case of Indonesia." *Al-Infaq: Jurnal Ekonomi Islam* 13, no. 1 (2022): 105.

Fatoni, Ahlis, Mega TR Luik, Auwal Adam Sa'ad, and Ferdi Zanuar Azan. "Empowering Farmers' Independence and Boosting Local Economy Through Regenerative Farming and Islamic Contracts in Goa Village, West Sumbawa." *FiTUA: Jurnal Studi Islam* 4, no. 2 (2023): 146–159.

Febriandika, Nur Rizqi, Afifah Nur Millatina, Luthfiyatillah, and Sri Herianingrum. "Customer E-Loyalty of Muslim Millennials in Indonesia: Integrated Model of Trust,

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User Experience and Branding in E-Commerce Webstore." *ACM International Conference Proceeding Series* (2020): 369–376.

Finance, Blossom. "Islamic Finance Upgraded: Smarter Sukuk Using Blockchain." Last modified 2018. https://blossomfinance.com/posts/islamic-finance-upgraded-smarter-sukuk-using-blockchain.

Fulmer, Nathan. "Exploring the Legal Issues of Blockchain Applications." *Akron Law Review* 52, no. 1 (2019): 161–192.

Grassi, Laura, Davide Lanfranchi, Alessandro Faes, and Filippo Maria Renga. "Do We Still Need Financial Intermediation? The Case of Decentralized Finance – DeFi." *Qualitative Research in Accounting and Management* 19, no. 3 (2022): 323–347.

Hamza, Osama. "Smart Sukuk Structure from Sharia Perspective and Financing Benefits: Proposed Application of Smart Sukuk through Blockchain Technology in Islamic Banks within Turkey." *EJIF – European Journal of Islamic Finance*, no. Second Special Issue (2020): 1–8. https://www.ojs.unito.it/index.php/EJIF/article/view/3983.

Herman. "BEI Permudah Persyaratan Dan Insentif Biaya Pencatatan Sukuk." *BeritaSatu.Com*, 2021. https://www.beritasatu.com/ekonomi/751397/bei-permudah-persyaratan-dan-insentif-biaya-pencatatan-sukuk.

Iftikhar, Sarah. "A Comparative Analysis Of Cost And Benefits Of Blockchain Based Smart Sukuk Vs. Traditional Sukuk." Institute of Business Administration (IBA), 2018.

Iman, Aldi Khusmufa Nur, and Sirajul Arifin. "The Advantages and Challenges of Implementing Sukuk Through Blockchain Technology." *An-Nisbah: Jurnal Ekonomi Syariah* 8, no. 2 (2021): 247–270.

Imron, Muhammad, Subkhan, Risnandar, Lokot Zein Nasution, Afif Hanifah, and Era Dewi Irianti. "Kajian Smart Sukuk: Potensi Pembiayaan UMKM Dan Pendalaman Pasar Keuangan Syariah." *Kajian Kelompok Analis Syariah (Pusat Kebijakan Sektor Keuangan-Badan Kebijakan Fiskal)* (2020). https://fiskal.kemenkeu.go.id/files/berita-kajian/file/1641441201_kajian_smart_sukuk_revisi_2021.pdf?msclkid=40c2a6e4cf9611ec896c58bf4357c768.

Indonesia, Asosiasi Penyedia Jasa Internet. *Profil Internet Indonesia 2022*. *Apji.or.Od*. Jakarta, 2022. apji.or.id.

Intan, Novita. "OJK: 88,1 Persen Pengguna Internet Belanja Pakai E-Commerce." *Republika Online*. Last modified 2021. https://www.republika.co.id/berita/r2i9wt320/ojk-881-persen-pengguna-internet-belanjapakai-ecommerce.

Karina, Luthfia Ayu. "Peluang Dan Tantangan Perkembangan Green Sukuk Di Indonesia." In *Conference On Islamic Management Accounting and Economics*, 2:259–265, 2019.

Keshminder, J. S., Mohammad Syafiq Abdullah, and Marina Mardi. "Green Sukuk – Malaysia Surviving the Bumpy Road: Performance, Challenges and Reconciled Issuance Framework." *Qualitative Research in Financial Markets* 14, no. 1 (2022): 76–94.

Keuangan, Otoritas Jasa. *Laporan Perkembangan Keuangan Syariah Indonesia 2020*, 2020.

Khan, Nida, Bilal Kchouri, Nissar Ahmad Yatoo, Zsofia Kräussl, Anass Patel, and Radu State. "Tokenization of Sukuk: Ethereum Case Study." *Global Finance Journal* 51, no. April (2022).

Kunhibava, Sherin, Zakariya Mustapha, Aishath Muneeza, Auwal Adam Sa'ad, and Mohammad Ershadul Karim. "Ṣukūk On Blockchain: A Legal, Regulatory And Sharī'ah Review." *ISRA International Journal of Islamic Finance* 13, no. 1 (2021): 118–135.

Kusuma, Aditama Candra, and Ayu Diah Rahmani. "Analisis Yuridis Kebocoran Data Pada Sistem Perbankan Di Indonesia (Studi Kasus Kebocoran Data Pada Bank Indonesia)." *Supremasi Jurnal Hukum* 5, no. 01 (2022): 46–63.

Liu, Jing, and Zhentian Liu. "A Survey on Security Verification of Blockchain Smart

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Contracts." *IEEE Access* 7 (2019): 77894–77904.

Lubis, Nurchaliza, and Helda Fitri Febrianty. "Internet Influencing Economic Growth: What and How Much? A Case Study of Indonesia Using Time Series Data (2001-2016)." *SSRN Electronic Journal*, no. April (2018).

Makbull Rizki. "Perkembangan Sistem Pertahanan/Keamanan Siber Indonesia Dalam Menghadapi Tantangan Perkembangan Teknologi Dan Informasi." *Politeia: Jurnal Ilmu Politik* 14, no. 1 (2022): 54–62.

Malika, Bealkama. "Sukuk Tokenization: Successful Experiences." *Journal of Studies in Economics and Management* 4, no. 1 (2021): 904–923. https://www.asjp.cerist.dz/en/article/155687.

Mansyur, Abdurrahman, and Engku Muhammad Tajuddin bin Engku Ali. "The Adoption of Sharia Fintech Among Millenial in Indonesia: Moderating Effect of Islamic Financial Literacy on UTAUT 2." *International Journal of Academic Research in Business and Social Sciences* 12, no. 4 (2022).

Market, International Islamic Financial. *10 Years of Research: Sukuk Report, A Comprehensive Study of The Global Sukuk Market*, 2021.

Melani, Agustina. "BEI Beri Stimulus Biaya Pencatatan Sukuk, Simak Aturan Barunya." *Liputan 6*. Last modified 2021. Accessed September 6, 2022. https://m.liputan6.com/saham/read/4516911/bei-beri-stimulus-biaya-pencatatan-sukuk-simak-aturan-barunya.

Muchtar, Masruri. "Opportunities and Challenges of Retail Sovereign Sukuk Issuance: Lessons from Twelve Years' Experience." *Signifikan: Jurnal Ilmu Ekonomi* 10, no. 2 (2021): 259–274.

Mutmainah, Lu'liyatul, Nurwahidin, and Nurul Huda. "Waqf Blockchain in Indonesia: At A Glance." *AL-AWQAF : Jurnal Wakaf Dan Ekonomi Islam* 14, no. 1 (2021): 31–49.

Nasution, Lokot Zein. "Strategi Pengembangan Sukuk Korporasi Di Indonesia: Metode Analytical Hierarchy Process." *Inovasi* 14, no. 1 (2017): 13–27. http://jurnal.balitbang.sumutprov.go.id/index.php/inovasi/article/view/83.

OJK. "Statistik Saham Syariah - Desember 2019." *OJK*.

Osband, Kent. "Rational Myopia in Credit Markets." *SSRN Electronic Journal*, no. July (2020).

Pana, Elisabeta, and Vikas Gangal. "Blockchain Bond Issuance." *Journal of Applied Business and Economics* 23, no. 1 (2021): 217–226.

Riawan, Martha, Tri Widagdo, and Putri Enjelikal Falah. "The Influence of Millennial Investors on IHSG Movements In Jakarta Indonesia." *Humanities,Management and Science* 2, no. 1 (2021): 661–670.

Sa'diah, Zulfatus, and Raisatul Karimah. "Impulsive Buying Behavior Perspective of Maslahah Imam Al Ghazali : Study on Shopping Behavior of Visitors in Solo Grand Mall Shopping Center." *FiTUA: Jurnal Studi Islam* 4, no. 2 (2023): 198–211.

Sari, Nafizha Trie Permata, and Andriani Kusumawati. "Literature Review : The Efforts To Strengthening of Micro, Small and Medium-Sized Enterprises (MSME) in Indonesia." *Asian Journal of Management, Entrepreneurship and Social Science* 2, no. 01 SE-Articles (2022): 98–115. https://ajmesc.com/index.php/ajmesc/article/view/52.

Schär, Fabian. "Decentralized Finance: On Blockchain And Smart Contract-Based Financial Markets." *Federal Reserve Bank of St. Louis Review* 103, no. 2 (2021): 153–174.

Septiana, Nurul Izzati, and Hilda Sanjayawati. "Sukuk on Blockchain: Application, Advantages, and Challenges." *Jihbiz jurnal ekonomi keuangan dan perbankan syariah* 5, no. 2 (2021): 120–133.

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Shaikh, Shazib, and Fatima Zaka. *Blockchained Sukuk-Financing*. *Lecture Notes in Business Information Processing*. Vol. 345. Springer International Publishing, 2019. http://dx.doi.org/10.1007/978-3-030-19037-8_5.

Smaoui, Houcem, and Mohsin Khawaja. "The Determinants of Sukuk Market Development." *Emerging Markets Finance and Trade* 53, no. 7 (2017): 1501–1518.

Soekarno, Subiakto, and Shirley Pranoto. "Influence of Financial Literacy on the Stock Market Participation and Financial Behavior among Indonesian Millennials." *International Symposia in EConomic Theory and Econometrics* 27 (2020): 115–125.

Sofyan, Syaakir, Nursyamsu, A Syathir Sofyan, Abdurrahman Mansyur, Sitti Aisya, Noval, and Nurfitriani. "Evaluating Indonesian Islamic Financial Technology Scholarly Publications : A Bibliometric Analysis." *IKONOMIKA: Jurnal Ekonomi dan Bisnis Islam* 7, no. 2 (2022): 233–256.

Syarifuddin, Syarifuddin, Ega Rusanti, Mega Octaviany, and Abdurrahman Mansyur. "Acceleration and Strengthening of Sharia Financial Inclusion Through Merging Sharia Banking in Indonesia." *Jurnal Ekonomi dan Bisnis Islam (Journal of Islamic Economics and Business)* 7, no. 1 (2021): 130.

Thakor, Anjan V. "Fintech and Banking: What Do We Know?" *Journal of Financial Intermediation* 41, no. July (2020).

Uddin, Md Hamid, Sarkar H. Kabir, Mohammad Kabir Hassan, Mohammed S. Hossain, and Jia Liu. "Why Do Sukuks (Islamic Bonds) Need a Different Pricing Model?" *International Journal of Finance and Economics* 27, no. 2 (2022): 2210–2234.

Wansem, Patrick B.G van der, Lars Jessen, and Diego Rivetti. "Issuing International Bonds: A Guidance Note." *MTI Discussion Paper*, no. 13 (2019).

World Bank. "Domestic Credit to Private Sector (% of GDP) - Indonesia." *The World Bank*. Last modified 2022.

Yildirim, Seda, Durmus Cagri Yildirim, and Pelin Diboglu. "Does Sukuk Market Development Promote Economic Growth ?" *PSU Research Review* 4, no. 3 (2020): 209–218.

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