

BLOCKCHAIN, SMART CONTRACTS, AND CRYPTOCURRENCY IN ISLAMIC FINANCE: SHARIAH COMPLIANCE AND GOVERNANCE

Kartika Marella Vanni¹, Muhlis², Nur Fatoni³, Wahab⁴

^{1,2,3,4}Faculty of Islamic Economics and Business

Universitas Islam Negeri Walisongo Semarang, Indonesia

Email: ¹kartikamv@walisongo.ac.id, ²muchlisyahya@walisongo.ac.id,

³nurfatoni@walisongo.ac.id, ⁴wahab@walisongo.ac.id

Abstract

This study analyses the shariah compliance of blockchain, smart contracts, and cryptocurrency and formulates a shariah governance framework relevant to the digital era. A qualitative library research design with a normative-juridical and conceptual approach, using content analysis of fatwas, national regulations, AAOIFI and IFSB standards, and scholarly literature published between 2015 and 2026, validated through source triangulation. Blockchain is technology-neutral and converges with maqashid al-shariah through transparency, traceability, and gharar reduction. Smart contracts can satisfy the pillars of aqd provided the encoded substance complies with shariah and the parties are verified. Cryptocurrency rulings remain fragmented because authorities differ in tahqiq al-manath rather than in principle. A multi-layered shariah governance framework is therefore required. DSN-MUI and OJK should develop national shariah screening criteria for digital assets, operators offering shariah-labelled products should be required to establish shariah supervisory functions, and universities should prepare graduates with combined fiqh and technology competence. The study integrates three technological objects into one compliance framework and links normative fiqh analysis with international governance standards and Indonesia's post-P2SK regulatory regime.

Keywords: blockchain; smart contract; cryptocurrency; shariah compliance; shariah governance

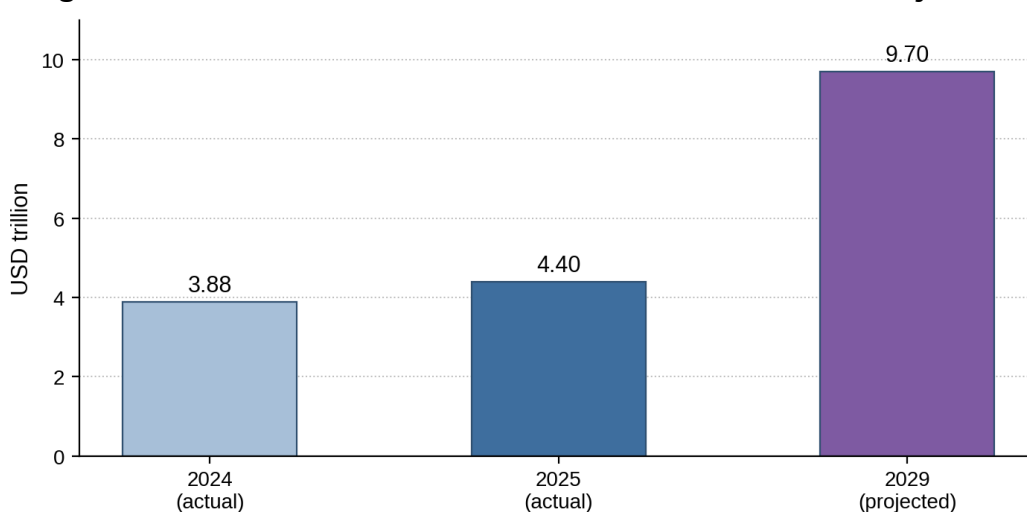
A. INTRODUCTION

The fourth industrial revolution and the acceleration of post-pandemic digitalisation have driven the massive adoption of financial technology, with blockchain, smart contracts, and cryptocurrency emerging as the three most disruptive innovations of the past decade (Swan, 2015; Tapscott & Tapscott, 2016). Blockchain, the distributed ledger technology first popularised through the Bitcoin whitepaper (Nakamoto, 2008), enables transaction records that are transparent, decentralised, and practically impossible to manipulate. Smart contracts, further developed through the Ethereum platform (Buterin, 2014), allow agreements to be executed automatically without an intermediary.

Cryptocurrency, in turn, is a cryptography-based digital asset now traded globally with a market capitalisation measured in trillions of dollars.

This phenomenon intersects directly with a rapidly growing Islamic finance industry. The Islamic Financial Services Board recorded total global Islamic financial services assets of USD 3.88 trillion in 2024, growing 14.9 per cent year on year, and rising to USD 4.4 trillion in 2025 with growth of 13.4 per cent (IFSB, 2025, 2026). LSEG and ICD (2025) project that global Islamic financial assets will reach USD 9.7 trillion by 2029, growing at an average of 10 per cent per year, as illustrated in Figure 1. At the same time, IFSB (2025) explicitly notes that cryptocurrency-related activity, covering trading, investment, and tokenisation, is becoming increasingly prominent within the Islamic financial landscape, marked among others by the presence of crypto exchanges licensed by the Central Bank of Bahrain that offer shariah-compliant services.

Figure 1. Global Islamic Financial Services Assets and Projection



Source: Processed from IFSB (2025, 2026) and LSEG & ICD (2025)

Indonesia, the country with the largest Muslim population in the world and ranked fourth in the Islamic Finance Development Indicator (LSEG & ICD, 2025), presents an interesting paradox. Data from the Financial Services Authority (OJK) show that the number of crypto-asset investors in Indonesia surpassed 20.19 million people as of December 2025, with a cumulative transaction value of IDR 482.23 trillion throughout 2025 and 1,391 crypto assets registered as tradable as of January 2026 (OJK, 2026). The number of crypto investors has even exceeded the number of capital market investors. Ironically, the majority of these investors are Muslim, while the Ijtima Ulama of the Indonesian Council of Ulama Fatwa Commission in 2021 ruled that the use of cryptocurrency as a currency is forbidden because it contains gharar and dharar and conflicts with Law No. 7 of 2011 on Currency, and that its trading as a commodity is invalid where the conditions of sil'ah are not met (MUI, 2021). Similar rulings were issued by the Bahtsul Masail Institute of PBNU and the Tarjih Council of Muhammadiyah in 2021, both prohibiting cryptocurrency as a medium of exchange and as an investment instrument on the grounds of maysir and gharar.

The gap between market adoption and shariah rulings is further complicated by regulatory dynamics. Through Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector, supervision of crypto assets was transferred from Bappebti to OJK effective in 2025, and crypto was reclassified from a commodity into a digital financial asset. OJK subsequently issued POJK No. 27 of 2024, POJK No. 23 of 2025, and POJK No. 30 of 2025 on the governance and risk management of operators, accompanied by a whitelist of 29 licensed entities (OJK, 2025, 2026). This reclassification opens a new fiqh discourse: if crypto is a digital financial asset recognised by the state and supervised by an authority, does the illat underpinning earlier prohibitive fatwas remain relevant?

At the same time, several Muslim jurisdictions have taken a different direction. The Shariah Advisory Council of the Securities Commission Malaysia (2020) resolved that trading digital assets on registered exchanges is permissible, Bahrain has licensed shariah-certified crypto exchanges, and Dubai has built a virtual asset ecosystem through VARA. This cross-jurisdictional fragmentation of fatwas and regulation underlines the urgency of a comprehensive study that does not stop at the permissibility of cryptocurrency alone, but also reaches the shariah compliance of blockchain and smart contracts and the architecture of shariah governance surrounding them.

A review of national and international literature identifies five interrelated research gaps that motivate this study, namely a gap in research focus, a theoretical and conceptual gap, an empirical and jurisdictional gap, a gap in the currency of data and regulation, and a methodological gap. Because these gaps constitute the analytical point of departure of the present work, they are elaborated and mapped systematically against prior studies in subsection B.5 of the literature review.

Accordingly, this study aims to analyse the shariah compliance of blockchain technology and its potential for Islamic finance, to evaluate the conformity of smart contracts with the pillars and conditions of aqd in fiqh muamalah, to map the legal status of cryptocurrency through a comparison of fatwas across jurisdictions together with their underlying illat, and to formulate a shariah governance framework adaptive to the digital finance era. The contribution of this research is theoretical, in enriching the conceptual framework of shariah-compliant digital finance, and practical, as policy input for DSN-MUI, OJK, the National Committee for Islamic Economy and Finance, and industry participants.

B. LITERATURE REVIEW

1. Blockchain and Distributed Ledger Technology

Blockchain is a distributed database that stores transaction records in cryptographically linked blocks, validated through a consensus mechanism and replicated across all network nodes, making it transparent, traceable, and resistant to manipulation (Nakamoto, 2008; Narayanan et al., 2016). Swan (2015) classifies the evolution of blockchain into three generations: Blockchain 1.0 for digital currency, Blockchain 2.0 for smart contracts and financial applications, and Blockchain 3.0 for cross-sector applications. In the context of Islamic finance, Mohamed and Ali (2019) and Elasrag (2019) argue that the transparency and traceability of blockchain accord with the principles of amanah, justice, and the prohibition of deception, making it applicable to sukuk, zakat, waqf, and contract-based financing.

2. Smart Contracts and Aqd in Fiqh Muamalah

A smart contract is a computer protocol that executes the terms of an agreement automatically once the prescribed conditions are met, running on a blockchain without a third party (Buterin, 2014). In fiqh muamalah, the validity of a contract is determined by the fulfilment of its pillars, namely the contracting parties, the object of the contract, and the offer and acceptance, together with its conditions of validity, including clarity of the object and the consent of the parties (Antonio, 2001; Az-Zuhaili, 2011). Contemporary literature argues that a smart contract is essentially a medium or wasilah for executing a contract, so that its shariah validity depends on the substance of the contract encoded within it rather than on the technology itself (Alam et al., 2019; Mohamed & Ali, 2019).

3. Cryptocurrency from Maqashid and Fiqh Perspectives

Fiqh debate on cryptocurrency revolves around three questions: whether it satisfies the criteria of maal mutaqawwim, whether it is valid as a medium of exchange, and whether its trading is free from prohibited elements such as riba, gharar, maysir, and dharar (Abu-Bakar, 2018; Meera, 2018; Siswantoro et al., 2020). Evans (2015) was among the earliest to argue that Bitcoin is more consistent with Islamic financial principles than interest-based fiat money, while Oziev and Yandiev (2018) and Kirchner (2021) demonstrate a spectrum of scholarly opinion ranging from absolute prohibition to conditional permissibility. Yuneline (2019) analyses cryptocurrency from technological, economic, legal, and shariah perspectives and concludes that its status is mutasyabihat and therefore requires caution.

4. Shariah Governance

Shariah governance is the set of institutional arrangements ensuring that all activities of an Islamic financial institution comply with shariah principles, both ex ante through the review and opinions of the Shariah Supervisory Board and ex post through shariah audit and supervision (AAOIFI, 2015; IFSB, 2009). Its pillars include the independence, competence, and confidentiality of the board, the consistency of fatwas, and disclosure. In the digital era, this concept has developed towards regulatory technology and supervisory technology for real-time compliance auditing (Muryanto, 2023; Rabbani et al., 2020).

5. Research Gap

The first gap concerns research focus. National studies published in Indonesian accredited journals tend to isolate one object at a time. Abdillah (2023) confines his analysis to the MUI fatwa on the status of cryptocurrency as currency and as a commodity; Fitri (2023) and Gunawan (2025) examine the opportunities and challenges of shariah smart contracts without connecting them to the legal status of the underlying crypto asset; and Desky and Hye (2025) explore blockchain-based shariah-compliant transactions without reaching the governance architecture surrounding them. The international literature displays the same pattern from the opposite direction: Meera (2018), Siswantoro et al. (2020), Oziev and Yandiev (2018), and Kirchner (2021) concentrate on whether cryptocurrency satisfies the criteria of maal and tsaman, while Elasrag (2019), Mohamed and Ali (2019), and Zulkepli et al. (2023) address the

technological layer of blockchain and smart contracts largely in separation from the crypto asset debate. Studies that integrate all three objects within a single shariah compliance framework therefore remain very limited.

The second gap is theoretical and conceptual. Existing work generally terminates at normative halal-haram analysis without connecting its findings to shariah governance theory as developed by IFSB and AAOIFI. Rabbani et al. (2020) conclude that research on governance mechanisms, shariah audit, and compliance risk management for blockchain-based financial products remains embryonic, and the bibliometric mapping by Abu-Husin et al. (2025) confirms that the Islamic fintech and blockchain literature is still dominated by descriptive and conceptual contributions rather than governance modelling. Hidayati et al. (2023), examining the epistemology of DSN-MUI fatwas on financial digitalisation, similarly stop at the level of fatwa reasoning without extending the analysis to the supervisory architecture that would operationalise those fatwas.

The third gap is empirical and jurisdictional, and the fourth concerns the currency of data and regulation. Fatwas and regulatory postures diverge sharply: Malaysia and Bahrain accommodate shariah crypto assets, whereas the fatwa authorities of Indonesia, Egypt through Dar al-Ifta, and Turkey through Diyanet tend towards prohibition (Billah, 2019; Kirchner, 2021; Katterbauer et al., 2022). Research that systematically traces the roots of this divergence in illat and offers a path to harmonisation remains scarce. Moreover, most Indonesian studies rest on pre-2023 data and on the Bappebti supervisory regime, and therefore do not capture the reclassification of crypto as a digital financial asset, the issuance of POJK No. 27 of 2024 and POJK No. 30 of 2025, the licensed platform whitelist, or the surge of investors to 20.19 million, all of which may alter the factual premises on which the 2021 fatwas were built.

The fifth gap is methodological. Prior research is dominated either by purely doctrinal approaches or by purely technological studies conducted in separation, and Zulkepli et al. (2026) note that the sharia discourse on automated contract execution still lacks an analytical structure that simultaneously accommodates fiqh reasoning and the technical behaviour of the code. Interdisciplinary work that brings fiqh muamalah analysis, international governance standards such as the AAOIFI Shariah Standards and the IFSB Guiding Principles, and contemporary regulatory and market realities into a single analytical structure therefore remains an open space.

C. METHOD

1. Research Design

This study applies a qualitative research design of the library research type, in which the entire body of data is drawn from written documents rather than from field observation (Creswell & Creswell, 2018). Two approaches are combined. The normative-juridical approach is used to examine fatwas, standards, and regulations as prescriptive legal materials, following the convention of normative legal research that treats doctrine and positive law as the primary object of analysis (Marzuki, 2017). The conceptual approach is used to construct the shariah governance framework proposed as the output of the study. The design is descriptive-analytical and non-hypothetical, since the objective is to interpret and systematise legal and conceptual meaning rather than to test a causal relationship. Document analysis, as formulated by Bowen (2009), serves as the

operational procedure, encompassing skimming, close reading, and interpretation of the selected documents.

2. Population and Sample

The population of this research comprises all documents addressing blockchain, smart contracts, and cryptocurrency from a shariah perspective published between 2015 and 2026, consisting of fatwas and decisions of shariah authorities, national regulations, international standards and industry reports, and scholarly publications in national and international journals. Because the population is not fully enumerable, purposive sampling is applied with explicit inclusion criteria: documents must address at least one of the three research objects, must originate from an authoritative issuing body or from a peer-reviewed publication, must have been published within the 2015 to 2026 window, and must be accessible in full text. Documents that are merely popular commentary, promotional in nature, or duplicated across sources are excluded.

The application of these criteria produced an analytical corpus of 40 documents, comprising 7 fatwas and decisions of shariah authorities, 6 regulations and sets of official statistics, 5 international standards and reports, and 22 scholarly articles and books. The corpus was deliberately balanced between national and international sources so that the comparison of jurisdictions rests on materials of comparable authority. A further six methodological references were consulted as guidance for the research procedure and are not treated as objects of analysis.

3. Data Source

Primary data comprise fatwas and decisions of shariah authorities, namely the Ijtima Ulama of the MUI Fatwa Commission of 2021, relevant DSN-MUI fatwas, decisions of the Bahtsul Masail Institute of PBNU, rulings of the Tarjih Council of Muhammadiyah, resolutions of the Shariah Advisory Council of the Securities Commission Malaysia, and the AAOIFI Shariah Standards, together with regulations comprising Law No. 7 of 2011 on Currency, Law No. 4 of 2023 on the Development and Strengthening of the Financial Sector, POJK No. 27 of 2024, POJK No. 23 of 2025, and POJK No. 30 of 2025.

Secondary data comprise books and articles in reputable national and international journals published between 2015 and 2026, reports of international bodies including the IFSB Islamic Financial Services Industry Stability Reports for 2025 and 2026 and the LSEG and ICD Islamic Finance Development Indicator Report 2025, and official statistics on digital financial assets and crypto assets published by OJK. All references are managed using the Mendeley reference manager with APA style, as required by the journal template.

4. Variables and Measurement

As a qualitative normative study, this research does not employ operational variables in the statistical sense. What functions as the analytical variable is a set of conceptual constructs, each derived from fiqh and from shariah governance standards and each furnished with qualitative indicators that guide the coding of documents. Measurement is therefore conducted categorically, by assessing whether the indicator is

fulfilled, partially fulfilled, or not fulfilled within the document under analysis, rather than by numerical scoring.

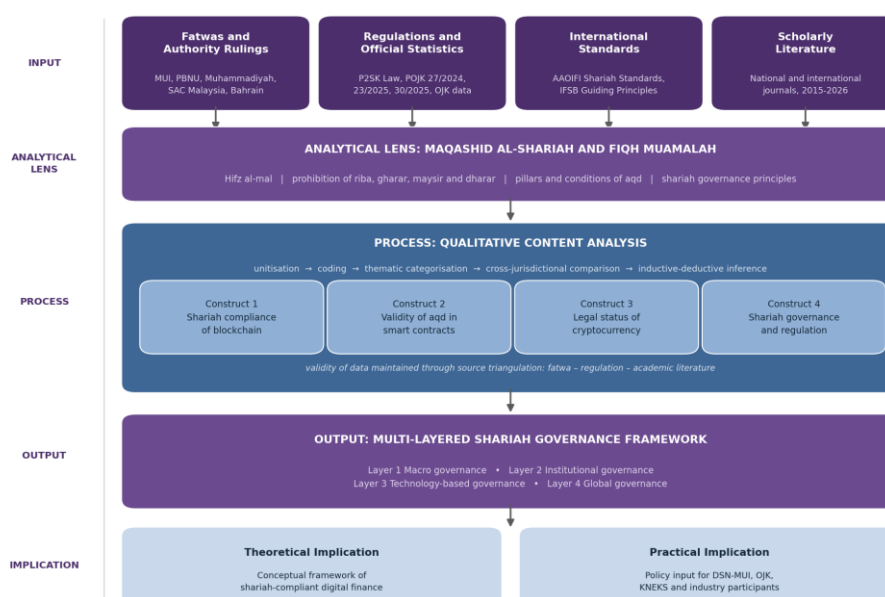
5. Data Analysis Technique

The analytical technique applied is qualitative content analysis in the sense formulated by Krippendorff (2018), namely the systematic and replicable inference of meaning from texts within the context of their use. The procedure follows four stages. The first is unitisation and data condensation, in which the selected documents are reduced to analytical units in the form of legal propositions, arguments of illat, and governance provisions (Miles et al., 2014). The second is coding and thematic categorisation, in which each unit is assigned to one of the four constructs set out in Table 2. The third is cross-jurisdictional comparison, in which the coded material from Indonesia, Malaysia, Bahrain, Egypt, and Turkey is arrayed against one another to expose whether divergence originates in principle or in *tahqiq al-manath*. The fourth is inductive-deductive inference and the drawing of conclusions, in which the categorised findings are synthesised into the proposed governance framework and verified against the source material.

6. Research Framework

The research framework in Figure 2 sets out the logical flow of the study from input to implication. Four categories of document enter the analysis as input and are read through a single analytical lens, namely *maqashid al-shariah* and *fiqh muamalah*, which supplies the normative criteria against which every construct is assessed. The analytical process then proceeds through qualitative content analysis across the four constructs, with source triangulation operating throughout as the validity control. The output is the multi-layered shariah governance framework, from which the theoretical and practical implications of the study are derived.

Figure 2. Research Framework



Source: Developed by the authors, 2026

D. RESULT AND DISCUSSION

1. Shariah Compliance of Blockchain: Technology Neutrality and Maqashid al-Shariah

Analysis of the technical characteristics of blockchain shows that the technology is neutral; its legal position follows the fiqh maxim that the original ruling in muamalah is permissibility so long as no evidence prohibits it. More importantly, four characteristics of blockchain converge with maqashid al-shariah and the principles of Islamic finance, as summarised in Table 3.

Table 1. Convergence of Blockchain Characteristics with Maqashid al-Shariah

No	Characteristic	Shariah Implication	Principle Reinforced
1	Transparency and traceability	Reduces information asymmetry that lies at the root of gharar and tadlis	Clarity of object and mutual consent
2	Immutability of records	Prevents manipulation of records, consistent with the command to record debts in QS. Al-Baqarah [2]: 282	Amanah and accountability
3	Decentralisation	Reduces dependence on intermediaries and lowers transaction costs	Distributive justice
4	Consensus mechanism	Reflects collective verification before a record is accepted	Musyawarah and collective accountability

Source: Processed from Elasrag (2019) and Mohamed & Ali (2019)

Findings reported by IFSB (2025) reinforce this position. Global Islamic financial institutions have adopted distributed ledger technology for the issuance of digital sukuk, blockchain-based distribution of zakat and waqf, and the tokenisation of real assets. The shariah question therefore does not lie in blockchain itself, but in the use cases built upon it.

2. Smart Contracts and Contract Validity: Analysis of Pillars and Conditions

The analysis shows that smart contracts can satisfy the pillars of aqd with a number of qualifications, as set out in Table 4. On the aspect of shighat, contemporary fiqh has accepted contracts concluded through writing and through electronic media, as accommodated by DSN-MUI fatwas permitting transactions through electronic media provided there is mutual consent and the object is clear; automatic execution may be qualified as an acceptance declared in advance through approval of the code. On the aspect of the contracting parties, a challenge arises from the pseudonymity of public blockchains, which complicates verification of legal capacity, and this can be mitigated through permissioned blockchains and the know-your-customer obligations now required under POJK No. 27 of 2024. On the aspect of the object of contract, the object must be lawful, clearly specified, and deliverable.

Table 2. Analysis of Smart Contracts Against the Pillars and Conditions of Aqd

Pillar of Aqd	Implementation in Smart Contracts	Critical Issue	Proposed Mitigation
Shighat (offer and acceptance)	Consent expressed through approval of the code and automatic execution	Rigidity of code against the right of khiyar	Khiyar clause and upgradeable contract mechanism
'Aqidain (contracting parties)	Wallet addresses as party identities	Pseudonymity obscures legal capacity	Permissioned blockchain and mandatory know-your-customer
Ma'qud 'alaih (object)	Digital assets, tokenised assets, or underlying real assets	Object may be unlawful or lack a clear underlying	Shariah screening of the object before deployment
Conditions of validity	Encoded contract logic reflecting murabahah, ijarah, or other contracts	Bugs and exploits create dharar; interest may be repackaged	Shariah code review by the board with technology auditors

Source: Processed by the authors from Alam et al. (2019), Mohamed & Ali (2019), and Muryanto (2023)

The critical issues are substantive rather than formal. Code rigidity conflicts with the right of khiyar and with the renegotiation of agreements; bugs or contract exploits may generate dharar; and there must be assurance that the encoded contract logic genuinely reflects a shariah contract such as murabahah or ijarah rather than an interest-bearing loan repackaged in code. Shariah certification of the code by the Shariah Supervisory Board, assisted by technology auditors, therefore becomes a precondition of validity, a practice already pioneered in the issuance of smart sukuk in several jurisdictions (Alam et al., 2019; Muryanto, 2023).

3. Fatwa Fragmentation on Cryptocurrency: Mapping the Illat and Points of Convergence

A comparison of fatwas across jurisdictions reveals fragmentation rooted in differences of illat and regulatory context, as summarised in Table 5.

Table 3. Comparison of Fatwa Rulings on Cryptocurrency Across Jurisdictions

Authority / Jurisdiction	Ruling	Principal Illat or Argument
Ijtima Ulama MUI, Indonesia (2021)	Forbidden as a currency; as a commodity invalid unless the conditions of sil'ah are met	Gharar and dharar; conflict with the Currency Law
Bahtsul Masail PBNU (2021)	Forbidden	Speculative; does not meet the conditions of a valid object of sale
Tarjih Council of Muhammadiyah (2021)	Forbidden as a medium of exchange and as an investment	Gharar and maysir are dominant
Shariah Advisory Council, SC Malaysia (2020)	Permissible to trade on registered digital asset exchanges	Recognised as maal; regulated platforms reduce gharar
Central Bank of Bahrain	Permissible through licensed and shariah-certified exchanges	Regulatory framework and shariah certification of assets
Dar al-Ifta Egypt; Diyanet Turkey	Forbidden or non-compliant	Volatility, absence of a guarantor authority, money laundering risk
Mufti Muhammad Abu-Bakar (2018)	Permissible with qualifications	Bitcoin as maal 'urfi; permissibility depends on use

Source: Processed from MUI (2021), Securities Commission Malaysia (2020), Billah (2019), Abu-Bakar (2018), and Kirchner (2021)

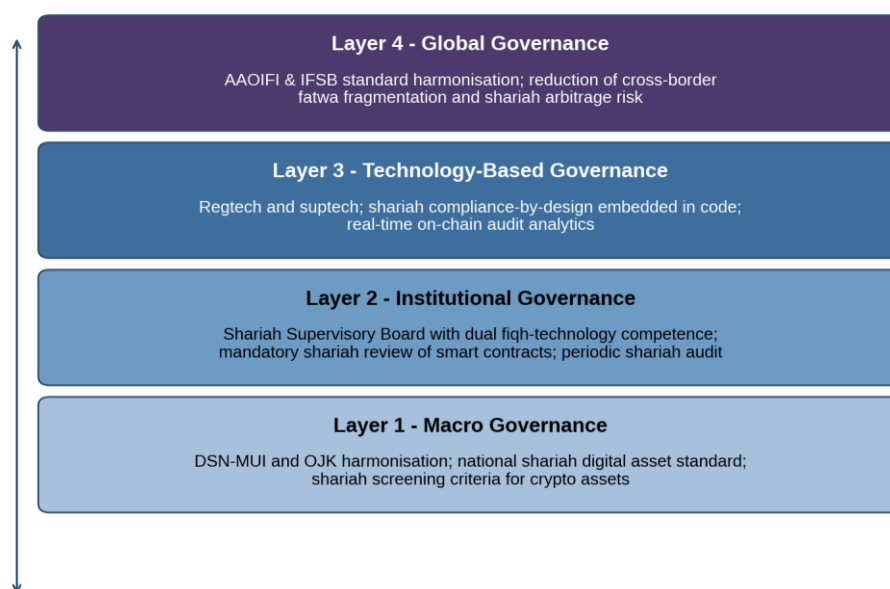
This mapping shows that the difference of opinion does not concern principle, since all authorities agree in prohibiting gharar, maysir, and violations of state law, but rather concerns factual assessment, that is *tahqiq al-manath*: whether the crypto ecosystem in each jurisdiction is sufficiently regulated to suppress those prohibited elements. Consequently, the change in Indonesia's regulatory landscape after the P2SK Law becomes a decisive variable. The reclassification of crypto as a digital financial asset under OJK supervision, mandatory licensing through a whitelist of 29 entities, POJK No. 30 of 2025 on governance and risk management, and the screening mechanism that limits legal trading to 1,391 assets substantially reduce the dimension of dharar and part of the gharar that formed the illat of the 2021 fatwas.

This finding is consistent with the position of Abu-Bakar (2018) and Kirchner (2021) that the shariah status of crypto assets is dynamic and follows the evolution of the ecosystem. Nevertheless, extreme volatility and the speculative motive attached to most altcoins mean that the principle of caution and asset-by-asset shariah screening, based for instance on real utility, the underlying project, and the absence of interest elements within the protocol, remain the most defensible middle path.

4. A Multi-Layered Shariah Governance Framework for the Digital Era

Drawing on a synthesis of the IFSB and AAOIFI standards and jurisdictional best practice, this study formulates a multi-layered shariah governance framework for digital finance consisting of four layers, as presented in Figure 3.

Figure 3. Proposed Multi-Layered Shariah Governance Framework for Digital Finance



Source: Processed by the authors from IFSB (2009), AAOIFI (2015), and Rabbani et al. (2020)

The first layer is macro governance, comprising harmonisation between the fatwa authority DSN-MUI and the regulators OJK and Bank Indonesia through the establishment of a national shariah digital financial asset standard, including shariah screening criteria for crypto assets along the lines already practised for shariah equities through the List of Shariah Securities. The second layer is institutional governance, comprising the strengthening of the Shariah Supervisory Board within digital asset operators with dual competence in fiqh and technology, a mandatory shariah review of smart contracts before deployment, and periodic shariah audit.

The third layer is technology-based governance, comprising the use of regtech and supotech, including embedding shariah compliance parameters directly into the code as compliance-by-design and conducting real-time audit through on-chain analytics, which is made possible precisely by the transparent nature of blockchain itself (Muryanto, 2023; Rabbani et al., 2020). The fourth layer is global governance, comprising active

participation in the harmonisation of international standards through AAOIFI and IFSB in order to reduce the fatwa fragmentation that generates market uncertainty and cross-jurisdictional shariah arbitrage risk.

This framework also responds to the warning of IFSB (2025) that digital financing platforms and crypto-based solutions demand serious attention to investor protection, transparency, and an adequate shariah governance framework. For Indonesia, the consolidation of supervision under OJK and the target of 26 per cent growth in digital asset investors constitute a policy window for introducing a regulated shariah crypto asset segment, a niche with considerable potential given that the majority of the 20.19 million existing investors are Muslim and given the successful precedent of shariah certification in the capital market.

E. CONCLUSION

This study concludes four points. First, blockchain as a technology is neutral and converges with maqashid al-shariah through transparency, traceability, and the reduction of gharar, so that its original ruling is permissibility and it holds potential for digital sukuk, zakat, and waqf. Second, smart contracts can satisfy the pillars and conditions of aqd provided that the substance of the encoded contract complies with shariah, that the parties are verified, and that a mechanism for shariah certification of the code is in place. Third, the status of cryptocurrency is subject to fatwa fragmentation rooted in differences of tahqiq al-manath rather than differences of principle; the change in Indonesia's regulatory regime after the P2SK Law, which reclassifies crypto as a digital financial asset under OJK, opens space for reviewing earlier fatwas through an asset-by-asset shariah screening approach. Fourth, a multi-layered shariah governance framework covering the macro, institutional, technological, and global levels is required, integrating a dually competent Shariah Supervisory Board, shariah compliance-by-design, and the harmonisation of international standards.

The policy implications are threefold. DSN-MUI and OJK need to formulate criteria and a national list of shariah crypto assets; digital asset operators should be required to maintain a shariah supervisory function where they offer shariah-labelled products; and universities need to prepare human resources with cross-disciplinary competence in fiqh and technology. The limitation of this study lies in its library-based approach, which does not empirically test the perceptions of market participants. Further research is advised to employ mixed methods, including surveys of Muslim investors and case studies of smart sukuk implementation, as well as the modelling of a shariah compliance index for crypto assets.

F. REFERENCES

- AAOIFI. (2015). *Shari'ah Standards*. Manama: Accounting and Auditing Organization for Islamic Financial Institutions.
- Abdillah, H. (2023). Hukum cryptocurrency sebagai mata uang dan sebagai komoditas: Analisis fatwa MUI tentang hukum cryptocurrency. *Jurnal Ilmiah Ekonomi Islam*, 9(3), 4245-4255.

- Abu-Bakar, M. M. (2018). *Shariah Analysis of Bitcoin, Cryptocurrency, and Blockchain*. Blossom Labs Working Paper.
- Abu-Husin, M. F., Afifah, K., Rusydiana, A. S., Asnawi, Zafar, M. B., Mohd Noor, M. H., Mastor Mustafa, S. N., & Salleh, M. A. (2025). Research trend in Islamic financial technology and blockchain: A bibliometric analysis. *Malaysian Journal of Syariah and Law*, 13(1), 147-163.
- Alam, N., Gupta, L., & Zameni, A. (2019). *Fintech and Islamic Finance: Digitalization, Development and Disruption*. Cham: Palgrave Macmillan.
- Antonio, M. S. (2001). *Bank Syariah: Dari Teori ke Praktik*. Jakarta: Gema Insani Press.
- Az-Zuhaili, W. (2011). *Fiqh Islam wa Adillatuhu* (Terj.). Jakarta: Gema Insani.
- Billah, M. M. (Ed.). (2019). *Halal Cryptocurrency Management*. Cham: Palgrave Macmillan.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27-40.
- Buterin, V. (2014). *Ethereum: A Next-Generation Smart Contract and Decentralized Application Platform*. Ethereum Whitepaper.
- Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (5th ed.). Thousand Oaks: SAGE Publications.
- Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2), 80-88.
- Desky, H., & Hye, A. K. M. (2025). Exploring smart contracts in Islamic finance: Blockchain-based shariah-compliant transactions. *AT-TIJARAH: Jurnal Penelitian Keuangan dan Perbankan Syariah*, 7(1), 50-61.
- Elasrag, H. (2019). Blockchains for Islamic finance: Obstacles and challenges. *MPRA Paper No. 92676*. Munich Personal RePEc Archive.
- Evans, C. W. (2015). Bitcoin in Islamic banking and finance. *Journal of Islamic Banking and Finance*, 3(1), 1-11.
- Fitri, W. (2023). Kajian penerapan smart contract syariah dalam blockchain: Peluang dan tantangan. *Jatiswara*, 38(2), 223-232.
- Gunawan, D. (2025). Penerapan smart contract dalam keuangan syariah: Tinjauan literatur tentang integrasi cryptocurrency dan blockchain. *Jurnal Ilmiah Ekonomi Islam*, 11(1).
- Hidayati, T., Hidayatullah, M. S., Komarudin, P., & Atika, A. (2023). Digitalization of Islamic finance: Epistemological study of the National Sharia Board-Indonesian Council of Ulama's fatwa. *Al-Ahkam*, 33(2), 255-278.
- IFSB. (2009). *Guiding Principles on Shari'ah Governance Systems for Institutions Offering Islamic Financial Services (IFSB-10)*. Kuala Lumpur: Islamic Financial Services Board.
- IFSB. (2025). *Islamic Financial Services Industry Stability Report 2025: Navigating Shallow Waters*. Kuala Lumpur: Islamic Financial Services Board.

- IFSB. (2026). *Islamic Financial Services Industry Stability Report 2026*. Kuala Lumpur: Islamic Financial Services Board.
- Katterbauer, K., Syed, H., Cleenewerck, L., & Genc, S. (2022). Sharia compliance of cryptocurrencies: Data-driven sharia compliance assessment. *Talaa: Journal of Islamic Finance*, 2(2), 75-85.
- Kirchner, I. K. F. (2021). Are cryptocurrencies halal? On the sharia-compliance of blockchain-based fintech. *Islamic Law and Society*, 28(1-2), 76-112.
- Krippendorff, K. (2018). *Content Analysis: An Introduction to Its Methodology* (4th ed.). Thousand Oaks: SAGE Publications.
- LSEG, & ICD. (2025). *Islamic Finance Development Indicator (IFDI) Report 2025*. London: London Stock Exchange Group & Islamic Corporation for the Development of the Private Sector.
- Majelis Ulama Indonesia. (2021). *Keputusan Ijtima Ulama Komisi Fatwa se-Indonesia VII Tahun 2021 tentang Hukum Cryptocurrency*. Jakarta: MUI.
- Marzuki, P. M. (2017). *Penelitian Hukum* (Edisi Revisi). Jakarta: Kencana.
- Meera, A. K. M. (2018). Cryptocurrencies from Islamic perspectives: The case of Bitcoin. *Buletin Ekonomi Moneter dan Perbankan*, 20(4), 475-492.
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis: A Methods Sourcebook* (3rd ed.). Thousand Oaks: SAGE Publications.
- Mohamed, H., & Ali, H. (2019). *Blockchain, Fintech, and Islamic Finance: Building the Future in the New Islamic Digital Economy*. Boston: Walter de Gruyter.
- Muryanto, Y. T. (2023). The urgency of sharia compliance regulations for Islamic Fintechs: A comparative study of Indonesia, Malaysia and the United Kingdom. *Journal of Financial Crime*, 30(5), 1264-1278.
- Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. <https://bitcoin.org/bitcoin.pdf>
- Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). *Bitcoin and Cryptocurrency Technologies: A Comprehensive Introduction*. Princeton: Princeton University Press.
- Otoritas Jasa Keuangan. (2024). *Peraturan OJK Nomor 27 Tahun 2024 tentang Penyelenggaraan Perdagangan Aset Keuangan Digital Termasuk Aset Kripto*. Jakarta: OJK.
- Otoritas Jasa Keuangan. (2025). *Peraturan OJK Nomor 30 Tahun 2025 tentang Tata Kelola dan Manajemen Risiko Penyelenggara ITSK, Aset Keuangan Digital, dan Aset Kripto*. Jakarta: OJK.
- Otoritas Jasa Keuangan. (2026). *Statistik Aset Keuangan Digital dan Aset Kripto, Konferensi Pers RDKB Desember 2025-Januari 2026*. Jakarta: OJK.

- Ozиеv, G., & Yandiev, M. (2018). Cryptocurrency from Shari'ah perspective. *Al-Shajarah: Journal of Islamic Thought and Civilization*, Special Issue: Islamic Banking and Finance, 315-338.
- Rabbani, M. R., Khan, S., & Thalassinis, E. I. (2020). FinTech, blockchain and Islamic finance: An extensive literature review. *International Journal of Economics and Business Administration*, 8(2), 65-86.
- Republik Indonesia. (2023). *Undang-Undang Nomor 4 Tahun 2023 tentang Pengembangan dan Penguatan Sektor Keuangan*. Jakarta: Sekretariat Negara.
- Securities Commission Malaysia. (2020). *Resolutions of the Shariah Advisory Council of the Securities Commission Malaysia on Digital Assets*. Kuala Lumpur: SC Malaysia.
- Siswantoro, D., Handika, R., & Mita, A. F. (2020). The requirements of cryptocurrency for money, an Islamic view. *Heliyon*, 6(1), e03235.
- Swan, M. (2015). *Blockchain: Blueprint for a New Economy*. Sebastopol: O'Reilly Media.
- Tapscott, D., & Tapscott, A. (2016). *Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World*. New York: Penguin.
- Yuneline, M. H. (2019). Analysis of cryptocurrency's characteristics in four perspectives. *Journal of Asian Business and Economic Studies*, 26(2), 206-219.
- Zulkepli, M. I. S., Mohamad, M. T., & Azzuhri, S. R. (2023). Leveraging blockchain-based smart contract in Islamic financial institutions: Issue and relevant solution. *International Journal of Islamic Economics and Finance Research*, 6(1), 18-28.
- Zulkepli, M. I. S., Muneem, A., Mohd Noh, M. S., Mohamad, M. T., & Azzuhri, S. R. (2026). Automated transaction of smart contract: Technology and sharia discourse. *Al-Ahkam*, 36(1), 191-228.