e-ISSN 2597-4157 Jurnal Bisnis Terapan, Volume 07 Nomor 02 (Desember, 2023) 115 - 127 p-ISSN 2580 - 4928

JURNAL BISNIS TERAPAN
Terakreditasi Sinta No. SK: 28/E/KPT/2019
E-mail: jbt.politeknik.ubaya@gmail.com, Penerbit: Politeknik Ubaya, Surabaya

DOI : https://doi.org/10.24123/jbt.v7i2.6061

WHAT DO SHARIAH BOARDS THINK ABOUT AI?

Nurfarahin Mohd Haridan[1], Azizi @ Hamizi Hashim[2], Agung Sriwardhani[3], Nur Hani Binti Ithanin[4], Mohamad Azmi Nias Ahmad[5]

[1,2,4,5]Universiti Teknologi MARA Cawangan; Pahang, Malaysia, [3]Ubaya Polytechnic; Surabaya, Indonesia

Email: azizih@uitm.edu.my

In November 13, 2023, Publish December 23, 2023

Abstract

This paper provides a critical discussion on the functions and capabilities of Shariah boards, considering their ultimate authority in delivering Shariah assurance to stakeholders of Islamic banks. The primary objective of this initiative is to enhance the proficiency of Islamic banking in the realm of digital finance advancement while ensuring rigorous adherence to Shariah principles. This paper discusses the significance of robo advisory in facilitating real-time Shariah counsel by Shariah boards. Additionally, it highlights the potential of blockchain management systems (BMS) in augmenting the monitoring function of Shariah boards, namely in conducting reviews and audit assessments to ensure Shariah compliance in Islamic banks.

Keywords: Shariah board, Shariah compliance, robo advisory,

Introduction

The Islamic financial technology (FinTech) sector has grown steadily, accounting for 18% of worldwide FinTech transaction volume at $79 billion. The 2022 Global Islamic Fintech Report predicts growth of about $179 billion by 2026. Some Islamic banks are collaborating with FinTech startups to improve their digital presence and stay competitive. Nowadays, Artificial intelligence (AI) is transforming banking and investment infrastructure, introducing digital business models like crowdfunding, peer-to peer lending, big data analytics, and mobile devices (Lee and Shin, 2018). Social media and financial information have also greatly impacted financial users' behavior, preferences, and decisions.

The unwavering commitment to Islamic principles and values has played a pivotal role in propelling Islamic banks to reinforce the significance roles and functions of their Shariah boards. Thus, Islamic banks must carefully select Shariah board members. These personnel should have a strong Shariah and ethical background, Islamic banking experience, and technology expertise. The digital revolution in Islamic finance requires transparency about how technical advances correspond with Shariah principles. Shariah boards determine FinTech product permissibility, ensuring Islamic law compliance and establishing stakeholder confidence in digital offers.

These Shariah boards are increasingly responsible for safeguarding conventional Shariah principles and advising on technology-driven financial products and services as the financial industry evolves. Shariah boards may now automate, streamline, and reduce costs while adhering to Shariah principles thanks to the increasing growth of digital financial platforms and solutions. Blockchain technology makes financial transaction Shariah compliance transparent and verifiable (Chong, 2021). Haridan *et al.* (2023) further noted that AI-powered Robo Advisory helps Shariah boards provide Shariah assurance quickly and effectively. Previous studies have stressed the significance of Islamic banks expanding their Shariah boards to oversee FinTech due to the complexity of technology advances (Laldin and Djafri, 2019; Poon *et al*., 2020; Mukhibad, 2023).

This study aims to address this gap by delving into the potential benefits of AI tools to enhance the compliance roles of Shariah boards and reinforce ethical integrity within the rapidly evolving landscape of FinTech integration. The exploration of AI tools, such as blockchain systems, Robo Advisory, and big data analytics, as means to bolster Shariah board compliance roles, adds a valuable dimension to discussions on the adaptive capacities of Islamic financial institutions in response to the evolving challenges posed by FinTech integration. By shedding light on the governance aspects of Shariah boards, this research contributes to the broader discourse on effective strategies for Islamic banks to successfully navigate the intersection of Shariah principles and technological advancements in the digital era.

Research Method

This research is a methodical review of the literature (Xuesong Zhai *et al*, 2021) that manually screened, (adopted from De Bakker *et al.* (2019) method), a list of notable Islamic banking articles to assess Shariah boards' competencies and challenges in advancing financial technology in Islamic banks. Other sources were searched from Google Scholar, Elsevier, Emerald, and journal-specific websites for relevant publications, websites, and databases on artificial intelligence techniques such big data analytics, blockchain, and Shariah robo advice. These key AI tools may improve Shariah boards' relevance, independence, and competence in providing high-quality Shariah compliance assurance. This study set the publication stage to final and restricted the literature categories to articles, conference papers, books, book chapters, and editorials in order to narrow down the search results. (Lin, C.-C et al, 2023). Article abstracts were carefully analyzed (in table 1) to verify the study, addressing Shariah board concerns, competencies, and challenges. Articles from 2016–2023 were used to ensure the concerns were current and relevant to Islamic banking. Researchers also reviewed articles published between 2016 and 2023 to ensure that the materials they were analyzing were up-to-date and relevant to Islamic banking.

Results and Discussions

Table 1. Islamic banking articles to assess Shariah boards' competencies and challenges in advancing financial technology in Islamic banks

No	Title of the articles	Journals	Research Objective	Method	Findings
1.	Quttainah, M.A. and Almutairi, A.R. (2016). Corporate ethics: evidence from Islamic banks.	Journal of Management and Governance	To investigate banks' management behavior in relation to corporate ethics	Panel sample data from 15 distinct countries	Strong Shariah board governance can ensure Islamic banks follow ethical and Shariah norms.
2.	Haridan, N. F. M., Hassan, A. F. S. and Karbhari, Y. (2018). Governance, religious assurance and Islamic banks: Do Shariah boards ffectively serve?	Journal of Management and Governance	To examines the Shariah boards (SBs) roles in undertaking the compliance review	Semi structured interviews	Shariah boards are ceremonial rather than vigilantly monitoring Shariah compliance due to a lack of skills and competences.
3.	La Torre, M., Dumay, J. and Rea, M.A. (2018). Breaching intellectual capital: Critical reflections on big data security.	Meditari Accountancy Research	To review articles discussing issues about intellectual capital and big Data	-	The data ecurity breach poses threat to intellectual capital and value creation, thus, compromise the interest of stakeholders.
4.	Mannai, M. A. and Ahmed, H. (2019). Exploring the workings of Shariah supervisor y board in Islamic finance: A perspective of Shari'ah scholars from GCC.	The Quarterly Review of Economics and Finance	To examines the Shariah board structure, supervision function directly from the SSB members themselves	Semi structured interviews	The Shariah board supervision can impose operational risk in the form of Shariah compliance risk due to the lack of Shariah board independence and transparency.

5.	Meslier, C., Risfandy, T. and Tarazi, A. (2020). Islamic banks' equity financing, Shariah supervisory board, and banking environments.	Pacific-Basin Finance Journal	To investigate the potential determinants of equity financing by Shariah board	Sample data observations were collected from 88 Islamic banks in 16 countries between 2009 and 2014	The duality of Shariah board members positively affects equity financing whereas the existence of a Shariah department within banks has a negative impact.
6.	Tajudin, M., Omar, R., Smedlund, A., Aziz, R. P. (2020). Financing with heart and intelligence: Augmenting intimacy and sustainability through Islamic fintech.	International Journal of Advanced Science and Technology	To explain how Finnish and Malaysian fintech startups promote financial inclusion through e marketplace, payments, and P2P finance.	This research employs literature review, conceptual analysis and qualitative case study methodolo g y	The findings of this research propose that Islamic fintech presents a viable and productive option for acquiring funds in the context of supporting underserved individuals.
7.	Mansoor, M., Ellahi, N., Hassan, A., Malik, Q. A., Waheed, A. and Ullah, N. (2020). Corporate governance, shariah governance, and credit rating: A cross-country analysis from Asian Islamic banks.	Journal of Open Innovation: Technology, Market and Complexity	To investigate the association between corporate governance characteristic, shariah governance characteristic, and the credit rating of Asian Islamic banks	Sample data from 22 banks during the 2006–2018 period	This study found that credit ratings were positively correlated with board size, competencies, women on the board, shariah board size, supervisory shariah board, shariah board interlock, and female shariah scholars.
8.	Manita, R., Elommal, N., Baudier, P. and Hikkerova, L. (2020). The digital transformation of external audit and its impact	Technological Forecasting and Social Change	To examine the impact of digitalization on the audit industry and explore its potential to enhance the effectiveness	Interview	This study emphasizes the necessity of integrating digital tactics into audit businesses to improve audit efficiency,

	on corporate governance.		of audit as a governance tool.		significance, and quality. It can also foster creativity in these organizations.
9.	Poon, J., Chow, Y. W., Ewers, M. and Ramli, R. (2020). The role of skills in Islamic financial innovation: Evidence from Bahrain and Malaysia.	Journal of Open Innovation: Technology, Market, and Complexity	To examines the effect of different skills on IFI innovation	Survey	The Shariah board's expertise can help Islamic banks create asset-based risk sharing instruments to reduce Shariah risks and promote financial innovation.
10.	Safiullah, M., Hassan, M. K. and Kabir, M. N. (2022). Corporate governance and liquidity creation nexus in Islamic banks—Is managerial ability a channel?.	Global Finance Journal	To examine the effect of dual board governance mechanisms (Shariah supervisory board and regular board of directors) on Islamic banks' liquidity creation	Sample data of 110 Islamic and conventiona l banks from 11 countries for the period of 2005–2015	This study found that better Shariah supervisory board (SSB) governance increases on balance sheet liquidity creation but decreases off balance sheet liquidity creation.
11.	Abdeldayem, M. and Aldulaimi, S. (2022). Developing an Islamic crowdfunding model: A new innovative mechanism to finance SMEs in the Middle East.	International Journal of Organizational Analysis	To examine and discuss Islamic crowdfunding (ICF) as an alternative financing method for Middle Eastern and Islamic SMEs.	In-depth interviews	This study proposes an Islamic Shariah compliant crowdfunding paradigm for reward, donation, loan, and equity based crowdfunding.
12.	Mukhibad, H., Nurkhin, A., Anisykurlillah, I., Fachrurrozie, F.	Journal of Open Innovation: Technology, Market, and	To examine the role of the attributes of the shariah	Panel data analysis	This study suggests that banks with larger Shariah boards

	and Jayanto, P. Y. (2023). Open innovation in shariah compliance in Islamic banks – Does shariah supervisory board attributes matter?	Complexity	supervisory board (SSB) on shariah compliance	have lower shariah compliance. The study also shows that Shariah board members' economics, finance, and accounting competence affect compliance.

The researchers decided to implement the procedure in selecting the paper that originated from Lin, C.- C. *et al*. (2023) The search string that was used in the process of selecting this paper was TITLE-ABS KEY ('Artificial intelligence (AI)' OR 'Shariah Board independence' OR 'Shariah Board relevance' OR 'Fintech') AND PUB YEAR > 2015 AND (LIMIT-TO (PUBSTAGE,'final') AND (LIMIT-TO (DOCTYPE,'cp') OR LIMIT-TO (DOCTYPE,'ar') OR LIMIT-TO (DOCTYPE,'ch') OR LIMIT-TO (DOCTYPE,'bk') OR LIMIT-TO (DOCTYPE,'ed') AND (LIMIT-TO (OA,'all')). The researcher filtered them in accordance with the following criteria based on the search criteria mentioned above: Subject: Islamic banks can use artificial intelligence. Key words and overview: The final step involves choosing relevant papers for the dataset for this study based on keywords and abstracts. Paper's main focus: In this review, the main focus is on papers that related to AI implications toward Islamic banking.

This study uses legitimacy theory to examine how Shariah boards oversee Shariah compliance. Dowling and Pfeffer (1975) believed symbolic communication might boost organizational legitimacy, while Weber (1978) believed adherence to social norms and regulations could do so. Legitimacy theory is the broad notion that an entity's activities conform to society standards, values, beliefs, and definitions, according to Suchman (1995). Shariah emphasizes morality, socio-political environment, and Shariah compliance in Islamic banking; stakeholders are narrowed (Chapra and Ahmed, 2002; Dusuki, 2008; Abu-Tapenjeh, 2009; Safieddine, 2009; Todorof, 2018). The Shariah board is entirely responsible for Shariah compliance. The legitimacy thesis states that Shariah boards, the highest Shariah authorities, have a fiduciary duty to guarantee that all banking activities meet stakeholder goals and Shariah standards. However, prior research has identified various challenges that Shariah boards face in effectively fulfilling their roles and responsibilities related to Shariah compliance (Ullah *et al*., 2018; Haridan *et al*., 2018; Mannai and Ahmed, 2019).

Shariah Board Governance in Islamic Bank

The Islamic banking model distinguishes itself from conventional counterparts by adhering to Islamic jurisprudence (Shariah), which prohibits activities involving interest (riba), speculation (gharar), and financing of illicit ventures. Given the distinct nature of Islamic banks, various industries, including FinTech, must establish close collaboration with Shariah boards in overseeing all Shariah-related aspects. They provide independent assurance of Shariah compliance and endorse the religio-ethical legitimacy sought by stakeholders (Bougatef, 2015, Ullah *et al.*, 2018; Todorof, 2018).

Traditionally, the Shariah board plays a fundamental role in providing Shariah advice on financial innovations, conducting periodic reviews and finally verifying in its reports of Shariah-compliant on all financial instruments that the bank offers (AAOIFI, 2010; Ginena, 2014; Bougatef, 2015; Najeeb and Ibrahim, 2014; Quttainah and Almutairi, 2016; Farag *et al*., 2018). It is a fact that the Shariah board is accountable in performing their fiduciary duties of providing Shariah compliance assurance with values prescribed in the al-Quran and al-Hadith, such as being independent and transparent. For example

Fintech Inclusion for Shariah Compliance Assurance in Islamic Bank

The convergence of finance and technological innovation has ushered in the era of FinTech, which has significantly disrupted traditional financial business models and introduced highly efficient solutions for banks including Islamic bank. It is irrefutable that FinTech is catalyzing positive change within the Islamic banking industry. To remain competitive in this evolving landscape, Islamic banks are compelled to actively engage in innovation and undertake a profound transformation of their traditional financial infrastructure. Moreover, the integration of value-added solutions offered by FinTech with existing bank platforms has the potential to provide Islamic banks with a more streamlined and operationally efficient capability.

The positive impact and value created by FinTech inclusion present new challenges for Shariah boards in addressing Shariah-related issues and defining appropriate Shariah parameters for digital finance products that align with Islamic principles. There are many debates within Shariah boards dealing with FinTech products. For example, Mukhibad *et al*. (2023) highlighted that boards consisting of individuals with Shariah knowledge, diverse experiences, and other Islamic finance backgrounds resulted in better interpretation of products and Shariah compliance, thereby fostering open innovation in Islamic banking for the introduction of more FinTech products or services into the financial markets.

The Relevant of AI For Shariah Board Assuring Shariah Compliance

Shariah boards can improve their compliance checks by using AI. Shariah boards can automate manual audit compliance procedures and standardize Shariah compliance evaluations using blockchain technology. This simplification saves time and allows Shariah boards to focus on in-depth reviews of Islamic bank operations to ensure Shariah compliance. Blockchain technology enables real-time Shariah compliance reviews, which detect non-compliance immediately and increase compliance monitoring proactivity.
In addition to blockchain, the integration of big data analytics further empowers Shariah boards through vast and swiftly evolving array of data. This capability enables dynamic and real-time analysis of extensive datasets, thereby offering a higher degree of assurance. The utility of big data analytics allowing Shariah boards to draw conclusions from a broader and more representative data population, as opposed to relying on traditional sample-based testing (Kwilinski, 2019; La Torre *et al*., 2018, 2021; Manita *et al.,* 2020).

Shariah Board Challenges in Dealing with AI

Previous research has found many obstacles for Shariah boards in ensuring Islamic banks conform with Shariah standards. A detailed study by Ullah *et al.* (2018) indicated that Islamic bank management tried to bypass Shariah boards' monitoring and audit functions, limiting their ability to defend and promote Shariah principles. These managers looked more concerned with Shariah certification for their banking products than Shariah compliance. Haridan *et al*. (2018) examined the Malaysian Islamic banking industry and found that many Shariah boards delegated compliance to internal Shariah compliance teams. Thus, Shariah boards often rubber-stamped internal department operations without oversight. Mannai and Ahmed (2019) interviewed 13 GCC Shariah boards and shared these concerns. Their findings indicated concerns about Shariah compliance categorization norms and Shariah board independence, which could pose operational risks and reduce their efficacy.

Another critical concern pertains to the establishment of Shariah parameters for the disruptive innovations of AI introduced by FinTech products and solutions. This goes beyond simply categorizing these innovations as either permissible (halal) or prohibited (haram) within Shariah. The ongoing debate about these digital financial products highlights the need to establish Shariah parameters for Islamic banking products. Islamic banks encounter numerous challenges when they endeavor to adopt new financial technology advancements driven by the integration of FinTech. These challenges include the absence of standardized regulations, concerns about data security, and a shortage of IT expertise and related skills. For instance, previous studies have highlighted the divergent opinions regarding the compatibility of digital currencies like Bitcoin and Ethereum with Shariah law (Noordin, 2018; Depietro, 2018). While some argue that the involvement of interest payments is strictly prohibited, others view investment instruments based on physical assets more favorably and disapprove of pure monetary speculation (Noordin, 2018).

Abdeldayem and Aldulaimi (2022) introduced a Shariah-compliant framework for Islamic crowdfunding, which categorizes it into four types: reward-based, donation-based, loan-based, and equity-based. However, Bakar, Rosbi, and Uzaki (2017) and Meera (2018) argue that the cryptocurrency framework is inherently devoid of intrinsic value and raises concerns of perceived injustice, thereby contradicting Shariah principles. Intriguingly, there is evidence suggesting that certain Islamic banks engage in "fatwa shopping" to obtain favorable religious rulings that support their online trading of Bitcoin FinTech (Oseni and Ali, 2019). Nonetheless, the shortage of talent among Shariah scholars is a significant concern (Garas and Pierce, 2010; Najeeb and Ibrahim, 2014; Othman and Ameer, 2015; Haridan *et al.*, 2018) for Islamic banks as they venture into the realm of digital finance products and services offered by FinTech. A similar argument is presented in a study conducted by Hassan *et al.* (2019), which reveals that subpar standards in many jurisdictions and the inadequacy of Shariah board experts in both Islamic and conventional contractual transactions. Affirming this, a survey by Poon *et al.* (2020) of Islamic banks in Bahrain and Malaysia indicated that the shortage of Islamic finance specialists has rendered the Shariah board less involved in the technical aspects of product developments. Due to this, it raises the question of what the impact of AI is on the decision-making processes and oversight functions of Shariah boards in Islamic banking, and how these boards can effectively establish and adapt Shariah parameters to ensure the compatibility of digital financial products and services with Islamic finance principles.

Conclusion and Recommendation

As the Islamic banking system continues to advance and expand, the active involvement of Shariah boards takes on even greater significance. This is due to the dynamic nature of the financial landscape, which demands continuous adaptation to ensure that Islamic banks adhere to Shariah-compliant principles. The evolving financial ecosystem requires a vigilant eye to monitor and incorporate technological innovations, including blockchain and artificial intelligence (AI), while upholding the integrity of

Islamic finance.

The integration of blockchain and AI can significantly aid Shariah boards in carrying out their crucial tasks. These technologies offer enhanced transparency and relevancy, which are vital for ensuring that financial transactions and products align with Shariah principles. Blockchain's immutable ledger, for instance, provides a secure and transparent record of all financial activities, making it easier for Shariah boards to verify compliance.

Moreover, it is imperative for Shariah boards to continually enhance their skills and competency to effectively leverage these technological advancements. This study suggests that training and development in blockchain and AI are crucial for Shariah scholars to stay abreast of the ever-evolving financial landscape. It enables them to offer informed guidance on emerging FinTech products. By staying well-versed in these technologies, Shariah boards can play a pivotal role in not only upholding Shariah compliance but also fostering innovation within Islamic banking. This ensures that the financial products and services offered remain in alignment with Islamic finance principles, thereby contributing to the growth of the industry. In light of the aforementioned advances in artificial intelligence, this study underscores the pressing need for future research to delve into the applicability of blockchain systems within the framework of Islamic banking, with a key focus on thoroughly assessing potential cyber risks. Understanding and addressing these risks is crucial for the growth of Islamic banking and ensuring unwavering adherence to Shariah compliance, especially in the face of the increasing integration of these technologies. Such a nuanced examination of cyber risks is essential to strengthen the resilience of Islamic financial institutions, safeguarding the integrity of the industry and commitment to Shariah principles.

The convergence of Islamic finance and technology, encompassing AI, is a dynamic field that has witnessed ongoing developments, perhaps leading to evolved viewpoints. Future research could investigate the extent to which AI systems can guarantee adherence to Shariah law in financial transactions. Additionally, exploring the level of trust that Shariah boards place in AI algorithms to make choices aligned with Islamic principles is a crucial area of inquiry. The scope of this study might be expanded to examine the perspectives of Shariah boards regarding the ethical and moral considerations associated with artificial intelligence. Inquiries may encompass the extent to which AI applications adhere to Islamic ideals, including but not limited to justice, fairness, and accountability.

References

AAOIFI. (1998). Accounting and Auditing Standards for Islamic Banks and Financial Institution. Manama, Bahrain: Accounting and Auditing Standards for Islamic Financial Institutions.

AAOIFI. (2010). Financial Accounting Standards. Manama, Bahrain: Accounting and Auditing Organization for Islamic Financial Institutions.

Abdeldayem, M. and Aldulaimi, S. (2022). Developing an Islamic crowdfunding model: A new innovative mechanism to finance SMEs in the Middle East. International Journal of Organizational Analysis, Vol. ahead-of-print No. ahead-of-print.

Abedifar, P. (2019). Lending, the poor, and Islamic scripture: Islamic finance versus welfare Islam. Journal of the American Academy of Religion, 87(2), pp. 460-482

Abedifar, P., Ebrahim, S.M., Molyneux, P. and Tarazi, A. (2015). Islamic banking and finance: Recent empirical literature and directions for future research. Journal of Economic Surveys, 29(4), pp. 637- 670.

Abu-Tapanjeh, A. M. (2009). Corporate governance from the Islamic perspective: A comparative analysis with OECD Principles. Critical Perspectives on Accounting, 20, pp. 556-567.

Ahamed, M. M., Mallick, S. K. (2019). Is financial inclusion good for bank stability? International evidence. Journal of Economic Behavior & Organization, 157, pp. 403-427

Alshater, M. M., Saba, I., Supriani, I. and Rabbani, M. R. (2022). Fintech in islamic finance literature: A review. Heliyon, 8(9), p. 10385.

Bakar, N.A., Rosbi, S. and Uzaki, K. (2017). Cryptocurrency framework diagnostics from Islamic finance perspective: A new insight of bitcoin system transaction. International Journal of Management Science and Business Administration, 4(1), pp. 19-28.

Banna, H., Hassan, M. K. and Rashid, M. (2021). Fintech-based financial inclusion and bank risk taking: Evidence from OIC countries. Journal of International Financial Markets, Institutions & Money, 75, p. 101447

Bougatef, K. (2015). The impact of corruption on the soundness of Islamic banks. Borsa Istanbul Review.

Bukht, T.F.N., Raza, M.A., Awan, J.H. and Ahmad, R. (2020). Analyzing cyber-attacks targeted on the Banks of Pakistan and their Solutions. International Journal of Computer Science and Network Security, 20(2).

Chapra, M. U. and Ahmed, H. (2002). Corporate governance in Islamic financial institutions. Islamic Development Bank: Islamic Research and Training Institute.

Chong, F. H. L. (2021). Enhancing trust through digital Islamic finance and blockchain technology. Qualitative Research in Financial Markets, 13(3), pp. 328-341

Daud, S. N. M., Ahmad, A. H., Khalid, A. and Azman-Saini, W. N. W. (2022). FinTech and financial stability: Threat or opportunity?. Finance Research Letters, 47, p. 102667

De Bakker, F. G. A., Rasche, A. and Ponte, S. (2019). Multi-Stakeholder Initiatives on Sustainability: A Cross-Disciplinary Review and Research Agenda for Business Ethics. Business Ethics Quarterly, 29(3), pp. 343-383.

Depietro, A. (2018). Blockchain and Islamic banking are working together, and everyone stands to benefit. The Forbes. Retrieved from https://www.forbes.com/sites/andrewdepietro/2018/07/11/blockchain-islamic-banking benefits/?sh=3586da383af2

Dowling, J. and Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. Pacific Sociological Review, 18, pp. 122-36.

Dusuki, A. W. (2008). Understanding the objectives of Islamic banking: A survey of stakeholders' perspectives. International Journal of Islamic and Middle Eastern Finance and Management, 1 (2), pp. 132-148.

Farag, H., Mallin, C. and Ow-Yong, K. (2018). Corporate governance in Islamic banks: New insights for dual board structure and agency relationships. Journal of International Financial Markets Institutions and Money, 54, pp. 59-77.

Feghali, K., Mora, N., Nassif, P. (2021). Financial inclusion, bank market structure, and financial stability: International evidence. The Quarterly Review of Economics and Finance, 80, pp. 236-257

Garas, S. N. and Pierce, C. (2010). Shari'a supervision of Islamic financial institutions. Journal of Financial Regulation and Compliance, 18(4), pp. 386-407

Ginena, K. (2014). Shariah risk and corporate governance of Islamic banks. Corporate Governance: The International Journal of Business in Society, 14(1), pp. 86-103.

Ginena, K. and Hamid, A. (2015). Foundations of Shari'ah Governance of Islamic Banks. The Wiley Finance Series.

Haridan, N. F. M., Hassan, A. F. S. and Karbhari, Y. (2018). Governance, religious assurance and Islamic banks: Do Shariah boards effectively serve? Journal of Management and Governance, 22(4), pp. 1015- 1043

Haridan, N. M., Hassan, A.F. S., Shah, S. M. and Mustafa, H. (2023). Financial innovation in Islamic banks: Evidence on the interaction between Shariah board and FinTech. Journal of Islamic Accounting and Business Research, 14(6), pp. 911-930.

Hassan, M. K., Aliyu, S., Huda, M. and Rashid, M. (2019). A survey on Islamic finance and accounting standards. Borsa Istanbul Review, 19, pp. S1-S13

Hassan, M. K., Khan, A. and Paltrinieri, A. (2019). Liquidity risk, credit risk and stability in Islamic and conventional banks. Research in International Business and Finance, 48, pp. 17-31.

IFSB-9. (2009). Guiding Principles on Conduct of Business for Institutions Offering Islamic Financial Services. Islamic Financial Services Board.

Koulu, R. (2016). Blockchains and online dispute resolution: Smart contracts as an alternative to enforcement. Journal of Law, Technology & Society, 13(1), pp. 40-69.

Kwilinski, A. (2019). Implementation of blockchain technology in accounting sphere. Academy of Accounting and Financial Studies Journal, 23, pp. 1-6.

La Torre, M., Botes, V.L., Dumay, J. and Odendaal, E. (2021). Protecting a new Achilles heel: The role of auditors within the practice of data protection. Managerial Auditing Journal, 36(2), pp. 218-239.

La Torre, M., Dumay, J. and Rea, M.A. (2018). Breaching intellectual capital: Critical reflections on big data security. Meditari Accountancy Research, 26(3), pp. 463-482.

Laldin, M. A. and Djafri, F. (2019). Islamic Finance in The Digital World: Opportunities and Challenges (Kewangan Islam dalam Dunia Digital: Peluang dan Cabaran). Journal of Islam in Asia (E-ISSN 2289- 8077), 16(3), pp. 283-299.

Lee, I. and Shin, Y. J. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. Business Horizons, 61 (1), pp. 35-46.

Lin, C.-C.; Huang, A.Y.Q.; Yang, S.J.H. (2023) A Review of AI-Driven Conversational Chatbots Implementation Methodologies and Challenges (1999–2022). Sustainability, 15, 4012. https://doi.org/ 10.3390/su15054012

Manita, R., Elommal, N., Baudier, P. and Hikkerova, L. (2020). The digital transformation of external audit and its impact on corporate governance. Technological Forecasting and Social Change, 150.

Mannai, M. A. and Ahmed, H. (2019). Exploring the workings of Shari'ah supervisory board in Islamic finance: A perspective of Shari'ah scholars from GCC. The Quarterly Review of Economics and Finance, 74, pp. 97-108.

Meera, A.K.M. (2018). Cryptocurrencies from Islamic perspectives: The case of bitcoin. Bulletin of Monetary Economics and Banking, 20(4), pp. 475-492

Mollah, S. and Zaman, M. (2015). Shari'ah supervision, corporate governance and performance: Conventional vs. Islamic banks. Journal of Banking & Finance, 58, pp. 418-435.

Muedini, F. (2018). The compatibility of cryptocurrencies and Islamic finance. European Journal of Islamic Finance, 10, pp. 1-10.

Mukhibad, H., Nurkhin, A., Anisykurlillah, I., Fachrurrozie, F. and Jayanto, P. Y. (2023). Open innovation in shariah compliance in Islamic banks – Does shariah supervisory board attributes matter?. Journal of Open Innovation: Technology, Market, and Complexity, 9, p. 100014

Najeeb, S. F. and Ibrahim, S. H. M. (2014). Professionalizing the role of Shariah auditors: How Malaysia can generate economic benefits. Pacific-Basin Finance Journal, 28, pp. 91-109.

Noordin, K.A. (2018, September 6). Islamic finance: Is cryptocurrency halal? The Edge Market. Retrieved from https://www.theedgemarkets.com/article/islamic-finance-cryptocurrency-halal.

Oseni, U.A. and Ali, S.N. (2019). Fintech in Islamic Finance: Theory and Practice. (1st ed). London: Taylor and Francis Group.

Oseni, U.A. and Omoola, S.O. (2015). Banking on ICT: The relevance of online dispute resolution in the Islamic banking industry in Malaysia. Information & Communications Technology Law, 24(2), pp. 205-223.

Othman, R. and Ameer, R. (2015). Conceptualizing the duties and roles of auditors in Islamic financial institutions: What makes them different? Humanomics, 31(2), pp. 201-213

Poon, J., Chow, Y. W., Ewers, M. and Ramli, R. (2020). The role of skills in Islamic financial innovation: Evidence from Bahrain and Malaysia. Journal of Open Innovation: Technology, Market, and Complexity, 6, p. 47

Quttainah, M.A. and Almutairi, A.R. (2016). Corporate ethics: evidence from Islamic banks. Journal of Management and Governance.

Safieddine, A. (2009). Islamic financial institutions and corporate governance: New insights for agency theory. Corporate Governance: An International Review, 17(2), pp. 142-158.

Safiullah, M., Hassan, M. K. and Kabir, M. N. (2022). Corporate governance and liquidity creation nexus in Islamic banks—Is managerial ability a channel?. Global Finance Journal, 51.

Sidaoui, M., Ben Bouheni, F., Arslankhuyag, Z. and Mian, S. (2022). Fintech and Islamic banking growth: New evidence. Journal of Risk Finance, 23(5), pp. 535-557.

Suchman, M. C. (1995). Managing legitimacy: strategic and institutional approaches. Academy of Management Review, 20, pp. 571-610.

Tajudin, M., Omar, R., Smedlund, A., Aziz, R. P. (2020). Financing with heart and intelligence: Augmenting intimacy and sustainability through Islamic fintech. International Journal of Advanced Science and Technology, 29(9s), pp. 1638-1664.

Todorof, M. (2018). Shariah-compliant FinTech in the banking industry. ERA Forum, 19, pp. 1-17.

U.S. Securities and Exchange Commission. (2022). SEC charges robo-adviser with misleading clients, February 10, available at: https://www.sec.gov/news/press-release/2022-24.

Ullah, S., Harwood, I. A. and Jamali, D. (2018). 'Fatwa repositioning': The hidden struggle for Shari'a compliance within Islamic financial institutions. Journal of Business Ethics, pp. 1-23.

Weber, M. (1978). Economy and society. Berkeley: University of California Press.

Xuesong Zhai, Xiaoyan Chu, Ching Sing Chai, Morris Siu Yung Jong, Andreja Istenic, Michael Spector, Jia-Bao Liu, Jing Yuan, Yan Li, (2021) "A Review of Artificial Intelligence (AI) in Education from 2010 to 2020", *Complexity*, vol. 2021, Article ID 8812542, 18 pages, 2021. https://doi.org/10.1155/2021/8812542

Yudaruddin, R. (2023). Financial technology and performance in Islamic and conventional banks. Journal of Islamic Accounting and Business Research, 14(1), pp. 100-116.