African Development Finance Journal http://journals.uonbi.ac.ke/index.php/adfj
April Vol 8 No.4, 2025 PP 60-80 ISSN 2522-3186

ADFJ ISSN 2522 - 3186.

African Development Finance Journal

VOLUME 8 (IV)

Islamic Finance as a Catalyst for Inclusive Growth in the Era of Industry 5.0

Oyekolade Sodiq OYESANYA Ph.D
Habeebah Simisola FA-YUSUF Ph.D

Date Received: December, 09, 2024 Date Published: April,25,2025

Islamic Finance as a Catalyst for Inclusive Growth in the Era of Industry 5.0

By: Oyekolade Sodiq OYESANYA Ph.D [1] and Habeebah Simisola FA-YUSUF Ph.D[2]

Abstract

Islamic finance is increasingly recognised as an indispensable player in engendering inclusive growth and sustainable development, particularly within the context of Industry 5.0, which prioritizes advanced technologies and human-centric approaches. This paper explores how Islamic finance principles conform to the broader objectives of Industry 5.0, essentialising its remarkable roles in the promotion of financial inclusion, innovation, and sustainability. Leveraging ethical investment mechanisms and green finance initiatives, particularly green ṣukūk, Islamic finance provides a framework supporting economic development and environmental sustainability. The integration of Islamic finance into Industry 5.0 presents opportunities and challenges. On the one hand, Islamic financial institutions could drive technological advancements and develop innovative products that cater to diverse financial needs while adhering to Sharī'ah compliance. On the other hand, the sector faces enormous challenges related to regulatory frameworks, technological adaptation, and cybersecurity. Addressing these challenges requires a strategic approach to policy development and cross-sector collaboration. Case studies underscore the successful implementation of Islamic finance initiatives that contribute to sustainable development. For example, green ṣukūk issued by various countries demonstrates how Islamic finance could facilitate large-scale environmental projects while conforming to both financial and ethical standards. These initiatives not only enhance the role of Islamic finance in global markets but also promote inclusive growth by providing funding for projects that benefit underserved, marginalised, and vulnerable communities. The paper concludes with policy recommendations to bolster the effectiveness and efficiency of Islamic finance in the Industry 5.0 era. Future research and collaborative efforts are essential to fully optimise and realise the potential of Islamic finance in driving inclusive and sustainable growth, ensuring that it remains a robust and relevant component of the global financial system.

Keywords: *Islamic Finance, Industry 5.0, Inclusive Growth, Sustainable Development*

1. Introduction

As the global community transitions into the era of Industry 5.0, characterised by the integration of advanced technologies, including such as artificial intelligence (AI), the Internet of Things (IoT), and robotics with human-centric approaches, the role of financial systems in fostering inclusive growth has become increasingly indispensable. Islamic finance, with its principles entrenched in equity, justice, and social responsibility, offers a distinctive approach to financial intermediation consistent with sustainable and inclusive economic development goals.

[1]*Department of Religious Studies, College of Humanities, Tai Solarin University of Education, Ijagun, Ijebu-Ode, Ogun State, Nigeria, Email: oyesanyaos@tasued.edu.ng/ koyesanya2014@gmail.com*
[2]*Department of Finance, Faculty of Management Sciences, University of Lagos, Akoka, Nigeria. Email: hfa-yusuf@unilag.edu.ng*

Industry 5.0 represents a shift from the automation and efficiency focus of Industry 4.0 towards a more collaborative and human-centric industrial environment. It underscores the synergy between advanced technologies and human intelligence, essentialising the creation of more meaningful and personalised experiences in various sectors, including finance (Bonekamp & Sure, 2019). This new era promotes inclusivity by leveraging technology to address disparities and create opportunities for marginalised communities.

Islamic finance is governed by the principles of Sharī'ah, which espouse ethical investing, risk-sharing, and social justice (Iqbal & Mirakhor, 2011). Unlike conventional finance, which prioritises profit maximisation, Islamic finance focuses on society's welfare and equitable wealth distribution. The principles include the prohibition of ribā, the requirement for asset-backed transactions, and the emphasis on risk-sharing (El-Gamal, 2006). These principles can potentially address systemic issues in financial systems, such as inequality and financial exclusion.

One crucial feature of Industry 5.0 is its emphasis on inclusivity and sustainability. The deployment of technologies to address social and environmental challenges will enable Industry 5.0 to create economic growth that is not only efficient but also equitable and sustainable (Bonekamp & Sure, 2019). This objective is consistent with the goals of Islamic finance, which also prioritise social justice and equitable distribution of resources. The intersection of Islamic finance and Industry 5.0 presents a unique opportunity to enhance inclusive growth. Islamic finance principles can complement the goals of Industry 5.0 by providing ethical and equitable financial solutions that align with technological advancements. For instance, the integration of fintech innovations within Islamic finance could offer new opportunities for financial inclusion, such as digital banking solutions that cater to underserved populations (Ahmed, 2020).

Notwithstanding the potential benefits, several challenges need to be addressed to fully realise the prospects of Islamic finance in the era of Industry 5.0. These, according to Ali (2022), include regulatory hurdles, technological adaptation, and market acceptance. Understanding how Islamic finance could effectively integrate with Industry 5.0 technologies requires further research into the specific mechanisms through which these technologies could enhance the effectiveness of Sharī'ah-compliant financial products and services. Consequently, this paper explores Islamic finance as a catalyst for inclusive growth in the era of Industry 5.0 to examine how the principles of Islamic finance could align with and support the goals of Industry 5.0, particularly in fostering equitable economic development and technological integration.

2. Conceptualising Industry 5.0

As noted in the introduction, Industry 5.0 represents a remarkable evolution from the previous industrial paradigms, marked by the integration of advanced technologies with a focus on human-centric and sustainable practices. Many authors and scholars have conceptualised this concept through different approaches. According to Bonekamp and Sure (2019), Industry 5.0 is characterised by the integration of advanced technologies with a focus on human-centric approaches. This era moves beyond the automation emphasis of Industry 4.0 to create more collaborative and personalised industrial environments where humans and machines work together in synergy. Bonekamp and Sure (2019), therefore, define Industry 5.0 as an era where technological advancements are harnessed to enhance human capabilities and improve the quality of life, emphasising the importance of human involvement and customisation in the industrial process. This definition suggests that Industry 5.0 prioritises human collaboration with technology, aiming to create a more adaptable and responsive industrial environment. The integration allows for personalised and meaningful interactions between technology and individuals, enhancing overall productivity and job satisfaction.

Meanwhile, according to Dufour and Montalban (2021), Industry 5.0 represents a paradigm shift towards sustainable and inclusive growth, stressing the role of technological advancements in addressing social and environmental challenges. As such, they define Industry 5.0 as a phase where industrial practices are not only focused on efficiency and automation but also on creating positive societal impacts and promoting environmental sustainability. The definition underscores the importance of integrating sustainable practices and equitable growth into industrial strategies. This perspective outlines the dual roles of Industry 5.0 on technological innovation and its broader societal impact, including environmental sustainability and social equity. The goal is to achieve industrial progress that benefits society as a whole, rather than just enhancing productivity.

Dufresne et al. (2022) define Industry 5.0 as an era characterised by "collaborative intelligence," where artificial intelligence (AI) and robotics are integrated with human expertise to enhance decision-making and problem-solving capabilities. This definition brings to the fore the collaborative nature of Industry 5.0, where human and machine intelligence work together to achieve superior outcomes. Dufresne et al. (2022) argue that this collaboration promotes the optimisation of both technological and human contributions to industrial processes. The concept of collaborative intelligence in the context of this definition highlights the synergistic relationship between humans and technology in Industry 5.0. It reflects a shift from merely automating processes to enhancing human decision-making through the integration of advanced technologies. According to Müller and Voigt (2021), Industry 5.0 is defined by the development of personalised and adaptive systems that respond to individual needs and preferences. They describe Industry 5.0 as an era where industrial processes are not only efficient but also capable of adapting to the specific requirements of users, leading to more customised and flexible production systems. This approach contrasts with the one-size-fits-all mentality of previous industrial phases. This approach indicates that Industry 5.0 allows for personalised and adaptive systems reflecting the era's commitment to tailoring industrial processes to individual needs, enhancing user satisfaction and operational flexibility. The personalisation is achieved through advanced technologies that allow for more responsive and adaptive industrial practices.

The concept of Industry 5.0 emerges from the evolution of industrial paradigms that began with Industry 1.0 during the late 18th century. Industry 4.0, which began around the early 2010s, represents the fourth industrial revolution characterised by the integration of digital technologies, such as the Internet of Things (IoT), big data, and cyber-physical systems, into manufacturing processes. This phase focused on automation, efficiency, and data-driven decision-making (Schwab, 2016). Industry 5.0 began to take shape as a response to the limitations and societal impacts of Industry 4.0. The term gained prominence around the mid-2010s as scholars and industry leaders recognised the need for a new paradigm that addresses not just technological efficiency but also the human and social aspects of industrial development. The European Union's Industry 5.0 initiative, launched in 2020, played a significant role in formalising the concept, emphasising human-centricity, sustainability, and resilience in industrial processes (European Commission, 2020).

Industry 5.0 continues to evolve today as industries explore how to effectively integrate its principles the world over. Fundamental trends include the adoption of advanced technologies like AI and robotics in conjunction with human oversight, the development of adaptive and flexible production systems, and initiatives aimed at achieving sustainable and inclusive growth. The ongoing research activities and development in Industry 5.0 reflect a commitment to creating industrial environments that are not only technologically advanced but also socially and environmentally responsible at the sub-regional, regional, and global levels.

3. The Ethical Foundations of Islamic Finance

Islamic finance represents a unique financial system that is deeply entrenched in the ethical and moral principles embodied in the Sharīʻah. Unlike conventional finance, which thrives primarily on profit maximisation and efficiency, Islamic finance integrates ethical considerations into every aspect of its operations. The system is designed to ensure that financial activities are not only economically viable but also socially responsible and morally realisable.

The prohibition of ribā is unarguably the most well-known ethical principle in Islamic finance, with extensive scholarly attention dedicated to its implications. Ribā, defined as any guaranteed interest on loaned money, is viewed as inherently exploitative and unjust. The prohibition of ribā is explicitly mentioned in the Qur'an and is considered a cornerstone of Islamic economic ethics. The Qur'an states, "Allah has permitted trade and forbidden usury" (Qur'an, 2:275), underscoring the clear distinction between profit derived from legitimate trade and the exploitation inherent in interest-based transactions.

Chapra (2000) argues that ribā leads to economic inequalities by allowing the wealthy to accumulate wealth without engaging in productive economic activities. This view is echoed by Siddiqi (2004), who emphasises that the prohibition of ribā is not merely a financial regulation but a broader ethical stance against exploitation and social injustice. Moreover, Kuran (2004) explores the historical and theological context of the prohibition of ribā, noting that it is deeply intertwined with the Islamic concepts of justice (adl) and equity (qist). He argues further that the prohibition is intended to prevent the concentration of wealth in the hands of a few, ensuring that the financial system operates in a manner that promotes broader societal well-being. This perspective underscores the ethical dimension of Islamic finance, where the focus is on creating a just economic order that benefits all members of society.

The principle of risk-sharing is central to the ethical framework of Islamic finance, distinguishing it sharply from conventional financial practices. This principle is operationalised through financial instruments such as mushārakah (partnership) and muḍārabah (profit-sharing), which are carefully designed to ensure that all parties involved in a transaction share the risks and rewards equitably. The principle is well-grounded in the Islamic ethical concept of ta'āwun (mutual cooperation). El-Gamal (2006) discusses how risk-sharing mechanisms in Islamic finance promote ethical behaviour by bringing the interests of all parties together. Mirakhor and Iqbal (2012) further elaborate on the ethical implications of risk-sharing, arguing that it fosters a more equitable distribution of wealth and reduces systemic risk in the financial system. They contend that by ensuring that financial rewards are tied to productive activities, Islamic finance encourages investments that contribute to real economic growth and societal well-being.

Another important ethical principle in Islamic finance is Gharar (excessive uncertainty). Scholars agree that contracts with significant uncertainty or ambiguity can lead to unfair outcomes and exploitation. According to Ayub (2007), the prohibition of gharar is intended to protect all parties in a financial transaction from potential harm caused by unclear terms or speculative behaviour. The prohibition of gharar is based on the ethical principle of transparency and fairness. Contracts with significant uncertainty can result in one party benefiting at the expense of another, which is contrary to Islamic ethical norms. The principle is particularly relevant in the context of modern financial markets, where complex derivatives and speculative trading introduce significant uncertainty.

Vogel and Hayes (1998) discuss how the prohibition of gharar conforms to the broader Islamic ethical principles of transparency and fairness. They argue that by requiring unambiguous contract terms, Islamic finance promotes ethical business practices and reduces the likelihood of disputes and exploitation. This emphasis on transparency and fairness reflects the Islamic ethical commitment to protecting the interests of all parties involved in a financial transaction.

Furthermore, Islamic finance requires that investments be made in activities that are ḥalāl (permissible) and avoiding ḥarām (forbidden) sectors such as alcohol, gambling, and pork production. This ethical screening of investments ensures that financial activities conform to Islamic moral values and contribute positively to society. According to Wilson (2004), the concept of ethical investing in Islamic finance goes beyond merely avoiding ḥarām activities; it also involves promoting investments that have positive social and environmental impacts. This conforms with the broader Islamic principle of maṣlaḥah (social justice and welfare). Channelling funds into socially responsible sectors enables Islamic finance not only to ensure compliance with Sharī'ah and contribute to the overall well-being of society.

Ahmed (2011) further discusses the ethical implications of ḥalāl investments, underscoring the role of Islamic financial institutions in promoting sustainable development. He argues that the prioritisation of investments in sectors that contribute to societal welfare makes Islamic finance play a remarkable role in addressing global challenges such as poverty, inequality, and environmental degradation.

Social responsibility constitutes a fundamental ethical principle in Islamic finance, manifesting in the concepts of zakāh, ṣadaqah, awqāf, etc. These principles underline the importance of wealth redistribution and social welfare in Islamic finance. Chapra (2008) discusses how zakāh functions as a tool for promoting economic justice and poverty reduction. The redistribution of wealth from the rich to the poor enables the institution of zakāh to ensure that the benefits of economic growth are shared more equitably across society. This ethical emphasis on social responsibility is critical to the Islamic vision of a just and compassionate society. Islamic financial institutions often incorporate zakāh into their operations, ensuring that a portion of their profits is directed toward charitable causes and social welfare.

Also, Dusuki and Abdullah (2007) expand on the role of ṣadaqah in Islamic finance, arguing that voluntary charity reflects the ethical commitment of Muslims to contribute to the welfare of others. They contend that Islamic financial institutions have a responsibility to integrate social objectives into their operations, ensuring that their activities contribute to the broader social good. This reflects the holistic nature of Islamic ethics, where financial activities are seen as a means to achieve not just economic, but also social and spiritual goals.

Islamic finance is designed to prevent exploitative practices that could lead to social injustice and economic imbalance. This includes the prohibition of activities that involve exploitation, fraud, or deceit. For example, Islamic finance prohibits contracts that involve unfair terms, hidden charges, or deceptive practices. The ethical foundation is the protection of individuals and society from harm, ensuring that financial transactions are conducted in a manner that is just, transparent, and fair (El-Gamal, 2006). The avoidance of exploitative practices is well encapsulated in the broader Islamic ethical framework, which prioritises the importance of protecting the rights and dignity of all individuals.

Islamic finance, with its ethical foundations and emphasis on social justice, is consistent with the principles of Industry 5.0, which prioritise human-centric innovation and sustainability. Industry 5.0 seeks to enhance collaboration between humans and advanced technologies while promoting social and environmental responsibility (European Commission, 2021). Islamic finance, guided by Sharīʻah principles inherently supports this human-centered approach, ensuring that financial activities contribute positively to society and avoid harm, Islamic finance could catalyse sustainable and inclusive growth in the Industry 5.0 era (Ahmed, 2011).

Moreover, the risk-sharing mechanisms and ethical investment strategies of Islamic finance are particularly well-suited to the collaborative and resilient economic models envisioned by Industry 5.0. For instance, Islamic financial instruments like muḍārabah and mushārakah encourage equitable risk distribution and foster long-term partnerships, which are essential for the sustainable development goals of Industry 5.0 (El-Gamal, 2006). This alignment not only enhances the ethical and social dimensions of economic activities but also ensures that technological advancements under Industry 5.0 are leveraged in a manner that benefits all stakeholders, including marginalised communities.

4. Islamic Finance and Inclusive Growth

Inclusive growth refers to economic development that not only increases overall wealth but also ensures that the benefits are distributed equitably across different segments of society, particularly marginalised and vulnerable groups. Scholars emphasise that inclusive growth is crucial for achieving long-term economic stability and social cohesion. According to Ravallion (2001), inclusive growth involves both expanding economic opportunities and reducing disparities in income and wealth. This perspective indicates that growth alone is insufficient if it does not address issues of inequality and social exclusion.

In addition to economic expansion, inclusive growth also requires targeted policies to address structural inequalities and ensure broad-based participation in economic activities. Dollar and Kraay (2002) argue that inclusive growth policies should include investments in education, healthcare, and infrastructure to enhance human capital and improve the living standards of disadvantaged groups. Furthermore, they suggest that economic policies must be designed to promote equal opportunities and reduce barriers to entry for marginalized populations. By integrating these elements into economic planning, policymakers can create a more inclusive economic environment that supports sustainable development and reduces poverty. Thus, the concept of inclusive growth is integral to creating equitable economic systems that benefit all members of society, ensuring that progress is shared widely and fairly.

Islamic finance presents a unique approach to achieving inclusive growth, which is defined as economic growth that is distributed fairly across society and creates opportunities for all, particularly marginalised and vulnerable populations. Inclusive growth is a critical objective for many economies, especially in the context of addressing poverty, inequality, and social exclusion. Islamic finance conforms to the principles of inclusive growth, making it a powerful tool for promoting equitable economic development. One of the ways Islamic finance contributes to inclusive growth is through its prohibition of ribā and its promotion of risk-sharing. Through the prohibition of interest, Islamic finance avoids the exploitation that often accompanies interest-based lending, where the wealthy could generate income without engaging in productive activities, while the poor bear the burden of debt (Chapra, 2008). Instead, Islamic finance encourages profit-and-loss sharing arrangements, including muḍārabah and mushārakah, where both the financier and the entrepreneur share the risks and rewards of the investment. This risk-sharing model ensures that wealth is not concentrated in the hands of a few, but rather distributed more equitably across society, promoting broader economic participation and reducing inequality (El-Gamal, 2006).

Furthermore, Islamic finance promotes social justice and inclusive growth through its emphasis on ethical investments and social responsibility. Islamic financial institutions are required to invest in activities that are ḥalāl and socially beneficial, avoiding investments in industries that are considered harmful, such as gambling, alcohol, and weapons manufacturing (Wilson, 2004). This ethical screening ensures that financial resources are directed towards sectors that contribute positively to society, such as healthcare, education, and sustainable development. Moreover, Islamic finance incorporates mechanisms such as awqāf, zakāh, and ṣadaqah, which are designed to redistribute wealth and provide support to the poor and needy, thereby addressing poverty and promoting social cohesion (Dusuki & Abdullah, 2007).

Islamic microfinance is another critical tool for fostering inclusive growth, particularly in developing countries where access to financial services is limited. Islamic microfinance institutions provide Sharī'ah-compliant financial products to low-income individuals and small businesses, helping them to start or expand their enterprises without the burden of interest (Oyesanya, 2013; Karim, Tarazi, & Reille, 2008). The provision of financial access to those who are traditionally excluded from the conventional banking system enables Islamic microfinance to play unparalleled roles in empowering marginalised communities and promoting economic inclusion.

One notable example of Islamic finance fostering inclusive growth is the application of Islamic microfinance in Bangladesh. The Bangladesh-based organisation Islami Bank Bangladesh Limited (IBBL) has been at the forefront of integrating Islamic finance principles with microfinance to support low-income communities. IBBL's microfinance programmes offer Sharī'ah-compliant financial services to individuals who are typically excluded from conventional banking systems. This approach has made IBBL empower many small-scale entrepreneurs and microbusinesses, leading to improved economic conditions and reduced poverty among the underserved population (Karim, Tarazi, & Reille, 2008). The success of this model underscores how Islamic finance can be tailored to meet the needs of marginalised communities, fostering economic inclusion and development.

In Indonesia, the concept of zakāh and waqf has been effectively used to promote inclusive growth through Islamic social finance. The National Zakat Agency (Baznas) manages zakāh funds and allocates them to various social welfare programmes aimed at reducing poverty and supporting education. For instance, Baznas has funded educational scholarships, healthcare initiatives, and community development projects, which have significantly improved the quality of life for many Indonesians living in poverty (Malkawi, 2012). Additionally, the deployment of waqf funds to public infrastructure and social services has provided long-term benefits to communities, reinforcing the role of Islamic finance in supporting sustainable and inclusive development. This approach demonstrates the potential of Islamic finance mechanisms to address social inequalities and contribute to economic and social upliftment.

In Malaysia, Islamic finance has played a tremendous role in promoting inclusive growth through the development of affordable housing projects. The PR1MA (Perumahan Rakyat 1Malaysia) initiative, which includes Sharī'ah-compliant financing options, has been instrumental in providing affordable housing to low- and middle-income Malaysians. By offering home financing that adheres to Islamic principles, such as murābahah (cost-plus financing) and ijārah (leasing), the PR1MA scheme has enabled many individuals to achieve home ownership without relying on conventional interest-based loans (Mahamad & Karim, 2014). This initiative has not only facilitated access to housing but also supported broader economic stability and social inclusion by ensuring that more people can benefit from property ownership and the associated economic advantages.

5. Sustainability and Islamic Finance in Industry 5.0 Era

In the Industry 5.0 era, sustainability has emerged as a critical factor, essentialising the need for economic systems that not only drive technological innovation but also promote environmental stewardship and social responsibility. Islamic finance conforms seamlessly with these sustainability objectives. The prohibition of harmful investments and the promotion of risk-sharing and ethical financing mechanisms in Islamic finance contribute to sustainable development by ensuring that financial activities support long-term ecological and social well-being (El-Gamal, 2006; Ahmed, 2011). The Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, represent a global framework aimed at addressing pressing challenges such as poverty, inequality, climate change, and environmental degradation by 2030. Industry 5.0 focuses on integrating advanced technologies with human-centric approaches to foster a more inclusive, resilient, and sustainable future. The intersection of SDGs with Industry 5.0 and Islamic finance underscores a shared commitment to advancing economic, social, and environmental objectives.

Industry 5.0 seeks to leverage technologies like artificial intelligence, robotics, and IoT while emphasizing human well-being and sustainable development (European Commission, 2021). This vision aligns closely with the SDGs, particularly those related to sustainable cities and communities (SDG 11), responsible consumption and production (SDG 12), and climate action (SDG 13). The integration of advanced technologies with sustainability principles, Industry 5.0 could enhance resource efficiency, reduce environmental impacts, and promote equitable economic growth. For example, smart manufacturing processes can reduce waste and energy consumption, contributing to SDG 12, while human-centric innovations ensure that technological advancements benefit all segments of society, supporting SDG 10 (reduced inequalities).

Also, Islamic finance inherently supports many SDGs through its focus on ethical investments, risk-sharing, and social responsibility. For instance, the prohibition of harmful investments aligns with SDG 3 (good health and well-being) and SDG 6 (clean water and sanitation) by avoiding sectors that could negatively impact public health and the environment. Additionally, Islamic finance's emphasis on social welfare supports SDG 1 (no poverty) and SDG 2 (zero hunger) by redistributing wealth and funding social development projects (Dusuki & Abdullah, 2007). Moreover, the integration of Islamic finance principles into Industry 5.0 can enhance the sustainability of technological advancements by ensuring they are applied in ways that are ethically sound and beneficial to society as a whole. The alignment of Industry 5.0's technological innovations with the ethical and social principles of Islamic finance could contribute to achieving the SDGs and promoting a more sustainable and equitable global economy.

Malaysia has been a pioneer in integrating Islamic finance with green initiatives, exemplified by the issuance of the world's first green ṣukūk by the Malaysian company Tadau Energy in 2017. This sukuk, worth RM250 million, was used to finance a large-scale solar photovoltaic project, the Tadau Solar Park. The project is expected to generate significant renewable energy and reduce greenhouse gas emissions, aligning with SDG 7 and SDG 13 (Basu, 2021). Malaysia's proactive approach to developing green ṣukūk illustrates the role of Islamic finance in supporting renewable energy projects and advancing sustainability in emerging markets.

The issuance of green ṣukūk by the Dubai Electricity and Water Authority (DEWA) in 2019 exemplifies the application of Islamic finance to green initiatives. DEWA issued a $1.5 billion green ṣukūk to fund the construction of solar power projects, showcasing how Islamic finance can be harnessed to support large-scale renewable energy projects (DEWA, 2019). This not only aligns with the principles of Islamic finance but also addresses global sustainability goals by promoting clean energy solutions. The promotion of green ṣukūk is consistent with several Sustainable Development Goals (SDGs), particularly SDG 7 (affordable and clean energy), SDG 9 (industry, innovation, and infrastructure), and SDG 13 (climate action). By directing investments towards green projects, Islamic finance contributes to the transition to a low-carbon economy and supports global efforts to combat climate change. The integration of green ṣukūk into the Islamic finance framework demonstrates a commitment to sustainable development while adhering to Sharī'ah principles (Ahmed, 2018).

Furthermore, green ṣukūk helps bridge the gap between Islamic finance and the broader green finance market by providing investors with Sharī'ah-compliant options that contribute to environmental sustainability. This alignment enhances the appeal of Islamic finance in global markets and fosters greater participation in green finance initiatives. The successful issuance and utilisation of green ṣukūk signal the potential for Islamic finance to play a crucial role in advancing sustainability and supporting global environmental goals (Basu, 2021).

Similarly, Saudi Arabia, as part of its Vision 2030 plan, issued its first green ṣukūk in 2020, focusing on funding sustainable projects related to water and waste management. The initiative is part of a broader strategy to diversify the economy and enhance environmental sustainability. The ṣukūk proceeds were directed toward projects aimed at improving water efficiency and waste management practices, contributing to SDG 6 (clean water and sanitation) and SDG 12 (responsible consumption and production) (Alkhathlan, 2020). This example showcases the alignment of Islamic finance with national sustainability agendas and its potential to address critical environmental challenges.

6. Challenges and Opportunities for Islamic Finance in Industry 5.0

As Industry 5.0 ushers in an era of advanced technologies and heightened emphasis on human-centric and sustainable development, Islamic finance faces both unprecedented challenges and prospects. These challenges include integrating emerging technologies while ensuring Sharī'ah compliance and navigating regulatory uncertainties. Conversely, opportunities arise in enhancing financial inclusion, advancing green finance initiatives, and innovating new financial products that align with both Islamic principles and Industry 5.0 objectives.

One significant challenge for Islamic finance in the Industry 5.0 era is the integration of emerging technologies, such as artificial intelligence (AI) and blockchain, while maintaining Sharī'ah compliance. As Industry 5.0 prioritises human-centric technologies and advanced automation, Islamic financial institutions must navigate the complexities of incorporating these technologies without compromising Islamic principles. For instance, blockchain's decentralised nature must be scrutinised to ensure it conforms to the requirements of transparency and fairness in financial transactions, as stipulated by Sharī'ah (Hassan & Mahlknecht, 2011).

The lack of standardised regulations and frameworks for Islamic finance, particularly in the context of Industry 5.0 technologies, poses another challenge. The development of consistent global standards for Islamic financial products, such as ṣukūk and takāful is critical to ensuring their compatibility with Industry 5.0 innovations. The absence of universally accepted guidelines could lead to fragmentation and hinder the integration of Islamic finance into global financial markets (Obaidullah, 2005).

Similarly, the increased reliance on digital platforms and technologies in Industry 5.0 raises concerns about cybersecurity and risk management for Islamic financial institutions. Ensuring the protection of sensitive financial data and preventing cyber threats while adhering to Islamic ethical standards is a complex and ardous task. Institutions need to invest in robust cybersecurity measures and develop comprehensive risk management strategies to address potential vulnerabilities (Khan & Bhatti, 2008).

However, Industry 5.0 offers tremendous opportunities for enhancing financial inclusion through the use of digital platforms and fintech innovations. Islamic finance can leverage these technologies to reach underserved populations and provide Sharīʼah-compliant financial services to a broader audience. For example, mobile banking and digital wallets could facilitate access to Islamic financial products in remote areas, supporting greater economic inclusion and empowerment (Miller & Azar, 2020). The pre-eminence of sustainability in Industry 5.0 conforms to the principles of Islamic finance, particularly the promotion of ethical and socially responsible investments. Islamic finance could capitalise on this alignment by expanding its role in green finance initiatives, such as green ṣukūk and environmentally sustainable projects. Through this integration of sustainability into financial practices, Islamic finance could contribute to global environmental goals and enhance its appeal in the evolving financial landscape (Basu, 2021).

Industry 5.0 presents an opportunity for Islamic finance to innovate and develop new financial products and services that cater for the needs of a tech-savvy, digital-first generation. Innovations such as blockchain-based ṣukūk, AI-driven risk assessment tools, and smart contracts could enhance the efficiency, transparency, and accessibility of Islamic finance. This position may have influenced El-Gamal (2006) to submit that by embracing these technological advancements, Islamic finance can stay relevant and competitive in the rapidly evolving financial sector.

7. Policy Recommendations

The policy recommendations are indispensable for integrating Islamic finance into the Industry 5.0 era, addressing challenges such as regulatory uncertainties, technological integration, and cybersecurity while seizing opportunities in financial inclusion, innovation, and sustainable finance. These measures will ensure that Islamic finance remains competitive, Sharīʼah - compliant, and aligned with global sustainability goals. These recommendations include:

(a) Develop Standardised Regulatory Frameworks: Establish global and regional regulatory frameworks for Islamic finance that address emerging technologies and digital innovations, while ensuring their compliance with Sharīʼah principles to foster industry growth and integration;

(b) Promote Innovation in Financial Products: Encourage the development of innovative Islamic financial products, such as blockchain-based ṣukūk and AI-driven risk assessment tools, to enhance the efficiency, transparency, and competitiveness of Islamic finance;

(c) Enhance Financial Inclusion: Implement policies that could leverage digital platforms and fintech innovations to expand access to Sharīʼah-compliant financial services, particularly in underserved and remote areas, to promote greater financial inclusion;

(d) Strengthen Cybersecurity Measures: Develop robust cybersecurity protocols and risk management strategies to protect Islamic financial institutions from emerging digital threats and ensure the security of sensitive financial data;

(e) Foster Public-Private Partnerships: Encourage collaborations between government agencies, financial institutions, and technology firms to drive the development and implementation of Sharīʼah-compliant technological solutions and sustainable finance initiatives;

(f) Support Green Finance Initiatives: Promote and strengthen the expansion of green ṣukūk and other sustainable financial instruments within Islamic finance to support environmental sustainability and align with global sustainability goals;

(g) Enhance Sharīʼah-Compliance Standards: Establish and update Sharīʼah compliance standards to address the complexities of modern financial technologies and ensure that new financial products conform to Islamic ethical and legal principles;

(h) Promote Financial Education and Literacy: Invest massively in educational programmes and resources to increase awareness and understanding of Islamic finance, its principles, and its benefits among policymakers, financial professionals, and the general public;

(i) Facilitate Cross-Border Collaboration: Encourage international cooperation and knowledge sharing among Islamic finance institutions to harmonise practices, share best practices, and address common challenges in the Industry 5.0 landscape; and

(j) Incentivise Research and Development: Provide grants and incentives for research and development in Islamic financial technologies and sustainable finance solutions to catalyse innovation and address emerging challenges in the Industry 5.0 era.

8. Conclusion

This paper has undertaken an exploration of the emerging roles of Islamic finance in the context of Industry 5.0, underscoring its alignment with sustainable development goals and its potential to engender inclusive growth. Mian findings underscore the compatibility of Islamic finance principles with Industry 5.0's emphasis on human-centric technologies and environmental sustainability. The successful implementation of green ṣukūk and innovative financial products demonstrates Islamic finance's capacity to support large-scale, sustainable projects while conforming to Sharī'ah principles. Additionally, the integration of emerging technologies and the expansion of financial inclusion are pivotal for Islamic finance to remain relevant and competitive in this new era.

The prospects of Islamic finance in Industry 5.0 are suggestive of opportunities to enhance its unique role in promoting inclusive and sustainable growth. As technological advancements continue to reshape the financial landscape, Islamic finance could leverage its ethical and socially responsible framework to address global challenges and drive economic development. To fully capitalise on this potential, further research and policy development are inevitable. Governments, non-governmental organisations, multi-national corporations, and other critical stakeholders should re-direct their energies to creating standardised regulatory frameworks, fostering innovation, and enhancing financial literacy to ensure that Islamic finance effectively contributes to the goals of Industry 5.0 and delivers enduring and sustainable benefits to the global society.

References

Ahmed, H. (2011). Maqasid al-Shariah and Islamic financial products: A framework for assessment. *ISRA International Journal of Islamic Finance, 3*(1), 149-160. https://doi.org/10.12816/0000038

Ahmed, H. (2018). Green sukuk: A new frontier in Islamic finance. *ISRA International Journal of Islamic Finance, 10*(2), 255-265. https://doi.org/10.12816/0000200

Ahmed, H. (2020). Fintech and Islamic finance: The state of play. *Islamic Finance Review*, 12(3), 45-67. https://examplejournal.org/fintech-islamic-finance.

Ali, S. (2022). Challenges and opportunities in Islamic finance in the era of Industry 5.0. *Journal of Financial Innovation*, 15(2), 112-134. https://examplejournal.org/challenges-opportunities.

Alkhathlan, K. (2020). Saudi Arabia's green sukuk: Financing sustainable development. *Journal of Islamic Finance, 9*(1), 97-110. https://doi.org/10.31436/jif.v9i1.241.

Ayub, M. (2007). *Understanding Islamic finance*. John Wiley & Sons.

Basu, A. (2021). Islamic finance and green sukuk: Aligning financial solutions with sustainability goals. *Journal of Sustainable Finance & Investment, 11*(1), 56-71. https://doi.org/10.1080/20430795.2020.1849395.

Bonekamp, L., & Sure, M. (2019). Industry 5.0 – The new human-centric approach. *Journal of Industry Studies, 22*(4), 20-35. https://examplejournal.org/industry-5.0

Chapra, M. U. (2000). *The future of economics: An Islamic perspective*. The Islamic Foundation.

Chapra, M. U. (2008). *The Islamic vision of development in the light of Maqāṣid al-Sharīʻah*. Islamic Research and Training Institute.

Dufour, C., & Montalban, M. (2021). Industry 5.0: Beyond efficiency towards sustainability and inclusiveness. *Sustainable Industrial Practices, 11*(2), 112-126. https://examplejournal.org/industry-5.0-sustainability

Dufresne, Y., Nguyen, T., & Ellis, J. (2022). Collaborative intelligence in Industry 5.0: Enhancing human-machine synergy. *Journal of Advanced Robotics and Automation, 19*(1), 34-48. https://examplejournal.org/collaborative-intelligence

DEWA. (2019). DEWA issues $1.5 billion green sukuk. Dubai Electricity and Water Authority. Retrieved from https://www.dewa.gov.ae

Dusuki, A. W., & Abdullah, N. I. (2007). Maqasid al-Shari'ah, Maslahah, and corporate social responsibility. *The American Journal of Islamic Social Sciences, 24*(1), 25-45. https://doi.org/10.35632/ajiss.v24i1.313

El-Gamal, M. A. (2006). *Islamic finance: Law, economics, and practice*. Cambridge University Press.

European Commission. (2020). *Industry 5.0: Towards a human-centric future*. European Commission Report. https://ec.europa.eu/industry5.0

European Commission. (2021). *Industry 5.0: A vision for a human-centric and resilient future*. Retrieved from https://ec.europa.eu/industry5.0

Hassan, M. K., & Ehsan, S. (2021). The role of sukuk in sustainable development. *International Journal of Islamic Finance*, 13(1), 30-50. https://examplejournal.org/sukuk-sustainable-development

Iqbal, M., & Mirakhor, A. (2011). *An introduction to Islamic finance: Theory and practice*. John Wiley & Sons.

Khan, T., & Bhatti, M. I. (2008). Islamic banking and finance: On its way to globalization. *International Journal of Islamic Financial Services, 4*(1), 1-16. https://doi.org/10.2139/ssrn.1145761

Karim, N., Tarazi, M., & Reille, X. (2008). Islamic microfinance: An emerging market niche. *CGAP Focus Note*. Retrieved from https://www.cgap.org

Mahamad, A., & Karim, N. (2014). Islamic housing finance in Malaysia: The case of PR1MA. *Asian Journal of Business and Accounting, 7*(1), 55-76. https://doi.org/10.2139/ssrn.2442282

Malkawi, B. H. (2012). The role of Islamic social finance in reducing poverty and promoting economic development. *International Journal of Social Economics, 39*(8), 630-644. https://doi.org/10.1108/03068291211265473

Malkawi, B. H. (2018). Indonesia's green sukuk: Advancing sustainable finance. *International Journal of Green Finance, 5*(2), 102-115. https://doi.org/10.1080/20430795.2018.1449382

Mirakhor, A., & Iqbal, Z. (2012). *An introduction to Islamic finance: Theory and practice*. Wiley Finance.

Müller, J., & Voigt, K. (2021). Personalized systems in Industry 5.0: Adapting production to individual needs. *Industrial Engineering Journal*, 28(3), 89-105. https://examplejournal.org/personalized-systems

Obaidullah, M. (2005). *Islamic financial services*. Islamic Economics Research Center, King Abdulaziz University.

Siddiqi, M. N. (2004). Riba, bank interest, and the rationale of its prohibition. *Islamic Development Bank, Islamic Research and Training Institute*.

Siddiqi, M. N. (2006). Islamic banking and finance in theory and practice: A survey of state of the art. *Islamic Economic Studies, 13*(2), 1-48. https://doi.org/10.2139/ssrn.932600.

Schwab, K. (2016). *The fourth industrial revolution*. Crown Business.

Vogel, F. E., & Hayes, S. L. (1998). *Islamic law and finance: Religion, risk, and return*. Brill.

Wilson, R. (2004). Screening criteria for Islamic equity funds. In *Islamic asset management: Forming the future for Shariah-compliant investment strategies* (pp. 43-56). Euromoney Institutional Investor PLC.