



RESEARCH ARTICLE

The Role of Green Financing in Transforming Financial Institutions in Saudi Arabia: A Focus on ESG Innovations

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ABSTRACT

The contribution investigates the transformation role that green finance can play in evolving Saudi Arabia's financial institutions, putting particular emphasis on how ESG issues act as innovation drivers for business development. It is underlined that the goals of the strategy undertaken by Saudi banks with green finance also agree with Saudi Vision 2030, which calls for a more sustainable economy with greater diversification. The significant momentum looks more precisely at new issues of Green Bonds and Sukuk, developing ESG investing themes, and also building regulatory sustainable finance frameworks as it looks over this period from 2020 into 2024. It carries case studies of top Saudi financial players like Al Rajhi Bank and Saudi National Bank, leading from the front in issuing green sukuk and integrating ESG. This review also looks at different regulatory initiatives by the Saudi Arabian Monetary Authority-or SAMA-and the Capital Market Authority to ascertain their eventual effects on green financing and ensuring ESG compliance. These findings actually reflect that much has been done, yet the standardization of ESG reporting frameworks is still incomplete, and there is still a shortage of experts in the area of sustainable finance. It also explores how technology, such as blockchain and artificial intelligence, could be applied to introduce more transparency and efficiency, supporting ESG-related decision-making. This development has presented opportunities to fill unmet needs of the past and catch up with international standards of sustainability. These findings confirm that capacity building, regulatory cooperation, and technological innovation are crucial in making the environment viable for sustainable finance to thrive in Saudi Arabia. This research contributes to a better understanding of how green finance can reshape financial institutions and give realistic recommendations to policymakers and industry players in the pursuit of long-term sustainability objectives. Closing gaps in ESG reporting, arising from emerging technologies, will place Saudi Arabia's financial sector in a leading position in the global transition toward sustainable finance.

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INTRODUCTION

Green finance has increasingly emerged as a critical tool for ensuring environmental concerns and achieving sustainable development within varied sectors. It refers to financial resource allocations to programs and projects with good environmental and social impact. This is in line with Saudi Arabia's Vision 2030, aimed at reshaping the economic structure of the country by infusing sustainability into its financial ecosystem and diversifying away from its reliance on oil earnings. Alqahtani (2021) affirms that financial institutions within the Kingdom have been implementing ESG practices to attract international capital and construct strong economic structures.

The demand for practical sustainability from global investors has given more traction to the problems of ESG. Judging by recent research, the integration of ESG considerations into financial decision-making raises the degree by Khan et al. (2022). The Saudi National Bank and Riyadh Bank were among the institutions that introduced ESG-compliant funds into the market in response to this

growing interest. This shift has been encouraged by the government of Saudi Arabia through policies supportive of green financing and ESG reporting (SAMA, 2022). However, a lack of awareness about ESG principles, the non-existence of standardized ESG frameworks, and capacity constraints are significant impediments to broad-based diffusion.

The paper looks at the role of green financing in transforming Saudi financial institutions by investigating the introduction of ESG-focused instruments, exploring regulatory efforts toward institutionalizing sustainability practices, and discussing challenges and opportunities that define this dynamic landscape.

MATERIALS AND METHODS

Research framework and scope

Therefore, this paper developed a framework for the study of green financing integration into Saudi Arabian financial institutions, focusing on Environmental, Social, and Governance innovations. The research explored the period from 2020 to 2024—a period of transformation for sustainable financing under Saudi Vision 2030. The conceptual framework sought to evaluate how financial institutions adopted green financing practices, regulatory frameworks shaping these practices, and the nature of ESG innovations that have driven this change. Situating the research within the Saudi context, it allowed a focused examination of the challenges and opportunities that were local in nature. This is concurrent with previous literature; for example, the work of Alkhatlan and Alrasheedy (2021) highlighted the pivotal role that national policies play in the development of sustainable finance.

Data collection approach

The data collection approach was mainly based on secondary sources to ensure comprehensiveness in the scope of the research. Articles retrieved from internationally recognized academic databases such as ScienceDirect, JSTOR, and Scopus were used to obtain information on green financing practices around the world. Particular attention was paid to publications that fell between 2020 and 2024 to provide current information on green financing and ESG practices in financial systems. The data extracted were localized from the governmental reports published by SAMA and the Capital Market Authority. These reports presented the national regulations, priorities, and progress of integrating ESG frameworks into the financial sector.

Major Saudi Banks like Riyadh Bank, Al Rajhi Bank, and Saudi National Bank's annual reports were screened, the latter of which described its contribution towards sustainable finance through the issue of green Sukuk and providing financial facilities towards Renewable Energy projects. Moreover, the global reports issued by the IFC and the GRI were considered in order to locate Saudi practices within the international context, as in the report by the Global Reporting Initiative, 2021. The sources are well-chosen in that they offer both a local and a global perspective.

Selection of case studies

The case study methodology was therefore adopted for detailed insight into how specific financial institutions in Saudi Arabia go about implementing green financing. The basis of selection for these institutions was related to the scale of their respective green financing programs, diversity pertaining to ESG-related programs, and the ones that showed compliance with various national and international standards of sustainability. Examples are Al Rajhi Bank, selected to lead in the financing of renewable energy projects and green sukuk, while Riyadh Bank was considered for innovation in ESG strategies.

It selects those case studies that could be supported through the published sustainability reports as well as by independent audits for ensuring the credibility and in-depthness of the work. These cases tend to represent samples of evolving Saudi financial institutions through their pursuit towards sustainability in relation to financial practices; as shown from studies such as Zubair et al. (2022), institutional leadership is needed in ensuring ESG principles are developed at an organization level.

Regulatory analysis

Most of the discussion related to this research was focused on an assessment of the green finance regulatory environment in Saudi Arabia. Policies and standards by SAMA and CMA were reviewed for their role in helping the financial industry with ESG principles, such as providing incentives for

the issuance of green bonds and sukuk, and implementing required ESG reporting for listed firms. Al-Ansari et al. in 2023 explained that the introduction of relevant rules would greatly accelerate the transition toward green financing.

The study also focused on Saudi legislation that was in line with international norms, such as the United Nations Principles for Responsible Investment, to show how international commitments influence local regulations to keep up with competitiveness.

Technological innovations supporting green financing

This study also analyzed the ways through which technological development supports green financing and ESG practices. Certain technologies that Saudi Arabian financial institutions have been increasingly adopting to help improve aspects such as transparency and efficiency in sustainable finance include blockchain and AI. For instance, blockchain technology has been adopted for tracking funds used in various ESG projects with a view to ensuring that these are spent for purposes intended by such funds. Ahmed et al. (2022).

AI-powered analytics help to assess portfolios for their potential environmental and social impacts. An example is the use of AI by Riyadh Bank to analyze the carbon footprint of its project financing, fully aligning investment decisions with ESG objectives. Works such as that by Khan et al. (2021) showed how these technologies were making sustainable finance more accessible and trustworthy.

Limitations and ethical considerations

One limitation of the study is that it rests solely on secondary data, which may not reflect the very latest on-the-ground developments. However, to an extent, this was overcome by cross-referencing information across multiple credible sources for accuracy and comprehensiveness.

Ethical considerations included citing all data sources appropriately to keep the work academically honest. The study followed responsible use guidelines on secondary data and presented findings in a manner that was transparent and objective.

The materials and methods in this paper indeed provided a firm ground on which an understanding of the mechanisms and innovations driving green financing in Saudi Arabia could be built. With a combination of local data and international insight coupled with advanced technologies, the research gave a full view of this fast-evolving field and indicated peculiar opportunities and challenges faced by financial institutions in the country. This qualitative research study investigated the role of green financing in financial institutions' transformation in Saudi Arabia, with a focus on the emphasis on ESG innovations. A very extensive review was conducted of the data available in secondary sources from journals, industry-level reports, government-level published data, and case studies spanning 2020-2024. The focus is specifically on these years because green finance practices and inroads of ESG within Saudi Arabia are at an accelerated level of development. This logically fits into faster efforts to reach the goals envisioned by the government of Saudi Arabia, known as Vision 2030.

The review of the literature ranged from purely academic works on performance and uptake analyses of the green financial instruments, such as green bonds and sukuk, among others. For example, studies such as Alqahtani (2021) and Hussain et al. (2023) have provided insights into the development of these instruments within Saudi financial markets. These have been supported by industry reports from organizations such as the Saudi Arabian Monetary Authority and the Capital Market Authority important to understand regulatory developments and compliance requirements related to ESG.

The paper has included case studies of certain financial institutions in Saudi Arabia to make the analysis reliable and complete. Examples include the issuance of green sukuk by Al Rajhi Bank and ESG investment strategies of the Saudi National Bank. Examples like these have been chosen because they are among the most important in the market and also fully correspond to international standards of sustainability.

It also included the identification and analysis of the regulatory frameworks introduced by Saudi authorities to support green financing, including a review of policy documents such as the ESG disclosure mandates by the CMA in 2022 and the SAMA sustainable finance guidelines in 2022. These

reviews allowed the study to assess how the regulatory environment has effectively promoted ESG compliance among financial institutions.

Data analysis focused on repeated themes relating to best practices, challenges, and opportunities for green financing. Thematic analysis therefore provided a means of organizing such data into key categories related to the role of green sukuk in financing renewable energy projects, the adoption of ESG criteria in investment decision-making, and challenges related to the implementation of standardized reporting frameworks. By structured approach, such findings would be comprehensive and reflect the current status of green financing within Saudi Arabia.

It also, therefore, considered the aim of the study and reviewed various technological innovations that have shaped ESG disclosure and operations in financial institutions. Technologies considered for review were those that could help in enhancing transparency, improvement in decision-making processes, and ensuring full compliance with ESG standards; examples include blockchain and artificial intelligence.

RESULTS

The findings highlight the huge steps taken by Saudi financial players in the implementation of ESG principles into their daily practices and actualization in green finance. The core drivers for the transition from 2020 to 2024 are: issuance of green financial instruments, adoption of ESG-themed investment strategies, and establishment of supporting legislative frameworks.

Most noticeably, green bonds and sukuk issued by Saudi financial institutions rose. For instance, a recently issued \$500 million Green Sukuk has been a milestone transaction by Al Rajhi Bank in 2023 in financing renewable energy projects with due compliance to the standards of the International ESG. In this similar vein, the \$750 million green bond issued by the Saudi National Bank in 2022 saw huge interest from both domestic and international investors, indicating an increasing appetite for sustainable investments. These, therefore, underline the role of green financial instruments in aligning Saudi Arabia's financial sector with global trends in sustainability. Results also indicated significant ESG integrations into the investment portfolios of Saudi financial institutions. As an instance, Riyadh Bank initiated an ESG-themed mutual fund in 2021 which became very successful, thus indicating increased market demand for sustainability-themed products (Hussain et al., 2023). Besides, there is a quintessential evolution in terms of corporate governance, given the number of institutions that have established ESG committees to oversee adherence and sustainability initiatives. This structural change reflects long-term commitment to the integration of ESG principles into core financial operations.

On the regulatory side, the most important breakthrough was the demand from the CMA in 2022 for all listed businesses to report ESG information. As a result, it heightened transparency to facilitate investors in making prudent choices based on the sustainability performance of each company. In addition, SAMA prepared in-depth guidelines that would enable the adaptation of ESG considerations within the risk assessment framework for banks. These two moves were important to lay the ground where sustainability could thrive within the financial sector.

In addition to that, the review had shown different impediments to fully developing green finance in Saudi Arabia: in particular, an absence of one commonly applied ESG reporting framework raises considerable barriers regarding the evaluability and comparability of different organizations' sustainability performances. According to Alqahtani (2021), the main barrier still remains the lack of knowledge and experience of financial professionals in ESG issues. The challenge is at the core of targeted capacity-building programs and increased international collaboration in implementing best practices.

Promising directions for technical development were also discussed. For example, blockchain technology has been identified to enhance the credibility and transparency of ESG reporting (Hussain et al., 2023). Artificial intelligence applications have also been promising in enhancing risk assessment models with predictive analytics that include ESG variables. These developments provide a pathway through which Saudi financial firms can enhance their ESG capabilities and improve their alignment with international standards.

Conclusion: Findings of this study demonstrate the changing face of Saudi Arabian banking with ESG innovation and green financing. Though Saudi Arabia began with a flying start, its well-reviewed issuance has supportive regulations for this path.

DISCUSSION

The findings show how green finance can structurally change Saudi Arabia's financial sector. In line with Vision 2030, by offering their services, financial institutions are facilitating economic diversification and environmental sustainability. The success of green bonds and sukuk is a clear indication that the market has welcomed sustainable financial instruments. Al Rajhi Bank's green sukuk attracted foreign investors, showing the Kingdom's increasing importance in sustainable finance. (Khan et al., 2022). However, even this road is not even. An incomplete analysis of sustainability performance is yet provided through a non-standard ESG reporting system Alqahtani, 2021,. Besides, it is also difficult to apply the principles of ESG appropriately, given the experience of financial institutions with them remains limited. International cooperation and such capacity-building programs are very much needed for bringing in knowledge as well as an application of the principles of ESG.

Therefore, technology could be the key towards the future that might help significantly to overcome the challenges mentioned above. Whereas AI may give more complex risk assessment models, new technologies like blockchain may give deeper insight into ESG reports (Hussain et al., 2023). This also creates avenues for regional ESG alliances to facilitate the exchange of expertise to further advance sustainable cooperation.

In a nutshell, green finance has totally readjusted Saudi financial institutions to global trends in sustainability and the mandate of Vision 2030. Further, maintaining this momentum in the direction of long-term economic resilience will require sustained investment in ESG innovations underpinned by robust regulatory frameworks and driven by technological advancements.

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