



Project Deliverable

The Impact of Sustainable Finance and Green Investment on Financial Performance and Sustainable Development in Saudi Arabia

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Introduction

The global financial system has experienced a fundamental transformation over the past decade, driven by accelerating environmental degradation, climate volatility, and a structural shift in societal expectations. This shift has propelled sustainable finance and green investment from the periphery of corporate social responsibility to the core of institutional capital allocation. Sustainable finance represents the integration of environmental, social, and governance (ESG) criteria into financial decision-making processes, directing capital toward activities that generate long-term socio-economic value while preserving ecological integrity. Concurrently, green investment operates as a primary instrument of this transition, specifically targeting carbon-mitigation technologies, renewable energy systems, waste management infrastructures, and water conservation technologies.

For resource-dependent economies, the necessity of adopting sustainable financial practices is compounded by the structural vulnerabilities of hydrocarbon reliance. In the Kingdom of Saudi Arabia, this transition is strategically guided by Vision 2030, a national development blueprint designed to diversify the country's economic base, stimulate private sector growth, and foster sustainable development. To operationalize these objectives, the Saudi government has launched several prominent initiatives, including the Saudi Green Initiative (SGI), which targets net-zero carbon emissions by 2060 through the G20-endorsed Circular Carbon Economy (CCE) approach. The successful execution of these macroeconomic policies requires a massive mobilization of private and sovereign capital through structured green financing frameworks.

Understanding the relationship between sustainable finance, green investment, and corporate financial performance is therefore critical for corporate managers, institutional investors, and policymakers. While the transition to green practices involves significant capital expenditures, empirical research suggests that robust sustainability programs mitigate systemic risks, reduce the cost of capital, and ultimately enhance corporate market valuation. This research report provides a comprehensive, empirically grounded analysis of how sustainable finance and green investment influence corporate profitability, market valuation, and sustainable economic development within the institutional and regulatory context of Saudi Arabia.

Research Problem

Despite the rapid expansion of sustainable finance globally and the robust political commitment of the Saudi government through Vision 2030, there remains a critical research and execution gap regarding the financial consequences of corporate sustainability in emerging markets. Historically, corporate leaders and conservative investors have viewed green initiatives as a short-term cost center that penalizes financial returns and compromises shareholder wealth. Consequently, there is an urgent need to empirically evaluate whether the adoption of sustainable finance and green investment principles leads to superior financial performance or represents an economic trade-off for listed Saudi companies.

Furthermore, while the national government has established comprehensive sovereign green finance frameworks, local and municipal execution faces substantial challenges, including regulatory fragmentation, technical expertise gaps, and limited domestic investor awareness. This study addresses these issues by investigating the causal links between ESG performance and corporate profitability, identifying the structural barriers to local green bond adoption, and evaluating the macroeconomic contributions of sustainable finance to the Saudi economy.

Research Questions

1. What are the conceptual definitions, dimensions, and operational mechanisms of sustainable finance and green investment within the modern global financial landscape?
2. What are the primary structural instruments used to facilitate sustainable finance, and how are they implemented in emerging markets?
3. What is the empirical impact of environmental, social, and governance (ESG) practices and green investments on the financial performance, profitability, and market valuation of listed companies in Saudi Arabia?
4. How do sovereign initiatives, regulatory frameworks, and national programs in Saudi Arabia accelerate the mobilization of capital toward sustainable projects?
5. What are the key institutional, technical, and governance challenges that impede the effective implementation and adoption of green finance instruments at the corporate and municipal levels?

Research Objectives

- To systematically define and deconstruct the concepts of sustainable finance and green investment, outlining their integration within corporate governance frameworks.
- To identify and evaluate the key financial instruments including green bonds, green sukuk, blue bonds, and sustainability-linked facilities that support the green transition.
- To empirically analyze the impact of ESG disclosures and green investments on key corporate financial indicators, specifically Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q, within the Saudi Arabian stock market.
- To examine the strategic role of Saudi Arabia's national frameworks, sovereign wealth funds, and debt management agencies in scaling up sustainable finance under the umbrella of Vision 2030.
- To identify the structural, institutional, and technical challenges facing local entities and municipalities in adopting green finance, and to propose actionable policy recommendations.

Significance of the Study

This study holds significant theoretical and practical value for several key stakeholders in the Saudi Arabian economic ecosystem. At the academic level, it contributes to the expanding literature on sustainable finance in emerging, resource-dependent markets by providing rigorous empirical evidence that challenges the traditional trade-off hypothesis between sustainability and profitability. By establishing a clear link between green practices and market outperformance, the study provides a robust business case for corporate managers to integrate ESG factors into their long-term corporate strategies.

For institutional investors and international Qualified Foreign Investors (QFIs), this report clarifies the financial premiums, risk mitigation benefits, and regulatory landscape associated with green assets in the Saudi market. Furthermore, the study offers valuable insights for public policymakers, the Capital Market Authority (CMA), and the Saudi Exchange (Tadawul) as they refine sustainability reporting guidelines, draft climate-related regulations, and develop financial incentives to accelerate capital flows toward eco-friendly initiatives, thereby supporting the realization of Vision 2030.

Research Hypotheses

- H_1: There is a statistically significant positive relationship between robust sustainable finance practices (high ESG performance) and corporate profitability (ROA and ROE) among listed Saudi Arabian corporations.
- H_2: Active participation in green investment and sustainable disclosures significantly enhances the corporate market value and investment appeal (Tobin's Q) of public companies in Saudi Arabia.
- H_3: The integration of structured sustainability principles into corporate governance frameworks increases investor confidence and improves corporate competitiveness in carbon-intensive and heavy-polluting industries.

Research Design and Analytical Approach

This study utilizes a descriptive-analytical approach to examine the impact of sustainable finance and green investment on corporate financial performance and sustainable development. To ensure a comprehensive and scientifically rigorous investigation, the analytical framework combines quantitative empirical data from corporate financial disclosures with qualitative structural assessments of national policy initiatives.

The empirical foundation of the study is constructed by examining panel data from publicly listed companies on the Saudi Stock Exchange (Tadawul). Financial performance is evaluated using standardized indicators, specifically Return on Assets (ROA) and Return on Equity (ROE) to measure internal operational efficiency and profitability, and Tobin's Q to capture forward-looking market valuation and investor sentiment. These financial metrics are systematically regressed against independent ESG performance scores and green investment indices.

To address potential endogeneity, reverse causality, and firm-specific heteroscedasticity, the research highlights econometric models utilizing the Two-Step System Generalized Method of Moments (GMM) and Fixed Effects panel regression. This empirical analysis is supplemented by sovereign debt allocation data from the National Debt Management Center (NDMC) and exploratory factor analysis (EFA) data from expert surveys on municipal green bond adoption. This multi-dimensional approach ensures that the findings are robust, statistically validated, and highly applicable to the unique institutional and economic architecture of Saudi Arabia.

Theoretical Literature Review and Comparative Regional Frameworks

To contextualize the green finance transition, it is essential to explore the corporate finance theories that justify sustainable capital allocation: stakeholder theory, signaling theory, and the resource-based view (RBV). Collectively, these theories suggest that managing relationships with environmental and social stakeholders is not merely an ethical obligation but a strategic mechanism for resource optimization, operational resilience, and competitive differentiation.

Historically, emerging markets faced a scarcity of structured green assets. However, the MENA region has recently witnessed pioneering green debt issuances that serve as blueprints for Saudi Arabia's current trajectory. Arab countries have increasingly utilized green bonds and green sukuk which combine Sharia-compliant investment structures with identified green use-of-proceeds to bridge the infrastructure funding gap.

The regional transition began in Morocco, which issued the MENA region's first green bond in 2016 (MAD 1.15 billion), subsequently expanding into corporate green bonds, green mobility bonds in 2020 (MAD 1 billion), and municipal green bonds in 2022 (MAD 1 billion). Similarly, Egypt demonstrated sovereign leadership by issuing the region's first sovereign green bond in 2020 (USD 750 million),

which was 7 times oversubscribed, with proceeds allocated to pollution control, water management, clean transportation, and renewable energy. In the private sector, the United Arab Emirates has led corporate issuances, including the region's first corporate green bond in 2017 (USD 587 million) and the first corporate green sukuk in 2019 (USD 600 million). These regional milestones demonstrate that aligning institutional debt structures with clear environmental additionality satisfies international ESG mandates while preserving competitive pricing dynamics.

In the corporate sphere, companies like Xylem have successfully demonstrated how aligning positive environmental outcomes with economic results reduces financing costs. Xylem refinanced a USD 500 million Blue Bond in 2026 to fund water-related projects, integrated sustainability targets into its demand deposit accounts, and integrated ESG incentives into its supply chain finance agreements using EcoVadis scores. This corporate integration shows that sustainable finance is transitioning toward value-creation, where capital deployment is directly tied to quantifiable environmental outcomes and asset-level productivity.

Empirical Analysis of Green Investment and Corporate Financial Performance

To test the research hypotheses, we examine recent empirical and econometric studies conducted on companies listed on the Saudi Stock Exchange (Tadawul). For many years, a primary concern of corporate executives was that adopting environmental and social initiatives would increase operational costs and harm short-term financial returns. However, recent research proves that this concern is unfounded in the modern Saudi capital market.

A seminal panel data study examined 50 listed Saudi Arabian companies over a five-year period from 2019 to 2023. Utilizing advanced statistical models designed to correct historical endogeneity and omitted variable biases, the study established the first direct causal connection between ESG performance and financial outperformance in the Saudi market. The research demonstrated that all three ESG pillars—Environmental, Social, and Governance—significantly enhance both corporate profitability (ROE) and market valuation (Tobin's Q). Crucially, the study showed that environmental initiatives yield clear, positive financial benefits, effectively reversing older regional literature which suggested that environmental expenditures had a negligible or negative impact on cash flows.

This is supported by another econometric study focusing on heavy-polluting listed corporations in Saudi Arabia from 2010 to 2023. Using a Two-Step System GMM model to address corporate endogeneity, the analysis revealed a highly significant positive relationship between comprehensive ESG disclosure and three performance indicators: ROA, ROE, and Tobin's Q. By investing in green technologies, energy-efficient operational systems, and robust social safety nets, heavy-polluting companies build stakeholder trust, mitigate regulatory litigation risks, and signal superior operational quality to the market. This corporate signaling reduces the firm's risk premium, leading to higher market valuations.

In contrast, an OLS regression analysis of 117 listed Saudi companies in 2023 demonstrated that high unmanaged ESG risk scores (representing high vulnerability to environmental, social, or governance crises) significantly hinder financial performance, particularly ROE and Return on Invested Capital (ROIC). This indicates that failing to implement robust sustainability risk-management frameworks exposes companies to severe financial and reputational penalties.

The financial premium associated with ESG and green investment is not uniform but varies across industrial sectors, reflecting different levels of exposure to transition and regulatory risks. Data tracking Saudi stock performance from 2020 to 2024 across five major industrial sectors indicates that ESG-focused companies consistently outperform traditional companies by an average of 3.8 percentage points annually.

Industrial Sector	ESG-Focused Company Annual Returns (%)	Traditional Company Annual Returns (%)	Annual ESG Performance Premium (Percentage Points)
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Energy	12.5	7.8	4.7
Manufacturing	11.2	7.4	3.8
Telecommunications	—	—	3.3
Real Estate	—	—	3.2
Five-Sector Average	—	—	3.8

Note: Performance differentials reflect structural premiums observed during both economic recovery and volatility.

The energy sector exhibits the most pronounced annual ESG premium (4.7 percentage points), followed by the manufacturing sector (3.8 percentage points). This performance gap exists because carbon-intensive sectors face the most severe regulatory scrutiny, carbon-tax liabilities, and export restrictions. Companies in these sectors that proactively implement environmental management systems, secure green credits, and reduce greenhouse gas emissions achieve significant cost savings and enjoy uninterrupted access to export markets with strict ESG mandates. Even in less carbon-intensive sectors, such as telecommunications and real estate, ESG-focused firms maintain meaningful performance advantages of 3.3 and 3.2 percentage points respectively, demonstrating that sustainability is a structural driver of value across the entire economy.

National Initiatives and Sovereign Green Financing Instruments

At the macroeconomic level, Saudi Arabia's transition toward sustainable development is financed through highly structured sovereign capital programs designed to support the goals of Vision 2030. The Saudi Green Bonds Market, currently valued at USD 10 billion, has experienced rapid growth driven by sovereign backing and utility-scale renewable energy infrastructure projects. The public sector remains the dominant issuer, leveraging international capital markets to fund large-scale national transformations.

In 2022, the Public Investment Fund (PIF) published its Green Finance Framework, establishing the criteria for Sharia-compliant and green capital deployment. PIF subsequently launched an inaugural USD 3 billion green bond, which was more than 8 times oversubscribed, with order books exceeding USD 24 billion from global institutional investors. The issuance was structured in three tranches: a 5-year tranche of USD 1.25 billion (5.000% coupon), a 10-year tranche of USD 1.25 billion (5.250% coupon), and a historic 100-year century tranche of USD 500 million (5.375% coupon), representing the first-ever century green bond issued by a sovereign wealth fund. The proceeds were directly designated to fund eligible green projects, including utility-scale solar and wind projects, green buildings, and clean transportation systems across major giga-projects like NEOM and the Red Sea Project.

Complementing the PIF's initiatives, the Ministry of Finance (MoF), through the National Debt Management Center (NDMC), established a national Green Financing Framework to align public spending with climate-resilience goals. Under this framework, on February 25, 2025, the Kingdom priced an inaugural EUR 1.5 billion sovereign green bond with a 7-year tenor, yielding 2.308% and carrying a Aa3/A+ rating. The proceeds were allocated to key environmental and climate adaptation programs in the general budget, with 31.4% earmarked for new financing and 68.6% for refinancing existing sustainable public expenditures.

Eligible General Budgetary Program	Allocated Net Proceeds (EUR)	Share of Total Bond Proceeds (%)	Targeted Strategic Environmental Outcomes

Sustainable Management of Living Natural Resources and Land Use	1,122,280,000	75.2	Enhancing soil quality, reversing desertification, and promoting sustainable agricultural land use.
Climate Change Adaptation	139,630,000	9.4	Developing extreme weather management systems and flood control infrastructures.
Renewable Energy Infrastructure	92,420,000	6.2	Accelerating solar and wind power generation to achieve a 50% renewable energy mix by 2030.
Energy Efficiency in Buildings	74,100,000	5.0	Developing resource-efficient public buildings and retrofitting existing municipal infrastructures.
Terrestrial and Aquatic Biodiversity	63,940,000	4.3	Protecting marine ecosystems, establishing wildlife sanctuaries, and preserving native biodiversity.
Total General Budgetary Allocation	1,492,380,000	100.0	Comprehensive realization of national net-zero and climate-resilience objectives.

Note: Budget allocation data reflects actual expenditures audited under the 2025 Green Bonds Allocation Report.

This distribution of funds highlights the multi-dimensional nature of Saudi Arabia's sustainability strategy. While renewable energy generation receives substantial direct investment, the overwhelming majority of public green bond proceeds (75.2%) is allocated to the sustainable management of living natural resources and land use. This allocation reflects the urgent necessity of combating desertification, improving municipal waste circularity, and securing water resources in an arid geographic environment, showing that the sovereign green framework is closely aligned with the Kingdom's most critical ecological risks.

Municipal Adoption Dynamics and Local Institutional Barriers

While sovereign green financing has progressed rapidly, translating these national policies into effective execution at the local and municipal levels remains a key structural challenge. Municipalities are crucial to the realization of Vision 2030, as rapid urbanization is projected to reach 85% by 2030, creating massive demand for localized green infrastructures, clean transit networks, and smart city technologies. However, the uptake of municipal green bonds in Saudi Arabia is highly limited compared to sovereign programs.

To investigate these municipal dynamics, an empirical study conducted an Exploratory Factor Analysis (EFA) on survey responses from 174 urban planning and public finance experts. The study analyzed how national policy objectives are translated, or constrained, at the municipal level under a highly centralized administrative structure.

Analytical Survey Factor	Mean Expert Score (1–5 Scale)	Statistical Consensus level	Key Empirical and Structural Findings
Funding Diversification	3.67	High Consensus	Over 66% of experts agree that municipal green bonds can successfully diversify municipal funding away from central oil revenues.
National Policy Coherence	3.55	Moderate-High	63.2% of experts confirm that Vision 2030's cohesive framework is a powerful tool to scale municipal green issuances.

Attracting Foreign ESG Capital	3.50	Moderate-High	Nearly 60% of respondents view local municipal green bonds as highly viable mechanisms to attract international ESG funds.
Renewable Energy Potential	3.49	Moderate-High	Strong agreement that local debt instruments represent a direct pathway to unlock municipal solar and wind microgrids.
Public-Private Partnerships (PPPs)	3.33	Low-Moderate	Reflects perceived governance gaps and fragmented risk-sharing mechanisms within local administrative systems.

Note: Survey factors are derived from EFA modeling of municipal financial readiness.

The EFA results reveal a high level of consensus among experts that municipal green bonds are highly viable tools for diversifying local funding sources (mean = 3.67) and aligning local projects with national sustainability targets (mean = 3.55). However, the lower score for the feasibility of PPPs (mean = 3.33) highlights severe concerns regarding fragmented risk-sharing mechanisms, overlapping ministerial responsibilities, and bureaucratic delays.

Inferential analyses of the expert survey responses demonstrated a statistically significant relationship between national policy coherence and foreign investment potential, with $\chi^2 = 32.45$ and $p = 0.009$. This indicates that establishing a unified, clear, and transparent regulatory framework across municipal and federal bodies is critical to building international investor confidence. Furthermore, a one-way ANOVA confirmed that experts prioritized funding diversification significantly higher than municipal-level PPP implementation, with $F(5, 1038) = 3.89$ and $p = 0.002$.

The primary barrier to local adoption is institutional and regulatory fragmentation. In a centralized governance system, local municipalities often lack the fiscal autonomy, technical green bond evaluation frameworks, and independent credit ratings required to issue localized green debt independently. For instance, a proposed plan to finance the Riyadh metro expansion through targeted municipal green bonds was halted due to overlapping ministerial jurisdictions, illustrating how centralized administrative boundaries can restrict local financial innovation. Addressing these structural bottlenecks is therefore essential to unlocking sustainable urban development.

Expected Research Outcomes

Based on the empirical evidence, econometric models, and structural analyses presented in this study, several key outcomes can be expected as sustainable finance continues to mature in Saudi Arabia :

- **Consistent Financial Outperformance:** Listed Saudi corporations that proactively integrate ESG principles and green investments into their operations will continue to achieve a significant financial premium, characterized by higher ROE, ROA, and Tobin's Q, compared to their non-sustainable peers. This outperformance will be driven by operational cost savings, lower cost of capital, and enhanced market reputation.
- **Increased Inflow of Foreign ESG Capital:** As corporate ESG disclosure becomes more standardized and aligned with global frameworks like GRI and SASB, Saudi Arabia will attract a larger share of global ESG investment flows, strengthening the liquidity and depth of the Saudi Exchange (Tadawul).
- **Decentralization and Growth of the Green Bond Market:** Overcoming municipal governance gaps will lead to a surge in local green bond and green sukuk issuances, shifting the market from a purely sovereign-dominated landscape to a more diversified ecosystem featuring municipal, corporate, and financial institution issuers.

- **Macroeconomic Diversification and Green Employment:** The continuous scaling of green investments will act as a major catalyst for non-oil economic growth, driving entrepreneurship in the circular economy and generating thousands of highly skilled green jobs in the renewable energy, sustainable construction, and waste management sectors.

Strategic Policy and Corporate Recommendations

To accelerate the transition toward sustainable finance and maximize its positive impact on financial performance and sustainable development, the following strategic actions are recommended:

- **De-Risk Green Infrastructure through Blended Finance:** Policymakers should leverage the sovereign balance sheets of the PIF and national development banks to establish blended finance frameworks. By assuming first-loss risks or providing concessional debt, sovereign institutions can lower financing costs, attract private international capital, and make green infrastructure projects commercially viable.
- **Decentralize Municipal Finance and Build Local Technical Capacity:** The Ministry of Finance and the Capital Market Authority should develop standardized templates for municipal green bond issuance. This regulatory framework should grant qualified municipalities the fiscal autonomy to raise capital for local green projects. Simultaneously, specialized technical training programs must be implemented to equip municipal finance officers with the skills necessary to manage green bond frameworks, verify environmental additionality, and conduct impact reporting.
- **Mandate Standardized ESG Disclosures for Listed Companies:** The Capital Market Authority (CMA) should transition from voluntary ESG disclosure guidelines to a mandatory, phased reporting requirement for all listed companies on Tadawul, with a particular focus on heavy-polluting and capital-intensive sectors. These reporting requirements should be strictly aligned with leading global frameworks, such as the Global Reporting Initiative (GRI) and the International Sustainability Standards Board (ISSB), to ensure that corporate sustainability data is consistent, comparable, and reliable for international investors.
- **Promote Green Financial Literacy and Investor Education:** To address the limited awareness of green bonds among local investors, the Capital Market Authority and domestic banks should design and fund comprehensive public education campaigns, professional certification courses, and university curricula focused on sustainable finance and ESG investing. Increasing the green financial literacy of domestic retail and institutional investors is critical to expanding the local green capital market and reducing reliance on international capital.
- **Integrate Sustainability into Core Corporate Strategy:** Corporate managers must move away from treating ESG as a superficial compliance or public relations exercise. Sustainability must be deeply integrated into the core business model by identifying material ESG metrics that directly influence cash flows and operational efficiency. Firms should link executive compensation to the achievement of specific, audited sustainability targets, such as carbon emission reductions, waste circularity, and supply chain audit scores, to align corporate incentives with long-term sustainable value creation.

Conclusion

Sustainable finance and green investment have transitioned from optional ethical considerations to critical drivers of economic modernization and financial resilience in the Kingdom of Saudi Arabia. Strategically anchored within the vision of Vision 2030, the green transition is supported by highly successful sovereign debt issuances, comprehensive national environmental strategies, and a rapidly

evolving corporate regulatory landscape. Empirical and econometric evidence demonstrates that integrating ESG principles into corporate operations is not an economic trade-off but a source of competitive advantage. Proactive corporate sustainability is causally linked to superior profitability, enhanced market valuations, and lower cost of capital, particularly in carbon-intensive and heavy-polluting industries.

However, to fully realize this macroeconomic transition, Saudi Arabia must address its core structural challenges. Overcoming local governance gaps, establishing fiscal autonomy for municipal green issuances, mandating standardized corporate ESG reporting, and educating domestic investors are critical steps to unlocking the projected USD 2 trillion green finance opportunity by 2030. By building a transparent, integrated, and technically robust sustainable financial ecosystem, Saudi Arabia will not only accelerate its transition to a circular carbon economy but also establish itself as a global leader in sustainable development and green capital allocation.

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