


The impact of green innovation on sustainability and financial performance: Evidence from the Jordanian financial sector

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Abstract

The purpose of this study is to examine the relationship between sustainability performance (SP) and financial performance (FP), based on performance disclosures (reporting) of the Jordanian financial sector for the period of 2017–2020. The study employs green innovation (GI) indicators as moderating and mediating variables; by using hierarchical regression; as means of unlocking and examining the relationship between SP and FP; through the lens of the stakeholder theory. The hierarchical regression findings suggest that GI indicators partially mediate the relationship between SP and FP, but do not demonstrate a moderating effect. As a main result, it is indicated that Jordanian financial institutions may use SP transparency indicators as an incentive variable, which could influence their overall FP. The research also contributes to the existing literature by adding insight into the use of GI indicators in a developing country and the potential impact on financial institutions markets. These findings lend empirical credence to the generally held belief that increase disclosure benefits for both internal and external users.

KEYWORDS

financial performance, green innovation, hierarchical regression, Jordan, sustainability performance

1 | INTRODUCTION

The scope of modern disclosing (reporting) of information has expanded to encompass not only traditional financial data but also non-financial information. Previous research established that financial performance (FP) is a crucial indicator of an organization's financial health and can be influenced by information disclosure policies (Alketbi et al., 2022; Bahadori et al., 2021; Balon, 2020; Hamdallah et al., 2021; Raghuvanshi & Agrawal, 2020; Sabău-Popa et al., 2020). In particular, the disclosure of environmental, social, economic, and governance information identified significant attention in the academic fields. The belief that financial institutions may foster sustainability performance

(SP), while still creating economic value, has gained more traction in recent years. Despite this increased interest, empirical methods for studying SP and innovation processes are still in their early stages (Ar, 2012). According to some studies, managers might find themselves deterred from maximizing shareholder value due to social and environmental objectives (Al-Okaily et al., 2020; Menicucci & Paolucci, 2023). According to the neo-classical view, satisfying stakeholders other than shareholders may negatively influence a firm's ability to maximize profits and create value (Khan et al., 2018). Companies that fall short of expectations may cause change in shareholders behavior toward more responsible investing strategies designed to increase a firm's worth and lower long-term risk (Sarhan & Al-Najjar, 2022).

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Green innovation (GI) became a central issue in the corporate world, as companies are increasingly recognizing the need to adopt sustainable practices to remain competitive and address the pressing environmental challenges of SP, FP, and GI (Adomako & Nguyen, 2023; Bos-Brouwers, 2010; Iqbal et al., 2021; Khan et al., 2021; Mehraj & Kaur, 2022). GI refers to the development and commercialization of new products, services, and processes that are environmentally friendly and sustainable (Lovarelli et al., 2020; Nnamani et al., 2017). While previous research explored the impact of green supply chain management (Wu, 2013), charitable giving (Yu et al., 2021), and debt heterogeneity (Jin et al., 2019) on an organization's sustainability, the effect of GI has been neglected. Information disclosure may serve to promote sustainability and enhancing performance by reducing costs, improving resource efficiency, and creating new market opportunities (Javalgi et al., 2018). Despite the increased interest in GI, the connection between SP, FP, and GI is still difficult to comprehend. In particular, the study aims to address this gap in the literature by examining the effects of various moderating and mediating factors of GI on the relationship between SP and FP, that is not fully explored, and to unlock the main effect on the relationship between the variables. The financial sector also in emerging markets, like Jordan, often presents unique challenges and opportunities when juxtaposed with more developed economies. Jordan has been taking progressive steps toward sustainable development, especially in the financial sector. Given the push toward sustainability, understanding the dynamics of GI, SP, and FP in this context becomes critical. The nuances of these markets offer rich insights that can provide distinct perspectives and add to the existing body of knowledge.

Previous studies by Amores-Salvadó et al. (2014) and Hojnik and Ruzzier (2016) primarily focus on the effect of GI investment on business success, but this study takes a different approach by examining the impact on the relationship between SP and FP. By contributing to the existing literature on the economic effects of GI, as the study provides new insights into the variables that influence business sustainability. The aforementioned sources of data served as the foundation for the selection of SP and FP indicators as exogenous and endogenous variables, respectively. The indicators include return on assets (ROA), Tobin's Q, and sustainability score index. Although the study focused on the financial sector, it is crucial to note that this sector primarily operates through its relationships with clients and is therefore influenced by rules and directives with different goals and implicit or explicit boundary structures (Bayne, 2021).

The findings have implications for both academics and practitioners, which may find the study useful as a reference for future research in this area. On the academic side, the results contribute to the existing literature on corporate sustainability and its relationship with FP in the Jordanian financial sector and the influence of GI. For practitioners, managers in the Jordanian financial sector may employ the study's findings to learn more about how SP and FP are related by implementing them, and the effect of GI on their relationship. In addition, they may be able to design more effective sustainability indicators that are beneficial to shareholders. Furthermore, financial consultants will be able to offer improved services

to their clients based on a better understanding of sustainable financial practices. Furthermore, the government may also benefit from the results of the study, as it can inform the creation of regulations that encourage the financial sector's engagement in a green sustainable economy.

The rest of this paper is organized as follows. In the next section, we provide a literature review and formulate our research hypotheses. In Section 3, we describe our methodology and analysis results. In Section 4, we present our discussion and conclusion. Finally, in Section 5, we provide limitations and recommendations for future research.

2 | THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

This part of the research addresses certain areas of the Jordanian financial sector. Those areas are FP, SP, and GIs. The paper is interested in shedding the light on the exogenous and endogenous variables, and then make an effort to link them based on either a moderating or mediating GI influence.

2.1 | Stakeholders theory

One of the well-known theories in the literature is the stakeholder theory, which offers insight into how businesses respond to the needs of various stakeholders (Ananzeh et al., 2022; Khatib et al., 2021). Stakeholder theory suggests that companies are responsible to the community where they operate (Al Amosh et al., 2022). Therefore, they must meet the expectations of various stakeholders by providing evidence of the company's goodwill and enhancing its voluntary performance (Al Amosh & Khatib, 2023), as the utmost level of stakeholder satisfaction should be attained in addition to achieving their expectations (Alkurdi et al., 2023). Corporate SP is considered a foundational element for a company's survival and growth, and sustainability reporting is seen as a tool to inform stakeholders of a company's performance (KPMG, 2008a, 2008b). The idea of the mutual exchange of resources and benefits was somehow lost as the definition of stakeholders was expanded to include "any organization or individual who can affect or is affected by the attainment of the firm's objectives" (Freeman, 1984, p. 25).

The first characteristic of quality metrics is the relationship between SP and its evaluation of an organization's performance, which brings us to this point as various stakeholders measure the capacity to investigate the degree of satisfaction with sustainability and FP (Rinawiyanti et al., 2023). According to the stakeholder theory, improving FP can result from efforts related to sustainability (Wahba, 2008). One of the management's goals in engaging sustainability initiatives may be to improve FP by luring stakeholders like customers, suppliers, and consumers to transact with the business (Al Amosh & Khatib, 2023) governments and staff (Kim et al., 2023; Menicucci & Paolucci, 2023). Introducing and applying the stakeholder



theory is an effort to capture and analyze the larger context in which numerous interested parties are active. An input-output-like diagram shows the relationship between the company and a certain stakeholder, and the variations in the firm's position toward all of its stakeholders (Obel & Gurkov, 2023). Therefore, it is suicidal for a firm to reject stakeholder demands during a certain time, particularly if the group represents a threat to the company's survival (Acquah et al., 2021).

The stakeholder theory emerged to assist illuminate the relevance of the numerous secondary stakeholders by raising their level of awareness, including that of environmental disclosure and indicators, in addition to the increase in environmental consciousness of the decision makers (Huge-Brodin et al., 2020). Shi and Tsai (2022) also explored the impacts of stakeholder pressures on green practices or environmental performance. Song et al. (2017) developed a novel conceptual model that depict the relationship between green procurement and business performance, taking operational efficiency into account as the mediator and stakeholder satisfaction as the moderator. The focus of Bıçakcıoğlu-Peynirci and Tanyeri (2022) study is on an area that has received little attention, on the competing interests of stakeholders, and on the factors that influence exporters from emerging markets to embrace green business practices. In this way, stakeholders make it more difficult for the company to operate by putting pressure on it to adopt a greener stance; however, by doing so, they also encourage it to be competitive when related in developed countries. Due to their dismal economic circumstances and rising levels of corruption, developing countries face significant obstacles that obstruct their ability to develop.

2.2 | Financial performance

Organizations resources are dispersed throughout a company into a control system, which is essential for improved performance. This system should instigate with planning and culminate with reporting to internal and external stakeholders, serving as a plan foundation (Mahmoudian et al., 2020). Banks should conduct a comprehensive and fair evaluation of both assets and loans prior to lending, to ensure the quality of financial institutions assets, and thoroughly investigate long-term loans and investment projects (Pham et al., 2022) where there are many FP indicators. The advancement of business and technology drives companies to compete and produce superior products, leading to ongoing performance improvements (Shields, 2022).

Buallay (2022a) and Esteban-Sanchez et al. (2017), used ROA as FP indicators, which is computed as the ratio of net income after taxes to average total assets. Tobin's Q, on the other hand, is determined as the ratio of the sum of the market value of equity and total book value of liabilities to total book value of assets (Albertini, 2013). Popa et al. (2022) and Zhou et al. (2022) established the continuous relationship between FP and environmental, social, and governance as sustainability indicators disclosure index components, albeit with low statistical significance. Accounting for innovation implementation helps managers to identify products with elevated social and environmental

costs, which in turn facilitates the evaluation of business FP (Al-Okaily, 2021, 2022, 2023; Abd Rahman et al., 2020; Al-Okaily &, 2022; Nnamani et al., 2017). The study by Hamdallah and Srouji (2022) highlights the importance of incorporating both financial and non-financial information from annual reports for improved strategic management and better strategy assessment. Thus, it can be argued that ROA and Tobin's Q are utilized as measures of FP.

2.3 | SP reporting

In the recent years, the concept of sustainability gained immense significance in the business world and become a crucial aspect of measuring a company's financial success (Alshbili et al., 2021; Alshbili & Elamer, 2020; Amin et al., 2022; Boulhaga et al., 2023; Elamer et al., 2022; Elmagghi et al., 2019). Additionally, the weak governance structures in developing countries led to an increase in corruption as well as a lack of transparency and integrity (Adams & Larrinaga, 2019; Al Amosh et al., 2023). Reddy and Gordon (2010) emphasize the importance of a consistent approach to sustainability-reporting, as using a fragmented approach, which can lead to the failure of the company. The Global Reporting Initiative (2022) highlights the rise of sustainability reporting as a prominent business center in the late 1980s. The Integrated Reporting Council has taken a proactive step in aligning sustainability reporting standards by coordinating standards for climate-related disclosures (Rowbottom, 2023). Hamdallah, Al-N'eimat, et al. (2022) and Sáez-Martínez et al. (2016) emphasize that sustainability reporting not only measures a company's activities, but also serves as a means of accountability to both internal and external stakeholders, with the ultimate goal of promoting sustainable evolution.

Bartlett (2012) points out that the terms "sustainability" and "sustainable" are differently depending on who is using them and their distinct connotations. The implementation of corporate sustainability reporting requirements enables stakeholders to compare the SP of businesses and incentivizes them to take actions that benefit both the environment and society. The resource-based view suggests that environmental initiatives carried out by banks, for themselves or their clients, can lead to improved profitability. Additionally, the sustainability report provides stakeholders with a better understanding of the company's efforts toward promoting sustainable practices, managing environmental impact, and contributing to the well-being of the community and society (Ahmed et al., 2020; Hassan et al., 2020, 2021; Hazaea et al., 2022; Kazemi et al., 2023; Khatib et al., 2021; Roberts, Hassan, et al., 2021; Roberts, Nandy, et al., 2021; Ullah et al., 2022). Such reports help increase transparency and accountability, build trust with stakeholders, and communicate the company's commitment to sustainable practices. Furthermore, the sustainability report helps companies to identify areas where they can improve their SP and measure their progress over time (Zyadat, 2017). In conclusion, the sustainability report plays a crucial role in promoting sustainable business practices and fostering stakeholder engagement, thereby contributing to the overall goal of SP.

The purpose of sustainability reporting should not solely be for public relations, but rather serve as a tool for companies to identify their strengths and weaknesses, and understand the interconnections between them. By doing so, corporate sustainability reporting can increase the efficiency in work and management of natural resources, which remains important to stakeholders (Srouji et al., 2019). Additionally, sustainability reports can help persuade investors that the company is less risky compared to other companies (Oprean-Stan et al., 2020). The evolution of sustainable development has resulted in the integration of a governance perspective that considers the ethical and environmental ramifications of corporate decision-making within a strategic framework (Thomas et al., 2021). The concept of interaction is instrumental in comprehending the connection between sustainable development and enhanced FP (Nizam et al., 2019). These verdicts suggest that the reporting of sustainability information plays a critical role in assessing the operational performance of businesses in their global environments, as well as its significance in terms of profits and diversification.

2.4 | Sustainability and financial performance

The relationship between SP and FP has been a topic of interest for researchers and practitioners in recent years. There is growing recognition of the importance of considering the economic, social, and environmental aspects of a company's operations when assessing its performance (Abeysekera, 2022). The sustainability report provides stakeholders with information on the company's economic, social, and environmental performance, which is different from traditional financial reporting that primarily focuses on FP (De Villiers & Sharma, 2020). According to the fundamental tenet of sustainability, current actions should not compromise the ability to improve standards of living in the future (Repetto, 1987). There is evidence that companies that prioritize material sustainability challenges in their plans and operations are more successful than those that do not (Jorgensen et al., 2022). Additionally, organizations that excel in sustainability reporting frequently gain the support of their peers and have a favorable relationship between sustainability disclosure and FP measured by share prices (Ng & Rezaee, 2015).

A wide variety of scenarios examined how sustainability reporting influences FP. For instance, the 1998-launched Dow Jones sustainability index depends on the FP of businesses, as measured by their return on equity (Lassala et al., 2017). Studies have investigated the internal benefits of sustainability reporting for performance improvement, including the relationship between sustainability reporting and performance (Mahmoudian et al., 2020) and the impact of sustainability control systems on performance (Lueg & Radlach, 2016) by using numerous methods (Jha & Rangarajan, 2020). There is evidence to suggest that the relationship between sustainability and organizational performance is an important area that requires further research (Carp et al., 2019). Dos Santos et al. (2022) study clarified the importance of governance, assessment and analytical tools, and disclosure practices in promoting sustainable growth and performance.

However, there is also a view that there may be a negative relationship between a company's sustainability and its FP. Some argue that when businesses engage in sustainability initiatives, their costs go up and their FP suffers (Friedman, 2007) which affects the market value (Galbreath, 2018). The stakeholder theory posits that sustainability-related actions can lead to improved FP (Al Amosh & Khatib, 2022; Wahba, 2008), and a study on small- and medium-sized businesses found that sustainability reporting had a positive impact on ROA, which is a positive performance indicator (Hamad & Yassin, 2022). Meanwhile, sustainability had a positive significant effect on Tobin's Q of public companies in North America (Ilyas and Osiyevskyy, 2022). By analyzing the factors influencing organizations' environmental policies and how adopting these initiatives improves their international operations for exporters from emerging countries, several implications were offered in this study, based on the stakeholder's theory. Given the conflicting evidence and differing views on the relationship between sustainability and FP, it is important to examine the relationship using empirical research methods, by assessing the following hypotheses in light of the literature review:

H1. *There is a significant relationship between SP and FP of Jordanian Financial Institutions, measured by ROA.*

H2. *There is a significant relationship between SP and FP of Jordanian Financial Institutions, measured by Tobin's Q.*

2.5 | Green innovation

The concept of GI Indicators has been a topic of interest in the field of accounting and economics in recent years (Sharma & Bhat, 2022; Song & Yu, 2018; Tang et al., 2018). GI describes initiatives taken to advance the creation and application of environmentally friendly methods, products, management systems, and procedures (Kemp & Arundel, 1998). Green management innovation, green process innovation, and green product innovation comprise this concept (Chen et al., 2022; Srouji et al., 2023). Financial institutions have identified green finance as a way to minimize environmental risk and promote environmental quality (Xu & Gao, 2022). As part of its corporate social responsibility, the building sector often prioritizes climate change (Soares, 2022). Environmental concerns, particularly those related to water, have become a major barrier to sustainability and have drawn a lot of attention in recent years (Liu, Kim, et al., 2022; Liu, Su, & Zhang, 2022).

The implementation of GIs does not always result in a favorable economic balance for organizations, but on the long term, intangible rewards may arise. Banks and investors are becoming more interested in backing businesses that uphold GIs and sustainable development (Kartadjumena & Rodgers, 2019). For financial businesses, this presents an opportunity to establish a positive status as an ethical organization (Thomas et al., 2021). The use of green revenue reporting and sub-sector and sub-segment criteria can help identify sustainable products, goods, and services and promote the transition to a green

economy (Golubeva, 2022). A study has highlighted the connection between technology and sustainability and the need for regulatory monitoring and knowledge to promote technological growth for sustainable goals, where managers emphasize the importance of understanding long-term global industrial trends (Golubeva, 2022). Yang et al. (2020) added that the mediating effect of green technology in developing regions is significantly larger than that in developed regions.

Environmental issues are gaining increased attention from businesses due to rising external pressure from stakeholders (Mir & Bhat, 2022). Developing economies have yet to adopt the concept of green banking, and there is a need for more research in this area (Amir, 2021; Sharma & Choubey, 2022). Thus, the literature suggests that GI plays a crucial role in promoting sustainability and environmentally friendly practices in organizations, particularly in the financial sector. In Khattak (2023), GI motivates businesses to develop into competent organizations and improve their environmental performance, as a moderating variable. Results showed that using GI and environmental sustainability ideas, businesses could operate sustainably. Chouaibi and Chouaibi (2021) finding stated that societal and ethical strengths—combined with the moderating impact of GI—increase business value, whereas deficiencies do the opposite. Meanwhile, GI mediated the relationship between SP and lean production (Afum et al., 2021). According to García-Machado and Martínez-Ávila (2019) research GI functions as a mediator variable, in the association between green culture and environmental performance. Conversely, our anticipated contribution to the literature is to examine the role of GIs as a moderator or mediator between FP and SP in a rising market, and unlock the relationship. This study contributes to our understanding of stakeholders as resource providers to boost the financial benefits of green initiatives, which also sheds light on the association's boundary conditions, in relation to SP indicators. To fill in the gaps in the literature, the study addresses both the moderating and mediation models as presented in Figures 1 and 2 and focus on financial companies. As far as we are aware, this relationship has not been thoroughly studied, which supports the goal of this investigation and leads to the following hypotheses:

H3. *There is a moderating effect of GI on the relationship between SP and FP, measured by ROA.*

H4. *There is a moderating effect of GI on the relationship between SP and FP, measured by Tobin's Q.*

H5. *There is a mediating effect of GI on the relationship between SP and FP, measured by ROA.*

H6. *There is a mediating effect of GI on the relationship between SP and FP, measured by Tobin's Q.*

3 | METHODOLOGY AND ANALYSIS RESULTS

3.1 | Research sample

The study uses primary and secondary data collected from public annual reports of the financial sector companies found on the Amman Stock Exchange (ASE) website from 2017 to 2020. The sample size, although modest, is comparable to previous research studies like Bose et al. (2017) and Sobhan (2016), taking into consideration the unique characteristics of Jordanian companies and its investment climate as a Middle Eastern country. The study was limited to the financial sector and collected data from the financial reports of 33 out of 111 financial companies due to missing non-financial data, related to both sustainability and green indicators. As worldwide, the efficiency and strength of a country's financial system play a significant role on how well its economy develops (Al Amosh & Khatib, 2022). However, the sample consisted of 15 Jordanian banks listed in ASE and 18 insurance companies. Where Jordan's banking industry is significant in terms of both size and influence, and high internal control in comparison to other companies. The market value of the banking sector in 2022 (JD8 billion) represented 90% of the market value of the financial industry and 41% of the market value of all sectors combined (Mansur, 2023). Meanwhile, the primary

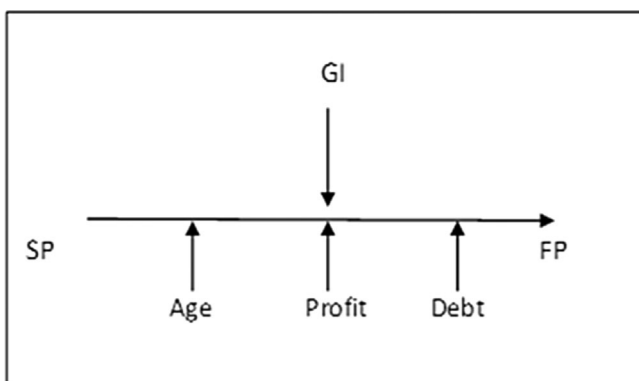


FIGURE 1 Moderating model.

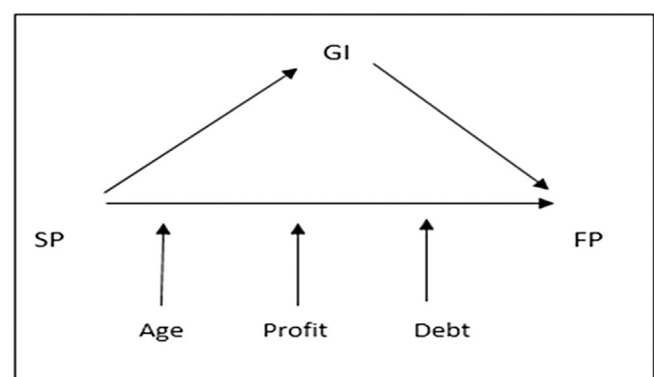


FIGURE 2 Mediating model.

function of insurers; which is essentially to absorb risks, improves the financial stability of the financial markets, and fosters an environment of tranquility for business enterprises. Enterprises would not be able to survive without insurance since risky enterprises may not be able to assume responsibility for any risks in a continually shifting global economy (Tuffour et al., 2021).

3.2 | Variable measurement

The data was analyzed using three dimensions: Firstly, FP was represented by two variables—ROA and Tobin's Q; then SP by

13 non-financial indicators. Finally, the study measures the impact of GI indicators as either a moderator or mediator, using 12 financial institution-eligible GI non-financial items, as outlined in Table 1. To test and unlock the relationships and effects between the variables, the study used hierarchical regression analysis, moderating, and mediating analyses. When all other variables have been taken into account, the dependent variable can still have statistically significant variance that can be explained by variables of interest, using a technique called hierarchical regression, which is applied in our study. In the meantime, a moderator influences the strength and direction of the relationship between the exogenous and endogenous variables and contextualizes the effect. Whereas, a mediator

TABLE 1 Measurement model.

Research variables	Research items
Firm performance	ROA (Cho et al., 2019; Thuy et al., 2021) Tobin's Q (Cho et al., 2019)
Sustainability performance indicators (Amman Stock Exchange, 2018)	
SP1	CEO bonus and salary compared to median FTE salary
SP2	Comparing the median salaries of men and women
SP3	Change in percentage for FTEs, contractors, and consultants
SP4	Women's share of FTE, contractor, and consultant positions
SP5	Does your business have a non-discrimination policy that it follows?
SP6	Injury and fatality totals as a percentage of the workforce
SP7	Is child labor not allowed at your business?
SP8	Is there a human rights declaration or policy that your company publishes and adheres to?
SP9	Percent of independent and female board members
SP10	Sum of all grants and sponsorships generated by the business
SP11	Employee participation in training programs
SP12	The quantity of community projects the company has started
SP13	Does your business provide employees with health insurance?
Green Innovation Indicators (Chen et al., 2022; Khairunnessa et al., 2021; Zheng et al., 2021)	
GI-1	Information disclosing the institutions' policies on environmental protection, or the institutions' worries and awareness regarding environmental protection, and/or the institutions' policies addressing climate change
GI-2	Reducing the amount of paper used by encouraging internal email communication, printing double-sided, and recycling paper
GI-3	Data about the usage of technologies, such as water-saving faucets, and policies to reduce gas and water waste in internal operations at the institution
GI-4	Data about using eco-friendly resources, such as recycled paper or solar electricity, is available
GI-5	Data on actions made to reduce staff business travel and emissions in order to mitigate climate change
GI-6	Information on any training sessions, seminars, or workshops that will be happening soon or that are scheduled to raise public awareness of the environment
GI-7	Any awards received by the institution in recognition of its environmentally friendly practices, contributions to environmental advances, or excellence in environmental reporting procedures
GI-8	Data about supporting environmental sustainability initiatives, such as planting trees in cities and villages or restoring and maintaining historic buildings and infrastructure
GI-9	Data about creating a fund to fight climate change
GI-10	On the organization's letterhead and in other internal communication mediums, information on integrating green marketing is included, such as "Plant a Tree, Save the Environment"
GI-11	Information on institution activities and engagement in the green movement, such as education programs for institution workers that motivate them to participate in green operations
GI-12	The annual report has distinct pages for its green reporting

explains how the relationship between two variables is established by explaining the connecting relationship. Green accounting is not employed in ASE, and is a voluntary disclosure and reporting issue; hence the GI indicators were primarily taken from other studies, while the SP indicators are as indicated by the Guidance on Sustainability Reporting (Amman Stock Exchange, 2018), all based on disclosed information in the annual reports, either by a financial or non-financial manner.

Hierarchical equation

$$\text{PERFORMANCE} = \beta_0 + \beta_1 \text{SP}_{i,t} + \beta_2 \text{AGE}_{i,t} + \beta_3 \text{PROFIT}_{i,t} + \beta_4 \text{DEBT}_{i,t} + \sum \text{YEAR}_{i,t} + \epsilon_{i,t} \quad (1)$$

Moderating equation

$$\text{PERFORMANCE} = \beta_0 + \beta_1 \text{SP}_{i,t} + \beta_2 \text{SP}_{i,t} \times \text{GI}_{i,t} + \beta_3 \text{GI}_{i,t} + \beta_4 \text{AGE}_{i,t} + \beta_5 \text{PROFIT}_{i,t} + \beta_6 \text{DEBT}_{i,t} + \sum \text{YEAR}_{i,t} + \epsilon_{i,t} \quad (2)$$

Mediating equations

$$\text{PERFORMANCE} = \beta_0 + \beta_1 \text{SP}_{i,t} + \beta_2 \text{AGE}_{i,t} + \beta_3 \text{PROFIT}_{i,t} + \beta_4 \text{DEBT}_{i,t} + \sum \text{YEAR}_{i,t} + \epsilon_{i,t} \quad (3)$$

if significant, the following equations will be directed to find the level of mediation,

$$\text{GI} = \beta_0 + \beta_5 \text{SP}_{i,t} + \beta_6 \text{AGE}_{i,t} + \beta_7 \text{PROFIT}_{i,t} + \beta_8 \text{DEBT}_{i,t} + \sum \text{YEAR}_{i,t} + \epsilon_{i,t} \quad (4)$$

TABLE 2 Model summary and ANOVA.^a

Model		Sum of squares	df	Mean square	F	Sig.
ROA						
1	Regression	1.940	3	.647	9.980	.000**
	Residual	1.879	29	.065		
	Total	3.820	32			
	R	.713 ^a				
	R ²	.508				
	Adjusted R ²	.457				
	Std. error of the estimate	.25457				
2	Regression	2.454	4	.614	12.579	.000**
	Residual	1.366	28	.049		
	Total	3.820	32			
	R	.802 ^b				
	R ²	.642				
	Adjusted R ²	.591				
	Std. error of the estimate	.22085				
Tobin's Q						
1	Regression	.723	3	.241	7.628	.001**
	Residual	.916	29	.032		
	Total	1.639	32			
	R	.664 ^a				
	R ²	.441				
	Adjusted R ²	.383				
	Std. error of the estimate	.17771				
2	Regression	.747	4	.187	5.858	.001**
	Residual	.892	28	.032		
	Total	1.639	32			
	R	.675 ^b				
	R ²	.456				
	Adjusted R ²	.378				
	Std. error of the estimate	.17849				

^aPredictors: (constant), AGE, PROFIT, DEBT.

^bPredictors: (constant), AGE, PROFIT, DEBT, SP.

**Significant at $\alpha \leq .01$.

$$PERFORMANCE = \beta_0 + \beta_9 SP_{i,t} + \beta_{10} GI_{i,t} + \beta_{11} AGE_{i,t} + \beta_{12} PROFIT_{i,t} + \beta_{13} DEBT_{i,t} + \sum YEAR_{i,t} + e_{i,t} \tag{5}$$

The study controlled some variables, as guided by previous research. Because older institutions are believed to have a competitive advantage, age (AGE) of the financial institution is taken into consideration as a control variable (Bose et al., 2017). However, higher profitability (PROFIT) could indicate a mature company with limited prospects for growth (Bose et al., 2017; Roll et al., 2009). In addition, the study considered the impact of debt (DEBT) on FP as debt can increase firm risk, which in turn affects FP through the monitoring efforts of debt holders (Roll et al., 2009). According to Muttakin et al. (2015), higher levels of debt have a more significant impact on FP.

3.3 | Hierarchical regression analysis

The study applies hierarchical regression to examine the relationship between SP and FP, using ROA and Tobin's Q as performance indicators. The results of the analysis indicate that the model is statistically significant, and that FP (as measured by ROA and Tobin's Q) is affected by the exogenous variables. Additionally, the control variables (PROFIT and DEBT) and the independent variable SP were found to have a significant impact on FP as measured by ROA.

In order to explore the potential moderation or mediation of GI indicators, the study conducted additional tests. The results from the Tobin's Q model showed that the model is significant, but there was no significant relationship between SP Indicators and FP, making it impossible to test for the moderating or mediating effect of GI indicators, as in Tables 2 and 3.

In more detail, Table 2 also shows the results of the hierarchical regression analysis for ROA as a FP indicator. The R² value, which represents the coefficient of determination, is equal to .508 and .642 for models 1 and 2, respectively. This means that both models explain more than 50% of the variation in ROA. The significance of the F statistic (F = 9.980) with (Prob F = .000) for model 1, and significant for model 2 with the value of F statistic (F = 12.579) and (Prob F = .000), indicates that the effect of SP on ROA is significant. This suggests that there is a significant correlation between Tobin's Q and the control variables (PROFIT and DEBT) in relation to SP.

The results of the analysis indicate that Tobin's Q, as a FP indicator, is partially explained by both models 1 and 2, accounting for less than 50% of the variation. The significance of the F statistic for Model 1 was 7.628 (Prob F = .001), and for Model 2, it was 5.858 (Prob F = .001), indicating a significant effect of the control variables (PROFIT and DEBT) on Tobin's Q. However, the relationship between SP indicators and Tobin's Q was not significant.

These results suggest that profitability and debt have a significant impact on Tobin's Q, but SP indicators did not have a

TABLE 3 Coefficients.*

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Std. error	Beta		
ROA						
1	(Constant)	.835	.188		4.441	.000
	AGE	.000	.004	-.014	-.071	.944
	PROFIT	1.35	.000	2.439	4.901	.000**
	DEBT	-1.485	.000	-2.190	-3.867	.001**
2	(Constant)	.111	.276		.401	.691
	AGE	-.001	.004	-.053	-.297	.769
	PROFIT	1.321	.000	2.387	5.527	.000**
	DEBT	-1.469	.000	-2.166	-4.408	.000**
	SP	.651	.200	.371	3.245	.003**
Tobin's Q						
1	(Constant)	.951	.131		7.252	.000
	AGE	-.002	.003	-.142	-.658	.516
	PROFIT	-8.108	.000	-2.237	-4.217	.000**
	DEBT	1.119	.000	2.519	4.174	.000**
2	(Constant)	.796	.223		3.565	.001
	AGE	-.002	.003	-.155	-.711	.483
	PROFIT	-8.169	.000	-2.253	-4.227	.000**
	DEBT	1.122	.000	2.527	4.168	.000**
	SP	.140	.162	.122	.864	.395

**Significant at $\alpha \leq .01$.

*Significant at $\alpha \leq .05$.

significant impact. Meanwhile, the results of the hierarchical regression analysis indicate that the control variables, PROFIT and DEBT, have a significant effect on both ROA and Tobin's Q in both models. However, AGE was found to have no impact on neither performance indicators. Concerning the independent variable SP, the results show a significant positive effect on ROA, with a coefficient value of .371, which is significant at a t -value of 3.245 and a p -value of .003. On the other hand, SP was found to have no significant effect on Tobin's Q, with a coefficient value of .122 and a t -value of .860, with a p -value of .395.

Based on these results, the study supported the hypothesis that there is a significant relationship between SP and FP of Jordanian Financial Institutions, as measured by ROA, for that further test is applied on ROA and the influence of GI on ROA. However, the hypothesis that there is a significant relationship between SP and FP, as measured by Tobin's Q, is not supported. So no further tests will be done for Tobin's Q.

3.4 | Moderating or mediating effect-path analysis

The results of the Hayes (2013) testing model, as implemented in SPSS 26 version 4.2 beta, provide evidence for the existence of a relationship between the SP and FP, and the role that GI may play as either a moderating or mediating variable. The analysis provides insights into the impact of these relationships and can help inform future research and decision making in the field for ROA as a FP indicator.

3.4.1 | Moderating analysis

The results of the moderating test revealed that GI does not play a moderating role in explaining when the relationship between SP and FP occurs and interactions are examined through moderation analyses. In other words, it is the relationship between X and Y changes

TABLE 4 Model 1: ROA.

	Coeff	SE	t	p	LLCI	ULCI
Constant	9.2785	4.5704	2.0301	.0523	−.0996	18.6565
SP	−6.2609	3.8536	−1.6247	.1158	−14.1680	1.6463
GI	−5.2569	2.7217	−1.9315	.0640	−10.8415	.3277
Int_1	4.2079	2.3036	1.8266	.0788	−.5189	8.9346
AGE	−.0181	.0055	−3.3109	.0026**	−.0293	−.0069
PROFIT	.0043	.0018	2.3912	.0240*	.0006	.0081
DEBT	.0068	.0028	2.3947	.0238*	.0010	.0126
R ²				.6813		
Adjusted R ²				.4641		
F-statistic				3.8972		
Prob × (F-statistic)				.0062**		
Moderating test						
Int_1: SP(X) × GI(W)						
	R ² -chng	F	df1	df2	p	
X × W	.0662	3.3366	1.0000	27.0000	.0788	

**Significant at $\alpha \leq .01$.

*Significant at $\alpha \leq .05$.

TABLE 5 Total effect(s) SP on ROA.

	Coeff	SE	t	p	LLCI	ULCI
Constant	.5481	.3744	1.4640	.1540	−.0880	1.1842
SP	.7579	.3054	2.4813	.0194*	.2383	1.2775
AGE	−.0144	.0052	−2.7849	.0093**	−.0231	−.0056
PROFIT	.0039	.0017	2.3745	.0244*	.0011	.0068
DEBT	.0054	.0027	1.9875	.0564	.0008	.0099
R ²				.6223		
Adjusted R ²				.3872		
F-statistic				4.5812		
Prob × (F-statistic)				.0055**		

**Significant at $\alpha \leq .01$.

*Significant at $\alpha \leq .05$.

	Coeff	SE	t	p	LLCI	ULCI
Constant	1.0511	.8078	1.3013	.2038	-.3230	2.4252
SP	.6509	.2627	2.4778	.0193*	.2046	1.0973
GI	.8223	.3380	2.4325	.0210*	.1328	1.5117
AGE	-.0141	.0052	-2.7076	.0114*	-.0230	-.0052
PROFIT	.0034	.0018	1.8940	.0686	.0004	.0065
DEBT	.0061	.0029	2.0916	.0457*	.0011	.0111
R^2				.6308		
Adjusted R^2				.3979		
F-statistic				3.7005		
Prob × (F-statistic)				.0107*		

*Significant at $\alpha \leq .05$.

as a function of another variable. Although the overall model was significant with a Prob F value of .0062, the explanatory percentage was 68%, the F statistic was 3.8972, and p was .0788.

The control variables, AGE, PROFIT, and DEBT, were found to significantly affect the relationship between the exogenous and endogenous variables at a 5% significance rate. The coefficient value of AGE was $-.0181$ and was significant with a t -value of -3.3109 and a p -value of .0026. The coefficient values for PROFIT and DEBT were .0043 and .0068, respectively, and both were positively significant with t -values of 2.3912 and 2.3947, and p -values of .0240 and .0238, respectively. Meanwhile, the exogenous variable had no significant relationship with the endogenous variable, with a coefficient value of -6.2609 and a t -value of -1.6247 and a p -value of .1158. Tests of the highest order unconditional interaction(s) in Table 4 revealed no relationship between the SP indicators and GI, which failed to let support for the third hypothesis, "There is a moderating effect of GI on the relationship between SP and FP, measured by ROA." However, the fourth hypothesis, "There is a moderating effect of GI on the relationship between SP and FP, measured by Tobin's Q," could not be indicated based on its failure to support H2.

3.4.2 | Mediating analysis

The results of the mediating test conducted using bootstrapping with a confidence interval of 5000, suggest that GI indicators play a mediating role in explaining the relationship between SP indicators and FP. The lower and upper limits of the confidence interval did not intersect with zero, indicating that GI genuinely mediates the correlation between SP and ROA as a FP indicator. The total effect of the relationship between SP and ROA was analyzed, with an R^2 value of 62.2% of the variation explained by the model, as represented in Table 5. The F -statistic had a significant value of ($F = 4.5812$), which was less than or equal to .01, indicating that the influence of the independent variables taken together is significant (Prob $F = 0.0055$). The indirect effect of the regression indicated a significant effect with ($t = 6.4659$) and (p -value = .0008), which is less than 0.01, while the direct effect between the

TABLE 6 Direct effect of SP on ROA.

TABLE 7 Indirect effect(s) of SP on ROA-5000 bootstrap.

	Effect	BootSE	BootLLCI	BootULCI
GI	-.107	.1914	-.3717	.1999

TABLE 8 Analysis summary.

Hypothesis	Result
H1: There is a significant relationship between SP and FP of Jordanian Financial Institutions, measured by ROA.	Accepted
H2: There is a significant relationship between SP and FP of Jordanian Financial Institutions, measured by Tobin's Q.	Rejected
H3: There is a moderating effect of GI on the relationship between SP and FP, measured by ROA.	Rejected
H4: There is a moderating effect of GI on the relationship between SP and FP, measured by Tobin's Q.	Ground of moderation not indicated
H5: There is a mediating effect of GI on the relationship between SP and FP, measured by ROA.	Accepted
H6: There is a mediating effect of GI on the relationship between SP and FP, measured by Tobin's Q.	Ground of mediation not indicated

variables indicated a significant positive effect, where R^2 equals 63% and is significant with ($t = 3.7005$) and (p -value = .0107) as in Table 6.

The results support the acceptance of the fifth hypothesis, which stated, "There is a mediating effect of GI indicators on the relationship between SP and FP, measured by ROA." Both the total effect and direct effect models indicate that the exogenous variable is significant, and its significance decreased after controlling for GI in the direct effect model. The results of the study suggest that the mediation effect of GI on the relationship between the exogenous and endogenous variables was partially accepted. According to the results from Table 7, the lower and upper bounds of the confidence interval



intersect at zero, indicating a partial mediating effect of GI on the relationship between SP and ROA as an FP indicator. However, the hypothesis that GI has a mediating effect on the relationship between SP and Tobin's Q failed to support the relationship, based on the rejection of H2. A summary of all the hypothesis results is provided in Table 8. These findings contribute to the existing literature by offering a deeper understanding of the role that GI indicators may play in explaining the relationship between SP and FP indicators.

4 | DISCUSSION AND CONCLUSION

The findings of this study emphasizes on the significance of incorporating the mediating role of GI in evaluating the relationship between SP and ROA as a FP measurement in the financial sector. Such information can help financial proactively enhance their performance and promote sustainable growth, and inform how and why GI effects such relationship. In recent years, an increasing number of companies have adopted sustainability reporting practices, recognizing the potential benefits of incorporating GI on their performance. Companies often assume that they will enjoy higher returns on their shares and have greater competitive advantage compared to their peers who do not practice sustainability reporting (Al Amosh et al., 2023). The general of relationship between SP and FP is supported by the work of Ahmed et al. (2020) and Hongming et al. (2020), which highlights the growing importance of sustainability reporting at a global level; where the IFRS Foundation pursued support from key stakeholders to serve as a standard-setter for sustainability by disclosing information in the financial reports (IFRS Foundation, 2020). Ilyas and Osiyevskyy (2022) study results also indicated a positive significant effect of SP on FP, as supported in our study. On the other side, and despite the fact that sustainability reports do not cover every aspect of a company's business, some studies concluded that SP has limited impact on FP, as in the findings of Imperiale et al. (2023) and Moodaley and Telukdarie (2023). In depth and after testing the empirical results of studies, as conducted by Buallay (2022b, 2022c) results indicated the influence of sustainability reporting on a company's FP with a positive significant relationship between SP and ROA; where the results supported our study findings. Previous research by Jadoon et al. (2021) indicated that investors value and prefer companies with a high level of sustainability reporting, as it strengthens its ROA, also aligning with the results of our study. However, our results showed that the Tobin's Q is not affected by sustainability reporting and no significant relationship was found, as in (Al Amosh et al., 2023). On the contrary of Ilyas and Osiyevskyy (2022) study results.

One of the ways companies can strive for sustainability is through the utilization of natural resources in a responsible manner, ethical waste management, the adoption of renewable energy sources, the influence of global norms, and updating measurement models mainly in developing countries, (Dissanayake et al., 2021; Padilla-Lozano & Collazzo, 2021) as Jordan. These practices aim to minimize the adverse effects on the environment and support a sustainable future to companies by improving their performance (Majid et al., 2022). The

quantification of the impact of cost-effective innovations (Ai Ping & Al-Okaily, 2023; Ai Ping et al., 2023; Al-Okaily et al., 2023) on economic, environmental, and social sustainability results can provide insights into innovations to drive positive SP outcomes (Buallay et al., 2020; De Marchi et al., 2022; Saeidi & Othman, 2017; Wang & Sarkis, 2017). In addition, Tarquinio and Xhindole (2022) added that academia has the potential to translate research-generated knowledge into useful information for managing and disclosing sustainability challenges.

The study investigated the moderating effect of the GI on the relationship between sustainability and ROA performance measurement in Jordanian financial companies. The results demonstrate a moderating influence of GI on this relationship, in accordance with the conclusion of Mengistu and Panizzolo (2022) the indicators used to evaluate progress toward industrial sustainability goals were selected based on their ability to improve financial benefits, decrease expenses, increase market competitiveness, enhance resource utilization efficacy, and promote stakeholder well-being. However, while stakeholders with non-contractual relationships to businesses have a positive impact on GIs, governmental administrations can have a detrimental effect, hindering businesses' efforts to implement GI (Srouji et al., 2023; Thomas et al., 2021). The findings, nonetheless, indicate that the level of development of the GI can support high-quality economic performance (Alsmadi et al., 2023; Khairunnessa et al., 2021; Xu & Gao, 2022). However, the GI in Jordanian financial sector verified none of these indicators. Given the pressing need to address global warming and establish a more sustainable society, it is crucial for governments, corporations, and individuals to take an active role, and focus more on the implementation of both financial and non-financial disclosure. As for the financial industry, in particular, plays a vital role in this endeavor, as it helps to create a strong and prosperous low-carbon economy. When making lending and investment decisions, financial institutions may need to consider non-financial data more (Alshawish et al., 2015; Hamdallah, Srouji, & Al-Ibbini, 2022) to improve their performance and support sustainable business growth.

However, the authors note that sustainability reporting only improves companies' market success to a certain extent and that there are also costs associated with this practice, which can affect a company's overall performance value as in Bansal et al. (2021) and Srouji et al. (2015). According to Tenuta and Cambrea (2022), increased commercial opportunities, premium pricing, and personnel attraction are further benefits of evaluating sustainability. This supports the notion that a positive correlation between sustainability evaluation and firm value can be achieved if a company publishes a high-quality sustainability initiative report. This, in turn, increases the firm value and the number of investors (Bartlett, 2012; Hamad & Yassin, 2022; Kuzey & Uyar, 2017). This study originality comes from the insights into the relationship between SP and FP and then tests how GI influences that relationship in an emerging economy, either in a moderating or mediating manner. In Jordan, where global integration is occurring more quickly and competition is more intense than ever before, the contribution of our study is even more significant.

5 | LIMITATIONS AND RECOMMENDATIONS

The current non-financial reporting standards have sparked conflict due to their nature, in relation to financial companies. Despite being a step toward improving transparency and highlighting the impact of a company's operations on sustainability issues (Baumüller & Sopp, 2021), the results of the study present contradictory conclusions, importance that still needs further investigation. The limitations of the study include the selection of indicators and the short time frame of the analysis, and shortage of data on sustainability indicators applied by ASE companies, and the small sample size may limit the generalizability of the findings.

The study's additional perspective on the issue provides valuable insights into the interplay between FP and SP and highlights the need for a more comprehensive approach to measuring SP. Future research should focus on the characteristics of managers and stakeholders as in (Hamdallah et al., 2021) the disclosure of green data, and SP. A comprehensive and impartial set of evaluation criteria for green initiatives needs establishment through further research. The suggested framework can be tested through case studies using an action research methodology. Studies on businesses that do not disclose non-financial information, such as the majority of industrial companies in Jordan, could be conducted to provide quantitative validation of the framework, maybe due to the limited number of managers knowledgeable and interested in sustainability. Therefore, companies should enhance the transparency of non-FP reporting. The inclusion of board of directors' characteristics can contribute to the coherence between the words and actions in the presentation of non-financial information disclosure; as they can encourage companies to provide more information about sustainable development and green initiatives.

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This article does not contain any studies with human participants or animals performed by any of the authors.

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