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Environmental, Social, and Governance (ESG) Performance and Corporate Resilience: An Analysis of Saudi Listed Companies

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Abstract

This research investigates the impact of environmental, social, and governance (ESG) performance on the resilience of non-financial listed firms in Saudi Arabia. The analysis is based on a sample of 128 firms from 2014 to 2023 and employs a fixed-effects regression approach. The results indicate that ESG performance is positively and significantly associated with corporate resilience, as predicted by stakeholder and legitimacy frameworks. Thus, the findings suggest that a commitment to ESG can strengthen a firm's competitive advantage and enhance revenue generation for long-term sustainability, thereby contributing to corporate resilience. This result remains consistent across alternative measures of corporate resilience and after controlling for potential endogeneity. The evidence has implications for policymaking, particularly in developing additional guidelines on the benefits of ESG reporting. The findings can support compliance with the Sustainable Development Goals (SDGs), which emphasise a multi-stakeholder perspective on corporate sustainability and long-term value creation. Overall, the results provide managers and policymakers with new strategies to enhance corporate stability and sustainable management amid volatile market conditions.

Keywords: ESG practices; corporate resilience; corporate survival; SDGs; Saudi listed firms

JEL: G32, M14, Q56, C23, L25

1. Introduction

The United Nations Sustainable Development Goals (SDGs) emphasise the importance of corporate sustainability management for economic prosperity. In particular, SDG-17 focuses on the contributions of nations, corporate organisations, and other stakeholders to achieving the sustainable development agenda. SDG-17 encourages firms to prioritise partnership with relevant stakeholders and factor sustainable management practices into their financing and investment decisions (Wu et al., 2024; Zahid et al., 2022). Hence, SDG-17 provides the framework and motivates firms to pay greater attention to a multi-stakeholder approach in decision-making processes for corporate survival. Environmental, social, and governance (ESG) performance refers to the non-financial impact of organisations on the social issues, environment and governance (Alareeni and Hamdan, 2020). There is growing attention among academics, regulators, and investors regarding ESG practices, as they are a crucial factor in evaluating corporate performance (Wu et al., 2024). Sound ESG practice can lessen business risks concerning social issues, environment, and ineffective governance. Studies have stated that ESG considerations can enhance corporate legitimacy and improve an organisation's image, thereby helping firms gain greater competitive advantage (Oware et al., 2023; Zahid et al.,

2022). Drawing on stakeholder, legitimacy, and agency frameworks, ESG practices can impact the resilience of firms. These perspectives suggest that ESG commitment can enhance firms' goodwill, attract investors, and foster a more stable financial system, thereby contributing to corporate resilience (Lv et al., 2019; Marcon Nora et al., 2023).

In recent times, corporate resilience has received many considerations from regulators, academics and investors due to evolving market conditions, changes in environmental needs, technological advancements, and regulatory upheavals (Al-Hakimi et al., 2022; Croci et al., 2024). Resilience is the ability to take preventive measures to cope with a crisis or risk. Some organisations exhibit greater resilience in adverse environmental conditions and endure crises through robust risk management strategies, flexible structures, and adaptive leadership (DesJardine et al., 2019; Wang et al., 2023b). There is compelling evidence that resilient organisations possess the capacity to adapt to market shifts, making them more likely to remain relevant and responsive to dynamic market changes (Cheong, 2021; Lodorfos et al., 2023). Effective risk management and the ability to sustain growth during crises have emerged as critical concerns for achieving long-term success.



Empirical literature dwells more on the influence of ESG on organisational outcomes, such as financial reporting quality, capital costs, and firm value, ignoring corporate resilience (Alareeni and Hamdan, 2020; Aydoğmuş et al., 2022; Selim and Alshareef, 2025; Zahid et al., 2022; Zhang and Guo, 2024). The motivation for this research is the insufficient empirical evidence on the effect of ESG performance on corporate resilience. This subject is crucial because businesses are likely to experience turbulent market conditions, shocks, and other unexpected disruptions that can threaten their long-term survival and continuity. Few studies have explored the influence of ESG on resilience, and most have focused on the US and China (DesJardine et al., 2019; Wang et al., 2023a). Therefore, this research examines the relationship between ESG performance and corporate resilience in the Saudi context. Saudi Arabia's corporate sector prioritises sustainable practices, such as carbon footprint reduction, renewable energy approach, and other green initiatives, supporting with international agenda to achieve Vision 2030. The Vision 2030 focuses on policy initiatives to reduce international trade barriers and attract foreign capital for a resilient economy. Resilience initiatives are crucial for the Saudi corporate environment, given the country's institutional plan for sustainable development. Therefore, ESG practices may potentially enable the Saudi corporate sector to achieve long-term sustainability, paving the way for resilience and achieving Vision 2030.

This research offers further insights by examining how ESG performance impacts corporate resilience. This exploration offers a novel perspective on the factors that contribute to corporate survival. This study addresses an under-researched area and provides a deeper understanding of the determinants of corporate resilience in developing countries. This study also unveils new perspectives and contributes to theories. It combines insights from stakeholder, agency, and legitimacy frameworks to evaluate the effect of ESG performance on corporate resilience. This endeavour extends the application of these frameworks to organisational behaviour. The research outcomes impact policy-making, especially by informing the development of additional regulations on the benefits of ESG reporting. The finding underscores the importance of stakeholder engagement in enhancing corporate sustainability. This aligns with the Sustainable Development Goals (SDG-17) and provides additional insights for boosting environmental, social, and governance performance, thereby achieving firms' long-term success and resilience. The outcomes of this research may equip managers and policymakers with new strategies to enhance economic stability and promote corporate sustainability amid volatile market conditions. The result implies that ESG practices can reduce environmental risks, improve governance, and boost long-term growth. This effectiveness can make the Saudi corporate sector attractive to foreign investors, aligning with the Saudi Vision 2030.

The remainder of this paper is organised as follows: The next segment contains the literature review. The third and fourth sections explain the methodology and discussion of the empirical evidence followed by robustness analysis. The last section concludes the paper.

2. Literature Review

2.1 Theoretical Framework

Stakeholder theory provides a framework for viewing the nexus between ESG performance and corporate resilience. This theory suggests that firms do not operate in isolation, but instead are embedded within networks of diverse stakeholders, including the operating environment, employees, customers, and regulators (Adeyemi, 2019; Freeman, 1994). These stakeholders expect corporate bodies to factor their concerns into long-term decision-making for sustainability. According to this perspective, companies that are committed to addressing stakeholders' interests are more likely to have higher goodwill, trust, and recognition (Marcon Nora et al., 2023; Wu et al., 2024). This theory suggests a positive relationship between ESG performance and corporate resilience. Companies with sound ESG practices experienced higher sales growth during economic uncertainty because stakeholders perceived such firms as trustworthy and reliable (Adeyemi, 2019; Alareeni and Hamdan, 2020). Sustainable practices, such as good governance, ethical labour regulation, and environmentally friendly policies, foster strong relationships with stakeholders and maintain competitive relevance. This theory views ESG commitment as a mechanism for gaining recognition and assurances from the operating environment, customers, and employees, thereby enabling organisations to maintain stable operations, including consistent sales growth (Aydoğmuş et al., 2022; Wu et al., 2024). This achievement can motivate firms to be more innovative in sustaining smooth relations with stakeholders and enabling them to cope with evolving market conditions, leading to greater resilience.

Legitimacy theory is another perspective that supports ESG commitment as a mechanism for building corporate resilience. This framework posits that a social contract exists between firms and society, and therefore, companies should engage with society to gain acceptance and recognition (Githaiga and Kosgei, 2023; Michelon and Parbonetti, 2012). ESG practices help align corporate organisations with social norms and values, demonstrating a commitment to societal needs and helping firms secure consistent support from society and the public (Garas and ElMassah, 2018). Society perceived that companies with higher ESG performance are associated with good governance. This positive outlook can raise firms' goodwill, attract investors, and foster a sound financial system for long-term growth, thereby contributing to corporate resilience (Cheong, 2021; Croci et al., 2024). Hence, this theory posits that ESG commitment enables firms to align with societal needs and ex-

pectations, thereby fostering trust and paving the way for long-term growth and resilience.

The relationship between ESG performance and corporate resilience can be viewed through the lens of agency theory. This theory emphasises that firms suffer agency conflicts due to the divergent views between managers and shareholders (Jensen and Meckling, 1976; Mustapha and Che Ahmad, 2011). Based on this framework, if agency conflict is not controlled through stringent oversight and monitoring, value maximisation and firms' sustainability can be undermined. Good governance and other sustainable practices promote transparency and accountability, raising corporate image and building trust (Dwekat et al., 2025). Agency theory suggests that strong governance, facilitated by a wide range of control and incentive mechanisms, can compel managers to prioritise environmental and social commitments (Khatib and Al Amosh, 2023; Sani, 2020; Sani et al., 2020). This endeavour can enable firms to strengthen customer loyalty, gain a competitive advantage, and improve sustainability, thereby bolstering long-term resilience (Crocì et al., 2024; Lv et al., 2019). Therefore, this theory assumes a positive relationship between ESG performance and corporate resilience, as strong governance can mitigate shocks amid external uncertainties.

2.2 Empirical Review and Hypothesis Formulation

ESG Performance and Corporate Resilience

ESG performance signifies a company's commitment to ethical practices, good governance, and environmental considerations. Corporate resilience is the ability of an organisation to adapt, thrive, and overcome challenges and disruptions arising from environmental changes or evolving market conditions (Cheong, 2021; Crocì et al., 2024). It has been argued that stronger ESG initiatives can build stakeholder trust and enhance a firm's reputation by demonstrating a commitment to ethical practices and environmental sustainability (Habbash, 2016; Yang et al., 2018). Prior studies have also found that companies with strong ESG records enjoy a competitive advantage and attract more investors who prioritise sustainable investment. This can improve a firm's image and goodwill, and is adaptable to stakeholders' needs, leading to long-term success. Another stream of empirical evidence suggests that prioritising ESG demonstrates a firm's alignment with social and environmental norms, thereby legitimising its operations (Khatri, 2023; Nguyen et al., 2020; Qasem et al., 2024). This legitimacy can help companies mitigate environmental risks that may constrain corporate sustainability and resilience. Another stream of studies has reported that ESG performance signals firms' commitment to environmental needs (Shan et al., 2024; Wu et al., 2024). This alignment can narrow the information asymmetry between managers and stakeholders, reducing agency conflicts and promoting long-term success. Consistent with agency theory, robust and strong internal governance can strengthen firms' internal control

and enhance oversight (Alareeni and Hamdan, 2020; Zahid et al., 2022). This effectiveness can mitigate operational risks, improve decision-making processes that navigate dynamic and environmental changes, and foster sustainable growth and resilience (Cheng et al., 2023; DesJardine et al., 2019; Lv et al., 2019; Wang et al., 2023b).

Conversely, some empirical evidence suggests that ESG practices can result in higher operational costs and reduce a portion of firms' profits, limiting their ability to invest in new projects (Lv et al., 2019; Oware et al., 2023). It has also been stated that managers may indulge in risky investment in the name of ESG, leading to more agency conflicts and reduce firm value (Chu et al., 2023; Cordeiro et al., 2021).

Conclusively, prior studies have established that board governance and firm-level attributes can influence corporate resilience (Cheng et al., 2023; DesJardine et al., 2019; Lv et al., 2019). However, few empirical studies investigated the nexus between ESG performance and corporate resilience (DesJardine et al., 2019; Wang et al., 2023a). These studies have argued that companies that prioritise ESG activities can enjoy a better brand name and goodwill, resulting in higher competitive advantage. A greater competitive edge can raise sales growth and stabilise financial returns, enabling firms to withstand market shocks and build resilience. This study relies on the prior empirical evidence and the theoretical predictions to design the framework in Fig. 1 and develop the hypothesis:

H: There is a positive relationship between ESG performance and firms' resilience of Saudi listed companies.

3. Methodology

3.1 Sample and Data Sources

The research purposively selected 128 non-financial listed firms from the Saudi stock market between 2014 and 2023. The total number of listed firms is 238, and criteria were established to select the sampled companies. Firms in the financial sector were excluded due to their unique regulations and requirements (Alshareef and Sulimany, 2024; Sulimany, 2023). Firms without the required ESG data, as per the Bloomberg database, and newly established companies were excluded. The criteria were developed to enable the study to generate the needed data for analysis. The data from the sampled firms were generated from various sources. The data on the firm-level indicators were obtained from the Eikon databank. The board governance-related data were gathered from annual reports and information available on the Saudi Stock Exchange (Tadawul) website.

3.2 Variables of the Study

3.2.1 Explanatory Variable

The major explanatory variable is the ESG score, obtained from the Bloomberg database. These ESG scores appear reliable because the assessment employs a multidimensional

H: Stakeholder, legitimacy and Agency theories

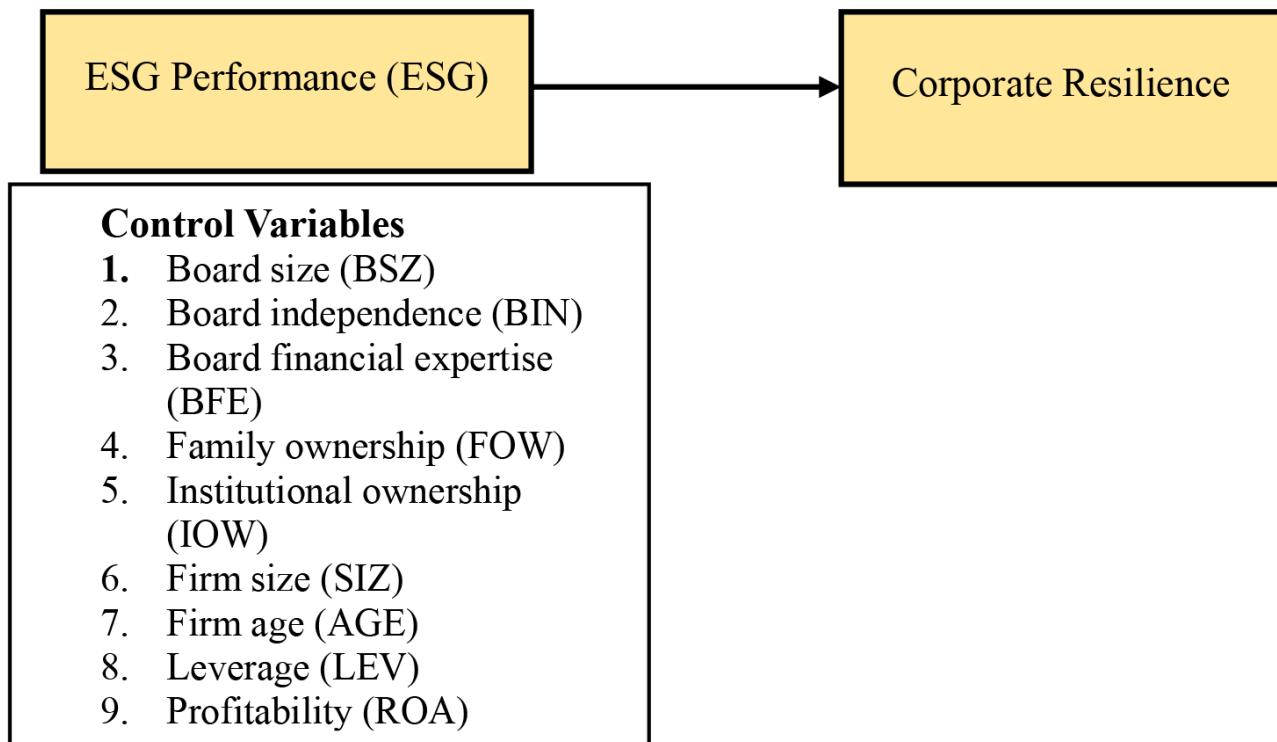


Fig. 1. Research framework. ESG, environmental, social, and governance; H, hypothesis.

dimensional methodology that considers several financial and non-financial indicators related to sustainability reporting. The Bloomberg ESG score is widely used in prior studies on finance and accounting (Alareeni and Hamdan, 2020). The index ranges from 0 to 100 per cent, with higher scores indicating higher performance levels, and vice versa.

3.2.2 Dependent Variable

The dependent variable is corporate resilience, operationalised as long-term sales growth (LSG). This measurement reflects a company's ability to consistently generate revenue over a long period, demonstrating resilience (Cheong, 2021). Prior studies have used this proxy as a measure of corporate resilience because consistent sales over a long period imply a firm's capability to endure amid evolving market conditions (DesJardine et al., 2019; Lv et al., 2019). It refers to the ability to adopt and thrive in the face of disruptions and challenges for long-term success.

3.2.3 Control Variables

This research incorporated some board governance attributes, ownership structure, and firm-level indicators as control variables in the specified model. The board attributes included are board size (BSZ), board independence (BIN), and board financial expertise (BFE). It has been ar-

gued that a smaller board size facilitates strong monitoring due to greater cohesion and lower conflicts (Crocì et al., 2024; Min, 2018). This effectiveness can enable firms to achieve superior decision-making quality, guaranteeing long-term success and resilience. The literature has emphasised that boards with a significant ratio of independent board members can enjoy sound monitoring and advice (Muniandy and Hillier, 2015; Wu et al., 2024). Better guidance can help firms adapt to evolving market conditions, contributing to their resilience. BFE is regarded as a crucial mechanism because it facilitates effective oversight and provides valuable insights that strengthen board governance (Lee et al., 2024). Financial expertise can help ensure effective risk management and the development of a robust financial system, contributing to long-term performance and resilience (Crocì et al., 2024).

Regarding ownership structure, this study employed family ownership (FOW) and institutional ownership (IOW). FOW can significantly contribute to corporate resilience, as these investors aim to preserve business goodwill (Alshareef and Sulimany, 2024; Baek et al., 2016). They prioritise firm value maximisation for future generations, enabling family-owned companies to focus more on long-term success. Institutional investors closely monitor managers, thereby mitigating agency conflicts and enhanc-

Table 1. Measurements of the variables.

Variable	Abbreviation	Measurement
Dependent variable:		
Corporate resilience	LSG	Cumulative sales growth for 3 years.
Main explanatory variable:		
Environmental, social and governance (ESG) performance	ESG	The Bloomberg ESG disclosure score.
Control variables:		
Board size	BSZ	The number of board members.
Board independence	BIN	The number of independent directors over the total number of board members.
Board financial expertise	BFE	Number of directors with at least a bachelor's degree in finance and accounting over the total board members.
Family ownership	FOW	The percentage of shares held by the family.
Institutional ownership	IOW	The number of equity shares held by institutions is divided by the total number of equity shares.
Firm size	SIZ	The logarithm of the sampled company's total assets.
Firm age	AGE	Number of years listed as at the observation year.
Leverage	LEV	Total debt over total assets.
Profitability	ROA	Operating profits divided by total assets.

LSG, long-term sales growth.

ing internal governance (Cordeiro et al., 2021; Sulimany, 2023). Companies with substantial IOW can be associated with robust monitoring, which paves the way for long-term success and resilience.

Concerning firm-level variables, this study incorporated firm size (SIZ), firm age (AGE), leverage (LEV), and profitability (ROA). Studies have reported that larger and older companies derive several advantages, such as economies of scale, diversified income streams, and abundant resources (Shakil et al., 2024; Sunny and Hoque, 2025). These benefits can enable larger and older companies to withstand shocks and uncertainties amid evolving market conditions, building resilience. Hence, SIZ and AGE are positively associated with resilience. LEV can constrain resilience by raising a firm's risk profile and increasing the likelihood of financial distress, thereby limiting its ability to respond to financial uncertainties (Dwekat et al., 2025). These conditions can make a firm vulnerable to evolving market conditions and negatively impact resilience (Crocì et al., 2024; Wang et al., 2023a). The literature suggests that profitable companies tend to build buffers against shocks, enabling them to maintain their operations and swiftly adapt to changes in market conditions (Lee et al., 2024; Shan et al., 2024). Hence, as ROA increases, corporate resilience may increase. The measurements of these variables employed are reported in Table 1.

3.3 Analytical Model

This section discusses the analytical approach this study utilised to ascertain the relationship between ESG performance and corporate resilience. The sampled data comprised observations from 128 companies spanning 2014 to 2023, making it more suitable to employ a panel

data methodology (Alshareef and Sulimany, 2024; Pesaran, 2015). It is an analytical method that analyses multiple events across many firms over different periods (Baltagi, 2005). The technique produces reliable, consistent empirical results and controls for multicollinearity. This research employed pooled Ordinary Least Squares (OLS) regression, a basic analytical tool used to estimate relationships among variables. Moreover, the Hausman test was used to get additional method for analysis. The test results reveal a significant p -value ($p < 0.001$), indicating the suitability of the fixed effects framework for this research (Wooldridge, 2002). The fixed effects model provides more consistent and robust regression results because it accounts for firms' specific attributes. The basic format of the models is as follows:

$$y_{it} = \varnothing + \beta\delta_{it} + \varepsilon_{it} \quad (1) \text{ OLS}$$

$$y_{it} = \varnothing + \beta\delta_{it} + \mu_i + \varepsilon_{it} \quad (2) \text{ Fixed effects}$$

4. Results and Discussion

4.1 Descriptive Analysis

The results in Table 2 provide a descriptive analysis of the research variables. Long-term sales growth (LSG) averages 0.296, suggesting cumulative sales growth of 29.6 per cent across the sampled companies. This variable exhibits a low standard deviation, indicating minimal variation among firms. The Environmental, Social, and Governance (ESG) index averages 29.26 and ranges from 2.142 to 63.011 during the study period. The board size (BSZ) ranges from a minimum of three directors to a maximum of thirteen directors. The proportion of independent directors (BIN) indicates a mean of 0.216. This ratio suggests that, on average, 21.6 per cent of the directors are independent board members. The ratio of finance and accounting specialists

(BFE) averages 0.628, with a minimum and maximum ratio of 0.120 and 0.860, respectively. The average value of BFE indicates that 62.8% of directors on boards are finance and accounting experts.

Table 2. Descriptive statistics.

Variable	Mean	Std. Dev.	Min.	Max.	Observations
LSG	0.296	0.339	−1.270	2.173	1280
ESG	29.264	12.096	2.142	63.011	1280
BSZ	8.452	1.483	3.000	13.000	1280
BIN	0.216	0.034	0.144	0.261	1280
BFE	0.628	0.178	0.120	0.860	1280
FOW	0.531	0.242	0.000	0.891	1280
IOW	0.028	0.046	0.000	0.213	1280
SIZ	9.921	0.726	7.381	12.418	1280
LEV	0.252	0.196	0.000	0.828	1280
AGE	27.173	13.817	2.000	64.000	1280
ROA	0.076	0.0539	−0.151	0.177	1280

Refer to Table 1 for the definitions of the variables. Std. Dev, Standard deviation.

The family ownership (FOW) and institutional ownership (IOW) variables indicate average shareholdings of 53.1 per cent and 2.8 per cent, respectively. The firm size (SIZ) ratio ranges from 7.381 to 12.418. Leverage (LEV) recorded an average of 25.2 per cent and a maximum of 82.8 per cent. The mean value of LEV suggests that, on average, 25.2 per cent of the firm's capital represents borrowings. Firm age (AGE) has an average of 27.173 years, ranging from 2 to 64 years. The profitability indicator (ROA) exhibits little disparity among the firms in the panel, with a mean of 7.6%.

4.2 Correlation Analysis

A correlational method was used to assess the bivariate relationship between the variables in our panel. These outcomes are contained in Table 3. It was found the degree of the correlations between the variables is not up to the 80 percent limit specified by the literature. This evidence suggests that there is no multicollinearity in the panel (Alshaer and Sulimany, 2024; Pesaran, 2015). Further, evidence from variance inflation factor (VIF) ratios is all below 10, reinforcing that there are no high correlations in the specification.

4.3 Regression Results

The sampled data were subjected to basic preliminary tests for multicollinearity, heteroscedasticity, and autocorrelation. The multicollinearity test, using the variance inflation factor (VIF), yields values ranging from 1.01 to 2.61. This evidence suggests that multicollinearity is absent in the model (Baltagi, 2005). The Breusch–Pagan test was employed to test for heteroscedasticity, and the results indicate heteroscedasticity. The outcome suggests

that heteroscedasticity is present in the model (Baltagi, 2005; Pesaran, 2015). The serial correlation result from the Wooldridge LM test shows a significant p -value, revealing the presence of serial correlation in the model (Drukker, 2003). This study uses robust regression to mitigate these statistical issues, as suggested by the literature (Drukker, 2003; Hoechle, 2007).

Table 4 presents the OLS and fixed effects regression results on the effect of ESG performance on corporate resilience. Based on the results, the two models produced R-squares of 47.97% and 49.24%, indicating that the explanatory variables exert influence on the dependent variable. The F-statistics of these models appear significant, showing the robustness of the stated models. The fixed effects regression results reveal a significant positive relationship between ESG performance and corporate resilience, confirming the main hypothesis. The economic effect of this outcome is that a 1% increase in ESG performance can increase corporate resilience by 0.079%. This positive effect supports stakeholder, legitimacy, and agency views that ESG commitment can raise firms' reputations, mitigate environmental risks, and lower agency conflicts, boosting long-term success and resilience. The evidence supports prior studies that have found that companies with strong ESG records enjoy environmental legitimacy and a competitive advantage, thereby contributing to resilience (Khattri, 2023; Nguyen et al., 2020; Qasem et al., 2024). The finding implies that managers can utilise ESG practices to navigate evolving market conditions and sustain their businesses. The outcome can encourage regulators to emphasise ESG practices for corporate survival and resilient operations.

Regarding the control variables, board size is inversely related to corporate resilience at the 1% significance level. The result supports the argument that larger boards are prone to conflicts due to misunderstandings among board members (Crocì et al., 2024; Min, 2018). This conflict can weaken decision-making processes, threatening long-term sustainability and resilience. However, the results suggest that board independence strongly influences corporate resilience. This evidence aligns with prior studies that reported that independent board members can influence organisational outcomes through stringent monitoring and advice (Muniandy and Hillier, 2015; Wu et al., 2024). This robust guidance can help shape internal governance and inform strategies for managing evolving market conditions and other uncertainties. Likewise, board financial expertise is positively related to corporate resilience at the 5% significance level. The outcomes imply that firms with a higher ratio of financial experts on their boards are likely to have a more robust governance that can effectively manage risk and build a sound financial system, guaranteeing long-term success and resilience (Crocì et al., 2024; Lee et al., 2024). The coefficient for family ownership is positively associated with corporate resilience at the 1% sig-

Table 3. Correlation matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	VIF
(1) LSG	1.000											
(2) ESG	0.126***	1.000										1.09
(3) BSZ	−0.250***	0.021	1.000									1.12
(4) BIN	0.582***	0.015	0.020	1.000								1.02
(5) BFE	0.116***	−0.021	0.117***	0.013	1.000							1.01
(6) FOW	0.152***	−0.076	0.118***	0.014	0.014	1.000						2.61
(7) IOW	0.049	−0.032	−0.072**	0.017	0.032	−0.019	1.000					1.67
(8) SIZ	0.093**	0.136***	0.128***	0.027	0.015	−0.247***	−0.4732	1.000				1.87
(9) LEV	−0.147***	0.060	−0.069*	−0.037	−0.045	0.144***	0.048	0.242***	1.000			2.59
(10) AGE	−0.067*	−0.109**	−0.064	0.017	−0.049	0.121***	0.023	0.196***	0.091**	1.000		1.15
(11) ROA	0.066*	−0.056	0.019	0.014	−0.005	−0.051	0.021	0.006	−0.028	0.009	1.000	1.02

*, ** and *** show significance level at 10%, 5% and 1%, respectively.

Refer to Table 1 for variable definitions. VIF, variance inflation factor.

Table 4. Regression results on the effect of ESG performance on corporate resilience.

Variables	Model 1	Model 2
	OLS	Fixed effects
Constant	0.4839** (0.2407)	1.3249** (0.6592)
ESG	0.0113*** (0.0471)	0.079** (0.0499)
BSZ	−0.0385*** (0.0111)	−0.0529*** (0.0162)
BIN	6.9011*** (0.4349)	6.7408*** (0.4407)
BFE	0.0956** (0.0483)	0.1309** (0.0632)
FOW	0.0073** (0.0035)	1.1659*** (0.0659)
IOW	0.0439 (0.3884)	0.8806 (1.7071)
SIZ	0.0893*** (0.0272)	0.0229** (0.0119)
LEV	−0.1805 (0.1243)	−0.2499 (0.1887)
AGE	0.0024* (0.0012)	0.0068*** (0.0066)
ROA	0.7170** (0.2772)	0.3945 (3.937)
Year dummies	Yes	Yes
Sector dummies	Yes	Yes
R ²	0.4797	0.4924
F-statistics	31.06	37.12
Prob > F	0.000	0.000

*, ** and *** show significance level at 10%, 5% and 1%, respectively.

Refer to Table 1 for variable definitions.

Numbers in parentheses are standard errors robust to heteroscedasticity.

nificance level. This finding confirms the proposition that these shareholders prioritise goodwill preservation, thereby focusing on firm value maximisation and resilience (Alsha-reef and Sulimany, 2024; Baek et al., 2016). The coefficients for firm size and firm age indicate positive effects on corporate resilience at the 5% and 1% significance levels, respectively. The outcomes confirm that larger and older firms tend to derive several benefits and resources, thereby enabling them to withstand shocks and uncertainties amid evolving market conditions and build resilience (Shakil et al., 2024; Sunny and Hoque, 2025).

4.4 Robustness Checks

4.4.1 Endogeneity Treatment

This study conducted further analysis to address potential endogeneity between ESG performance and corporate resilience, and the results are presented in Table 5. Specifically, two-stage least squares and two-step system Generalised Method of Moments (GMM) estimation were used to confirm the earlier results reported in Table 4. These analytical tools use instrumental variable regression to mitigate endogeneity between variables, producing robust standard errors (Özer et al., 2024; Zhang and Guo, 2024). The results conform to the underlying assumptions of these analytical frameworks. The Sargan/Hansen tests, which assess the validity of the instruments, yield nonsignificant *p*-values, indicating valid estimations. The second-order autocorrelation (AR2) in the GMM specification indicates no second-order autocorrelation. The evidence from Models (3) and (4) suggests a significant positive relationship between ESG performance and corporate resilience, confirming the outcome in Table 4.

4.4.2 Alternative Measure of Firms' Resilience

A different measure of corporate resilience was used for further robustness tests. The outcome is reported in Table 6, using stock return volatility (SRV) as a proxy for resilience, which was computed as the standard deviation of a

Table 5. Regression results on the effect of ESG performance on corporate resilience.

Variables	Model 3	Model 4
	2SLS	2-step system GMM
Constant	1.4167*** (0.5183)	2.4084*** (0.2129)
LSG _{i,t-1}	—	0.0669*** (0.0097)
ESG	0.0191*** (0.0008)	0.0013** (0.0007)
BSZ	−0.0647*** (0.0201)	−0.0406*** (0.0136)
BIN	6.6797*** (0.9811)	6.2301** (2.5852)
BFE	0.0274* (0.0167)	0.0288*** (0.0110)
FOW	0.2964*** (0.1105)	0.0814*** (0.0128)
IOW	0.1927 (0.6493)	0.3460 (1.9988)
SIZ	0.0266*** (0.0091)	0.0886** (0.0366)
LEV	−0.0904 (0.1469)	−0.1701 (0.7949)
AGE	0.0023 (0.0111)	0.0034 (0.0198)
ROA	0.6799** (0.3032)	0.5862** (0.2484)
Year dummies	Yes	Yes
Sector dummies	Yes	Yes
AR1	—	0.007
AR2	—	0.317
Wu–Hausman Hansen/Sargan	0.687 0.329	— 0.229

*, ** and *** show significance level at 10%, 5% and 1%, respectively.

Refer to Table 1 for variable definitions.

Numbers in parentheses are standard errors robust to heteroscedasticity. 2SLS, two-stage least squares; AR1, first-order autocorrelation; AR2, second-order autocorrelation.

firm's monthly stock returns. This measurement indicates how a firm's stock price reacts to market shocks, demonstrating its adaptability to evolving market conditions and its response to uncertainties (DesJardine et al., 2019; Lv et al., 2019). This study expects ESG performance to be negatively related to SRV because lower SRV implies lower volatility, indicating greater resilience. The results were re-computed using the OLS estimator and fixed effects. The results show that ESG performance has a strong negative influence on stock return volatility, serving as a proxy for firm resilience. Hence, the evidence aligned with prior findings in Tables 4,5.

Table 6. Regression results on the effect of ESG performance on corporate resilience (stock return volatility).

Variables	Model 5	Model 6
	OLS	Fixed effects
Constant	20.5312*** (6.7404)	38.4697** (19.2699)
ESG	−0.0080*** (0.0025)	−0.0209*** (0.0044)
BSZ	0.8311*** (0.2366)	0.6466*** (0.2409)
BIN	−15.1896** (7.9113)	−7.4273*** (3.8684)
BFE	−0.7766* (0.4818)	−0.0693* (0.0425)
FOW	−0.9138* (0.5021)	−2.6681*** (0.9845)
IOW	1.0878 (8.2892)	12.6106 (17.4509)
SIZ	−3.7775*** (0.5799)	−1.6602** (0.8647)
LEV	7.1070*** (2.6544)	0.6116 (1.2887)
AGE	−0.0540** (0.0270)	−0.1528* (0.0833)
ROA	−1.5196 (5.9147)	−2.7703 (2.9117)
Year dummies	Yes	Yes
Sector dummies	Yes	Yes
R ²	0.3576	0.1987
F-statistics	21.19	19.84
Prob > F	0.000	0.000

*, ** and *** show significance level at 10%, 5% and 1%, respectively.

Refer to Table 1 for variable definitions.

Numbers in parentheses are standard errors robust to heteroscedasticity.

4.4.3 Further Robustness Test

Additional robustness analysis was carried out to evaluate the effect of each ESG component on corporate resilience, and the results are reported in Table 7. The OLS regression method was applied using the long-term sales growth (LSG) as the dependent variable. In these results, Model 7 is on the environmental (EV) component, while models 8 and 9 contain the estimates of the social (SO) and governance (GO) impacts, respectively. Interestingly, the coefficients of all three dimensions of ESG exhibited a positive outcome. These findings validate the earlier results on the positive effect of ESG on corporate resilience. For instance, the evidence in the Model 7 implies that sound environmental practices can lower operational risk and mitigate market uncertainties due to higher reputation. These positive outcomes ensure steady sales growth and make companies resilient to market volatility.

Table 7. Regression results on the impact of each ESG component on corporate resilience.

Variables	Model 7 Environmental (EV)	Model 8 Social (SO)	Model 9 Governance (GO)
Constant	0.7547** (0.2929)	0.6940*** (0.2494)	0.7029*** (0.2199)
EV	0.0535*** (0.0102)	—	—
SO	—	0.0453*** (0.0079)	—
GO	—	—	0.0011** (0.0005)
BSZ	−0.0007 (0.0008)	−0.0011 (0.0009)	−0.0489 (0.0549)
BIN	6.7413*** (0.3839)	7.0068*** (0.3202)	7.0328* (4.1614)
BFE	0.0299 (0.0748)	0.0148 (0.0644)	0.0447** (0.0221)
FOW	0.0594 (0.0846)	0.0679 (0.0712)	0.0871* (0.0522)
IOW	0.2812 (0.3827)	0.3896 (0.3188)	0.4179 (0.2635)
SIZ	0.0735*** (0.0261)	0.0809*** (0.0221)	0.0904 (0.0754)
LEV	−0.1522 (0.096)	−0.1379 (0.0844)	−0.0819*** (0.0194)
AGE	0.0023** (0.0010)	0.0028*** (0.0008)	0.0023*** (0.0007)
ROA	0.2102 (0.2564)	0.4174** (0.2075)	0.4547** (0.1856)
Year dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
R ²	0.3019	0.3115	0.3826
F-statistics	40.52	60.44	63.13
Prob > F	0.000	0.000	0.000

*, ** and *** show significance level at 10%, 5% and 1%, respectively.

Refer to Table 1 for variable definitions.

Numbers in parentheses are standard errors robust to heteroscedasticity.

5. Conclusion

Prior empirical studies have focused on the influence of ESG performance on several organisational outcomes, ignoring corporate resilience. Corporate resilience is important because firms are bound to experience shocks due to evolving market conditions and changes in environmental demands. Hence, this research examined the effect of ESG performance on the resilience of 128 non-financial listed companies in Saudi Arabia. The analysis spanned the period from 2014 to 2023, utilising various specifications and frameworks. The results indicate that stronger ESG performance can make firms more resilient and imply that prioritising ESG initiatives can improve corporate image and enhance competitive advantage for stable operations, thereby fostering resilience.

The findings align with legitimacy, stakeholder, and agency theories, which suggest that strong governance, ESG commitment, and stakeholder engagement are crucial factors for corporate survival and sustainability. This implies that the suggestions of these theories can yield positive outcomes on the sustainability and resilience of Saudi firms. This finding is expected to encourage managers to value ESG initiatives more to sustain their organisations. This evidence aligns with the Sustainable Development Goals (particularly SDG-17) and provides additional insights for enhancing environmental, social, and governance performance, thereby achieving firms' long-term success and resilience. These findings can shape future ESG initiatives when updating or developing new standards to enhance accountability and meet stakeholders' needs. In particular, the research outcome has a policy impact on the Saudi Vi-

sion 2030 plan. The finding implies that ESG initiatives can facilitate consistent growth through renewable energy and carbon-emission reduction efforts. This positive development can enhance governance and attract investments, building a resilient economy consistent with the Vision 2030 agenda.

This study provides valuable insights into sustainability and firm behaviours. However, several limitations should be acknowledged, which also provide directions for future research in this context. Future research can utilise other measurement proxies of corporate resilience for comparison with our findings. The present empirical work is on Saudi market, limiting the generalisability of the findings to other emerging markets due to distinct regulations. Hence, future studies can expand our scope for additional insights from other markets. Our analysis can be expanded by incorporating variables not included in our panel to gain additional insights into the determinants of corporate resilience. Future studies can conduct sectoral analysis to capture industry trends and provide further insights in this context. Mediation or moderation can be undertaken to shed light on the mechanisms underlying the relationship between ESG performance and resilience.

Availability of Data and Materials

The research data can be provided by the corresponding author on request.

Author Contributions

Author HGHS prepared the conceptualization, writing-original draft, formal analysis, and project management. Authors AAA, FAA, and YAA were involved in writing – review & editing, investigation, and software. All authors contributed to data curation, methodology, visualization, and critical revision of the manuscript for important intellectual content. All authors read and approved the final manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

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Conflicts of Interest

The authors declare no conflicts of interest.

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