

**The Impact of Internal Governance Mechanisms on Environmental Performance
of Saudi Firms**

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Declarations

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Abstract

Purpose- We argue that firms that have a sustainability committee operating on the board, publish separate sustainability reports that are externally assured by an independent external audit, and have large and active boards are more likely to be engaged in environmental practices and have better environmental performance.

Design/methodology/approach- Based on a sample of firms listed on the Saudi Stock Exchange, covering the period 2014–2021, we apply panel data models to examine the research hypotheses.

Findings- Our findings show significant positive associations between the existence of sustainability committee, the publication of a separate sustainability reports, and the independent external assurance of these reports and environmental performance. We also find that the composite internal governance index is significant and positively associated with environmental performance.

Practical implications- Policy makers should support the creation of sustainability committee on the boards of Saudi firms and review its role and responsibilities. Our findings inform regulators of the importance of the existence of independent external assurance of sustainability reports of Saudi firms to enhance the credibility and reliability of these reports. Managers need to establish devoted committees committed to sustainability related tasks that help coordinate communications between the firm and stakeholders.

Originality/value- The Saudi Arabia government has implemented a range of policies and initiatives aim to improve environmental performance which is a main focus of Saudi Vision 2030 to achieve environmental sustainability. Therefore, we provide a unique evidence and new insights on impact of internal governance on corporate environmental performance in the Saudi context.

Keywords: Internal governance; environmental performance; sustainability committee; sustainability reports; external assurance

1. Introduction

Corporate environmental responsibility (CER) is an increasingly important issue for companies across the world, as businesses are under increasing pressure from governments, consumers, and investors to reduce their environmental damage (Li et al., 2020; Al-Shaer et al., 2022; Albitar et al., 2023). The Kingdom of Saudi Arabia, as one of the world's leading oil-producing countries, has a crucial role to play in promoting environmental sustainability (Singh et al., 2022). As a country that has a rapidly growing economy, driven largely by its oil and gas industry, Saudi Arabia has a significant impact on the global environment, both in terms of carbon emissions and the use of natural resources (Khan et al., 2023).

In recent years, the Saudi government has recognized the need to promote environmental performance and has implemented a range of policies and regulations aimed at reducing the country's environmental impact and enhance corporate environmental performance (Ammer et al., 2020). Saudi Arabia has joined over 100 other nations in committing to achieving net-zero emissions, which will help to reduce global warming. In order to achieve this goal, Crown Prince Mohammed Bin Salman has announced that the Gulf State will invest more than 700 billion Saudi Riyals (\$186.66 billion) by 2060 to bring their carbon emissions to net-zero. Furthermore, Saudi companies will be required to engage in advanced development programs to further reduce their emissions. Saudi Arabia's 2030 vision places sustainability at its core, and with this new endeavour, the country is ushering in a new era by aiming to achieve net-zero carbon emissions by 2060. One of the main focus of Saudi Vision 2030 is to achieve environmental sustainability, which is essential for the well-being of future generations and the quality of people's lives (Ammer et al., 2020).

Corporate governance plays a crucial role in a firm's success, with strong links to greater investor trust and improved environmental performance (Al-Shaer et al., 2022). The

composition of a firm's board, including factors such as board size, independence, and diversity, is essential in promoting sustainable practices and ensuring that the firm's operations align with the interests of its stakeholders (Peters and Romi, 2015; Liao et al., 2015; Al-Shaer and Zaman, 2019; Karim et al., 2022; Hussainey et al., 2022; Ananzeh et al., 2022). However, while prior research has identified board composition as a critical factor, it alone does not fully capture a board's commitment to environmental issues and environmental performance (Bui et al., 2020; Albitar et al., 2022; Albitar et al., 2023). For instance, Jain and Zaman (2020) argue that environmental practices may be impacted differently by specific board characteristics. Previous studies such as (Bui et al., 2020; Albitar et al., 2023) have emphasized the necessity to shift from general corporate governance practices towards environmental governance to effectively measure and improve corporate environmental performance. Therefore, internal governance includes other proxies such as sustainability committees, sustainability reporting, and sustainability assurance that are also critical components and have direct impact on corporate environmental performance (Albitar et al., 2022).

Theoretically, based on the agency theory, it is important to monitor and control the behaviour of managers to ensure that they prioritize the maximization of shareholder wealth over their own interests, which may not align with those of the shareholders (Fama & Jensen, 1983). The composition of boards of directors such as (board size, independence and gender diversity) are crucial governance mechanisms for firms. Internal governance can be used to align the interests of owners and managers and balance the costs and benefits of adopting effective environmental strategies (Halme & Huse, 1997). For example, prior research suggests that a large board of directors is more likely to support internal corporate engagement in environmental practices because it is expected to include more independent and experienced members who can monitor managers' activities and enhance activities and practices regarding

environmental matters (Giannarakis et al., 2020; Gerged, 2021). In addition to that, based on the view of resource dependence theory (RDT), firms require external resources to survive and succeed (Shaukat et al., 2016). Internal sustainability governance mechanisms, such as board-level sustainability committees and sustainability assurance, are considered capital resources that can improve a company's sustainability and environmental practices (Al-Shaer, 2020; Albitar et al., 2023). For example, sustainability committees serve as an internal resource that helps supervise sustainability activities and enhance environmental performance (Peters & Romi, 2015; Al-Shaer, 2020).

The objective of this study is to offer empirical evidence on the significance of internal governance in enhancing the environmental performance of firms in Saudi Arabia. As there is a growing demand for improved sustainability practices, strong internal governance is expected to influence firm strategies and operations related to environmental performance. Therefore, in this study, we aim to answer a main research question which is: What is the impact of internal governance mechanisms on corporate environmental performance in Saudi Arabia? To answer this question, we propose the following sub-questions: what are the internal governance factors that trigger environmental performance and sustainability practices within Saudi firms? Whether corporate size and profitability play a role on the internal governance-environmental performance nexus?

Our study contributes to prior literature on corporate environmental performance literature in several ways. First, we contribute to the debate on the role of internal governance factors in improving corporate environmental performance. Prior literature either focuses on board composition and CSR (Rao et al., 2016; Ebaid, 2022) or the impact on firm value (Ammer et al., 2020). For example, Ebaid (2022) uses board independence, board size and gender diversity as proxies for corporate governance when examining the effects of corporate governance on CSR based on a sample from companies listed on the Saudi stock exchange, whereas we take

this further by considering other crucial internal factors (sustainability committee, sustainability reporting and assurance) that can trigger environmental performance. Second, to the best of our knowledge, this paper is the first in this domain to examine the effect of internal governance on corporate environmental performance in the Saudi context. As shown, prior studies focused on corporate social responsibility (CSR) and ESG (Abdalkrim, 2019; Harun et al., 2020; Ebaid, 2022). The Saudi Arabia government has implemented a range of policies and regulations aimed at promoting environmental sustainability, including the National Environmental Strategy (NES) and the National Transformation Program (NTP). These initiatives aim to reduce the country's carbon footprint, promote sustainable resource use, and improve environmental performance which is a main focus of Saudi Vision 2030 to achieve environmental sustainability. Therefore, we provide a unique evidence and new insights on impact of internal governance on corporate environmental performance.

The remainder of the paper is organised in the following manner: Section 2 outlines literature review and hypotheses development. Section 3 describes the research method, which encompasses data and sample selection, variable measurement, and model specifications. Section 4 presents the results. Finally, Section 5 offers concluding remarks on the research.

2. Literature review and hypothesis development

In recent years, the issue of corporate environmental responsibility (CER) has garnered significant public attention, leading to a surge in research on CER-related topics such as environmental performance, carbon emissions, and climate change (Al-Shaer and Zaman, 2018; Li et al., 2020; Karim et al., 2022). As a result, companies with strong reputations and high visibility among customers and investors are increasingly aware of the potential negative impacts of environmental issues (Qureshi et al., 2020). To demonstrate their accountability and transparency to stakeholders, sustainability reports have emerged as a crucial tool for companies (Hollindale et al., 2019; Al-Shaer et al., 2021). In this study, we include a measure

of internal governance that contains seven components. Most of the previous research consider board size, board independence, gender diversity and board meetings as key internal governance mechanisms (Gerged et al., 2021; Karim et al., 2022; Shohaieb et al., 2022; Hussainey et al., 2022; Ananzeh et al., 2022). Larger board is generally associated with better governance, as it can help to mitigate agency conflicts and enhance corporate environmental practices (Gerged et al., 2021). Independent directors play a critical role in monitoring corporate activities to safeguard shareholders' wealth while also promoting greater environmental practices that result in improved environmental performance (Gerged et al., 2021). Husted and Sousa-Filho (2018) have found empirical support for a positive correlation between the proportion of women on a company's board and the effectiveness of its corporate governance. Women tend to focus on social issues and bring new skills to boardrooms. As a result, they are more likely to provide suggestions that would enhance the legitimacy of a company's activities (Lu and Herremans, 2019; Al-Shaer et al., 2021). Furthermore, Gulzar et al. (2019) provide evidence that greater gender diversity on boards would strengthen the concept of social responsibility. A significant body of literature indicates that the frequency of board meetings has a favorable effect on sustainability practices (Gerged et al., 2021). The frequency of board meetings is associated with more effective oversight of managerial opportunistic behaviour, which can result in better environmental practices.

Companies that establish a separate CSR committee to oversee sustainability-related activities are regarded as contributing to internal governance. Such committees can help raise awareness about environmental issues and improve the quality and reliability of sustainability reports (Al-Shaer, 2020). Research by Liao et al. (2015) and Peters and Romi (2015) has explored the impact of sustainability committees on sustainability disclosure and has found a positive correlation between the two. Consequently, addressing sustainability issues at the board level by establishing a sustainability committee is associated with

improved environmental performance. An essential method utilized by companies to communicate their economic, social, and environmental impact is to publish a separate sustainability report (Romero et al., 2019). According to Mahoney (2012), companies that publish sustainability reports have higher social and environmental ratings compared to those that do not. Additionally, Romero et al. (2019) found that companies that publish sustainability reports provide higher quality information than companies that include their sustainability information in their annual reports. Based on this, companies that publish a stand-alone sustainability report are expected to prioritize aligning their goals and actions with environmental values, resulting in improved environmental performance.

Prior research has concluded that companies can strengthen the content and credibility of sustainability reports through external assurance (Clarkson et al., 2019; Al-Shaer, 2020; Albitar et al., 2021). Therefore, external assurance of sustainability reports can improve a company's transparency and enhance its environmental activities.

Therefore, in this study, we use an index to measure the quality of the internal corporate governance system dimensions (e.g., board size, board independence, board meetings, audit committee independent, sustainability committee, sustainability reporting, and sustainability assurance). A higher score of this composite index indicates a better internal governance and vice versa. Therefore, we postulate the following hypothesis:

Hypothesis: There is a positive relationship between internal governance mechanisms and environmental performance of Saudi firms.

3. RESEARCH METHOD

3.1. Empirical Model

We construct the OLS regression model below to examine the impact of internal governance mechanism on environmental performance. The variables used in this study are defined in Appendix. All regressions include year and industry fixed effects where industry dummies are created based on the SIC one-digit industry classification.

$$ENV_{score} = \beta_0 + \beta_1 SUSCOM + \beta_2 SUS_{reporting} + \beta_3 EXT_{assurance} + \beta_4 ACIND + \beta_5 BODSIZE + \beta_6 BODIND + \beta_7 BODMEET + \beta_8 SIZE + \beta_9 ROA + \beta_{10} LEV + \beta_{11} Industry\ dummies + \beta_{12} Year\ dummies + \epsilon \quad [1]$$

In Model 2, we replace the individual internal governance characteristics with the composite index (*INCG_index*):

$$ENV_{score} = \beta_0 + \beta_1 INCG_index + \beta_8 SIZE + \beta_9 ROA + \beta_{10} LEV + \beta_{11} Industry\ dummies + \beta_{12} Year\ dummies + \epsilon \quad [2]$$

3.2. Data and variables

Our dependent variable is environmental performance. We use environmental pillars collected from the Thomson Reuters ASSET 4 database as a proxy for environmental performance (e.g., Duque-Grisales and Aguilera-Caracuel, 2019; Eccles et al., 2014; Ioannou & Serafeim, 2012). Independent variables are the internal corporate governance variables. Prior literature shows a link between internal governance mechanism and environmental performance (Al-Shaer et al., 2017; Al-Shaer and Zaman, 2018; Ioannou and Serafeim, 2012; Ullah et al., 2019). We include the existence of board-level CSR committee (*SUSCOM*), measured using a dummy variable equals 1 if a committee exists and zero otherwise, whether a company publishes sustainability reports (*SUS_reporting*), measured using a dummy variable equals 1 if a sustainability report is available and zero otherwise, the tendency of sustainability reporting assurance (*EXT_assurance*) measured using a dummy variable equals to 1 if sustainability reports are externally assured and 0 otherwise, proportion of audit committee members who are independent directors (*ACIND*), board size (*BODSIZE*)

measured by total number of directors serving on the board, board independence (BODIND) measured by the proportion of independent directors to the total number of directors on the board, and board activity using the total number of board meetings held during the year (BODMEET). We finally control for firm-specific characteristics. We include firm size (SIZE) measured by the natural log of total assets, profitability of the firm measured by return on asset (ROA), leverage (LEV) measured by total debt to total asset ratio, and industry and year dummies.

3.3. Sample Selection

Table I shows a sample distribution. We use the Thomson One Banker to obtain a sample of firms listed on the Saudi Stock Exchange, covering the period 2014–2021, and collect our variables from the Eikon database. We lose observations due to missing data for some corporate governance and financial variables. Our final unbalanced sample consists of 189 firm-year observations based in Saudi Arabia. The sample was chosen from 10 different industries: telecommunication, health care, financials, real estate, consumer discretionary, consumer staples, industrials, basic materials, energy, and utilities.

[Table I about here]

3.4. Descriptive statistics

Table II presents descriptive statistics of environmental performance variables, corporate governance variables and control variables for all companies in the sample. We find the mean value of the environmental score to be 17.894 and the mean value of *ESG_score* is 31.387. We find that, on average, 32.3 % of our sample firms have sustainability committees operating on board (*SUSCOM*), 33% of our sample firms publish sustainability reports (*SUS_reporting*), and only 6% of our sample firms get their sustainability reporting externally assured by an independent external audit (*EXT_assurance*). We find that the mean for audit committee

independence (ACIND) is 65%, the mean board size (BODSIZE) is 9.958 and board independence (BODIND) is 0.424 which means that less than half of the board members are independent. The mean number of board meetings is 6.093. Regarding firm-specific control variables, we find the mean firm size (SIZE) is 24.378 measured using the natural log of total assets, return on assets (ROA) is 0.049 and leverage (LEV) is 0.593.

[Table II about here]

Table III shows the correlation matrix for variables used in our analysis. We find that ENV_score has a significant and positive correlation with SUS_reporting, EXT_assurance, and SIZE, and significant and negative correlation with BODIND. We do not find any correlation above 0.5 among the variables which suggests multicollinearity is not an issue. No correlation coefficient between two explanatory variables exceeds 0.8. As a result, there is no evidence of serious multicollinearity. The variance inflation factor (VIF) values range from 1.08 to 1.55 with a mean value of 1.26.

[Table 3 about here]

4. EMPIRICAL RESULTS AND DISCUSSIONS

4.1. Baseline Regression Results

Table IV presents the results of the impact of internal corporate governance variables on environmental performance, measured by ENV_score using OLS estimator as a baseline model. Column 1 includes the individual characteristics on internal corporate governance system and column 2 replaces the individual components with the index that measures the quality of internal corporate governance system (INCG_index). The results show that SUSCOM is positive and significant at 1% level with ENV_score indicating that environmental performance improves with the existence of sustainability committee on the board.

SUS_reporting is positive and significant at 1% level with *ENV_score* indicating that firms that publish sustainability report are more likely to be associated with better environmental performance. *EXT_assurance* is also positive and significant at 10% level with *ENV_score* suggesting that the voluntary adoption of independent external assurance is likely to improve environmental performance. Among corporate board variables, we find that *BODIND* is negative and significant at 1% level with *ENV_score* suggesting that higher proportion of independent directors on the board of Saudi firms is more likely to enhance monitoring and focusing on maximising shareholders' wealth at the expense of long-term environmental activities.

In column 2, we replace the individual characteristics of internal corporate governance with *INCG_index*. The Result shows that *INCG_index* is positive and significant at 1% level with *ENV_score* suggesting that the existence of effective internal governance system is likely to enhance corporate engagement in environmental activities and improve environmental performance. Among the control variables, we find that *SIZE* is positive and significant at 1% level and *LEV* is negative and significant at 5% level with *ENV_score* respectively, indicating that larger firms with lesser financial obligations are more likely to engage in environmental practices that improve environmental performance.

The results confirm our hypothesis on the role of internal governance mechanisms in enhancing corporate environmental performance and are consistent previous literature that argues that sustainability committees help in engaging in dialogue with stakeholders and advise the board to adopt various environmental strategies (Al-Shaer et al., 2021; Peters et al., 2019). Companies that develop a productive collaboration with stakeholders are more likely to publish sustainability reports to inform stakeholders about different sustainability initiatives that a company is developing (Al-Shaer et al., 2021). The independent external assurance helps reduce stakeholders' concerns regarding the credibility and usefulness of

environmental information reported in firms' sustainability reports and reduce legitimacy pressure (Al-Shaer and Zaman, 2018; Peters and Romi, 2015).

[Table IV about here]

4.2. Additional analysis

In order to check whether our results are driven by the size factor, we divide the sample into small-sized firms and big-sized firms based on the median and report the result in Table V. This approach will allow us to investigate the impact of internal governance mechanisms beyond any size effect. Our result for the sample of large firm are qualitatively similar to the baseline regression analysis and shows that SUSCOM is positive and significant at 5% level with *ENV_score*, *SUS_reporting* is positive and significant at 1% level with *ENV_score*, and BODIND is negative and significant at 1% level with *ENV_score*. *INCG_index* is also positive and significant at 1% level with *ENV_score*. Our results for the sample of small firms are less significant for our variables of interest, and only *SUS_reporting* shows to be positive and significant at 5% level. The composite index (*INCG_index*) do not show to be significant. Small firms may perceive that the incremental cost of engaging in long-term environmental strategies outweighs the benefits, and such costs are difficult to overcome.

[Table 5 about here]

In Table VI, we divide the sample into loss-making firms and non-loss-making firms.¹ The result shows that SUSCOM is positive and significant at 5% level with *ENV_score*, *SUS_reporting* is positive and significant at 1% level with *ENV_score* the subsample of firms that are making losses during the period of the study. However, the result is more statistically significant for the subsample of firms that are making profit and it shows that SUSCOM and

¹ Loss-making firms are the firms the report negative net income at the end of fiscal year.

SUS_reporting are both significant at 1% level with *ENV_score*, *EXT_assurance* is positive and significant at 10% level with *ENV_score*, and *BODIND* is negative and significant at 1% level with *ENV_score*. *INCG_index* is positive and significant at 5% level with *ENV_score* in both subsamples.

[Table VI about here]

In Table VII, we explore industry influence on the impact of internal governance mechanisms on environmental performance by dividing the sample in into firms operating in the financial sector and firms operating in the non-financial sector since financial firms make up a large proportion of our sample. Firms in the financial industry exhibit distinct corporate governance and financial characteristics (Al-Shaer and Zaman, 2016). Our result for the sample of non-financial firms are qualitatively similar to the baseline regression analysis and shows that *SUSCOM* is positive and significant at 5% level with *ENV_score*, *SUS_reporting* is positive and significant at 5% level with *ENV_score*, *EXT_assurance* is positive and significant at 10% level with *ENV_score*, *BODIND* is negative and significant at 1% level with *ENV_score*, and the composite index (*INCG_index*) is positive and significant at 1% level with *ENV_score*. However, the result is less statistically significant for financial firms and shows that *SUS_reporting* is significant at 1% level with *ENV_score* and *BODIND* is negative and significant at 10% level with *ENV_score*. *INCG_index* is positive and significant at 5% level with *ENV_score*. The results indicate the financial firms are less likely to engage in environmental activities possibly due to the fact that their activities have lower impact on the environment.

[Table VII about here]

In Table VIII, we replace *ENV_score* with total social, environmental, and governance score (*ESG_score*) collected from the Thomson Reuters ASSET 4 database. The results show that

SUSCOM and *SUS_reporting* are both positive and significant at 1% level with *ENV_score* , *EXT_assurance* is positive and significant at 10% level with *ENV_score*, ACIND positive and significant at 1% level with *ENV_score*, BODIND is negative and significant at 1% level with *ENV_score*, and *INCG_index* is positive and significant at 1% level with *ENV_score*. Overall, the results in Table 8 remain qualitatively similar and provide evidence of internal governance mechanisms having an impact on ESG performance.

[Table VIII about here]

5. SUMMARY AND CONCLUSION

We examine the impact of internal governance mechanisms on environmental performance of Saudi firms. We argue that firms that have a sustainability committee operating on the board, publish separate sustainability reports that are externally assured by an independent external audit, and have large and active boards are more likely to be engaged in environmental practices and have better environmental performance. We find a significant positive association between the existence of sustainability committee on the board of Saudi firms, the publication of a separate sustainability reports, and the independent external assurance of these reports and environmental performance. We also find that a higher proportion of independent directors on the board of Saudi firms is significant and negatively associated with environmental performance suggesting that independent directors are more likely to enhance monitoring and focusing on maximizing shareholders' wealth at the expense of long-term environmental strategies. Finally, we find that the composite internal governance index is significant and positively associated with environmental performance. We run additional analyses and the results hold.

The study's findings have important implications for policy makers and firm managers. For policy makers. The study findings highlight the importance of a sustainability

committee. As such, policy makers should support the creation of sustainability committee on the boards of Saudi firms and review its role and responsibilities. Our findings may help to inform regulators of the importance of the existence of independent external assurance of sustainability reports of Saudi firms to enhance the credibility and reliability of these reports. For managers, our findings suggest that corporate managers need to establish devoted committees committed to sustainability related tasks that help coordinate communications between the firm and stakeholders. They also need to understand the importance of the sustainability assurance process on enhancing the credibility of environmental information that reflect the real corporate engagement in environmental practices.

Our paper has a few limitations that provide opportunities for future research. The findings are restricted to Saudi companies. Further research may examine the impact of internal governance mechanisms on environmental performance in other institutional contexts in which the internal governance system is different. Future research could explore changes in the adoption of sustainability reporting assurance and the establishment of sustainability committees in the Saudi institutional context using a larger, longitudinal dataset. Finally, future research could investigate the impact of internal governance mechanisms on specific dimensions of environmental performance such as carbon performance and firms' commitment to other climate change issues.

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Appendix: Variable Definition

ENV_score	Represents the overall company score based on the reported information in the environmental pillars from Aseet4 database.
ESG_score	Represents the overall company score based on the reported information in the environmental, social, governance pillars from Aseet4 database.
SUSCOM	An indicator variable takes a value of 1 If a board-level sustainability committee exists, otherwise 0
SUS_reporting	An indicator variable takes a value of 1 If the firm publishes sustainability reports, otherwise 0
EXT_assurance	An indicator variable takes a value of 1 if sustainability report is externally assured, 0 otherwise.
ACIND	Proportion of audit committee members who are independent
BODSIZE	Number of directors on the board
BODIND	Proportion of independent directors on the board
BODMEET	Number of board meetings held during the year
INCG_index	Index that measures the quality of the internal corporate governance system for Saudi firms computed by totalling the proxies of seven internal governance characteristics: BODSIZE: Dummy variable if the number of board members is higher than the industry median, 1; otherwise, 0 BODIND: Dummy variable if the percentage of independent directors on the board is higher than the industry median, 1; otherwise, 0 BODMEET: Dummy variable if the number of board meetings is higher than the industry median, 1; otherwise, 0 ACIND: Dummy variable if the percentage of independent audit committee directors is higher than the industry median, 1; otherwise, 0 SUSCOM: An indicator variable takes a value of 1 If a board-level sustainability committee exists, otherwise 0 SUS_reporting: An indicator variable takes a value of 1 If the firm publishes sustainability reports, otherwise 0 EXT_assurance: An indicator variable takes a value of 1 if sustainability report is externally assured, 0 otherwise.
SIZE	Natural log of total assets
ROA	Return on assets measured by net income to total assets
LEV	Ratio of debt to total asset

Table I- Sample Distribution

	Frequency	Percent
Distribution by Year		
2014	6	3.17
2015	14	7.41
2016	14	7.41
2017	16	8.47
2018	34	17.99
2019	36	19.05
2020	42	22.22
2021	27	14.29
Total	189	100.01
Distribution by Industry		
Telecommunications	18	9.52
Health Care	5	2.65
Financials	68	35.98
Real Estate	10	5.29
Consumer Discretionary	4	2.12
Consumer Staples	14	7.41
Industrial	12	6.35
Basic Material	45	23.81
Energy	5	2.65
Utilities	8	4.23
Total	189	100%

Variables are as defined in Appendix.

Table II- Descriptive Statistics

Variable	No	Mean	SD	P25	P50	P75	Min	Max
ENV_score	189	17.849	23.328	0.000	3.907	30.145	0.000	84.786
ESG_score	189	31.387	18.422	15.313	31.309	45.777	0.723	71.986
SUSCOM	189	0.323	0.469	0.000	0.000	1.000	0.000	1.000
SUS_reporting	189	0.328	0.471	0.000	0.000	1.000	0.000	1.000
EXT_assurance	189	0.063	0.244	0.000	0.000	0.000	0.000	1.000
ACIND	188	0.649	0.265	0.500	0.667	0.100	0.000	0.100
BODSIZE	189	9.958	2.719	9.000	10.000	11.000	1.000	25.000
BODIND	189	0.424	0.127	0.333	0.417	0.500	0.091	0.800
BODMEET	129	6.093	2.134	5.000	6.000	7.000	2.000	15.000
SIZE	189	24.378	1.756	23.025	24.238	25.871	20.030	28.401
ROA	189	0.049	0.076	0.010	0.021	0.080	-0.139	0.379
LEV	189	0.593	0.650	0.087	0.328	0.975	0.000	3.904

Variables winsorised to adjust for outliers. Variables are as defined in Appendix.

Table III- Correlation Matrix

Variable	1	2	3	4	5	6	7	8	9	10	11
ENV_score	1										
SUSCOM	0.5406*	1									
SUS_reporting	0.4059*	0.5782*	1								
EXT_assurance	0.3082*	0.3772*	0.3727*	1							
ACIND	-0.0632	0.0486	0.0034	-0.0156	1						
BODSIZE	0.0279	0.0358	-0.0182	-0.0119	-0.1271	1					
BODIND	-0.3109*	0.0481	-0.0878	-0.2566*	0.2205*	0.0734	1				
BODMEET	0.0909	-0.0174	0.07	-0.0466	0.056	0.0324	-0.0659	1			
SIZE	0.3545*	0.2753*	0.3481*	0.2050*	-0.0146	0.0748	-0.1749*	0.2816*	1		
ROA	0.1282	0.0424	0.0442	-0.0215	0.0932	-0.0723	-0.007	-0.2397*	-0.1705*	1	
LEV	0.0718	0.1546*	0.1576*	0.1388	-0.1111	-0.1337	-0.0199	0.0544	0.0717	-0.2979*	1

This table reports the Pearson correlation matrix between the variables used in the analyses, where coefficients in bold indicate significance at the 5% level or better. Variables are as defined in Appendix.

Table IV- The impact of internal governance factors on environmental performance

Variable	ENV_score	ENV_score
SUSCOM	9.4832*** [2.71]	
SUS_reporting	12.5090*** [3.74]	
EXT_assurance	11.2578* [1.74]	
ACIND	0.0277 [0.49]	
BODSIZE	0.3388 [0.59]	
BODIND	-46.6823*** [-3.78]	
BODMEET	-0.242 [-0.30]	
INCG_index		3.9006*** [3.04]
SIZE	3.6451*** [3.22]	3.4013*** [2.75]
ROA	16.0921 [0.61]	-51.6357 [-1.85]
LEV	-0.5523 [-0.23]	-5.8269** [-1.99]
Industry fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
Intercept	-61.5800* [-1.69]	-44.3945 [2.29]
R-squared	0.6611	0.5072
N	189	189

* p<0.1, ** p<0.05, *** p<0.01. Variables are as defined in Appendix.

Table V- Size effects

Variable	Big-sized Firms		Small-sized Firms	
	ENV_score	ENV_score	ENV_score	ENV_score
SUSCOM	10.7372** [2.61]		4.0786 [0.35]	
SUS_reporting	12.1750*** [3.16]		20.7298** [2.49]	
EXT_assurance	10.1032 [1.23]		1.802 [0.04]	
ACIND	0.0087 [0.12]		0.0138 [0.10]	
BODSIZE	0.7589 [1.15]		1.0622 [0.49]	
BODIND	-61.9746*** [-4.06]		6.4966 [0.27]	
BODMEET	-0.5194 [-0.50]		0.1933 [0.16]	
INCG_index		4.8128*** [2.78]		1.0069 [0.64]
ROA	-8.3036 [-0.19]	-47.6749 [-1.08]	36.8525 [1.07]	-26.1367 [-1.00]
LEV	-2.3747 [-0.79]	-8.9454** [-2.35]	9.1143 [1.77]	1.1287 [0.26]
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Intercept	78.5691*** [3.45]	13.6221 [0.75]	-12.4698 [-0.45]	55.0727*** [3.05]
R-squared	0.6624	0.4768	0.8615	0.7968
N	142	142	47	47

* p<0.1, ** p<0.05, *** p<0.01. Variables are as defined in Appendix.

Table VI- Loss-making firm vs. non-loss-making firms

	Loss-making firms		Profitable firms	
	ENV_score	ENV_score	ENV_score	ENV_score
SUSCOM	9.2846** [3.45]		13.9316*** [3.68]	
SUS_reporting	14.0186*** [4.94]		16.0223*** [4.33]	
EXT_assurance	21.2930 [1.51]		12.0575* [2.38]	
ACIND	0.1065 [1.20]		-0.0143 [-0.24]	
BODSIZE	-0.1594 [-0.42]		0.6708 [1.04]	
BODIND	-2.0095 [-0.16]		-51.6722*** [-3.82]	
BODMEET	-0.1166 [-0.28]		0.3382 [0.41]	
INCG_index		6.1805* [2.21]		5.1541** [3.28]
SIZE	1.0858 [0.74]	1.3903 [0.43]	0.3298 [0.36]	3.2883*** [3.21]
LEV	4.875 [1.18]	6.4066 [1.08]	1.86 [0.82]	1.851 [0.66]
Industry fixed effect	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Intercept	-33.6884 [-0.86]	-45.6323 [-0.63]	12.6315 [0.56]	-76.5968*** [-3.17]
R-squared	0.9857	0.4608	0.5172	0.2078
N	24	24	164	164

* p<0.1, ** p<0.05, *** p<0.01. Variables are as defined in Appendix.

Table VII- Industry effect

Variable	Firms operating in the non-financial sector		Firms operating in the financial sector	
	ENV_score	ENV_score	ENV_score	ENV_score
SUSCOM	12.2830** [2.45]		5.2692 [1.24]	
SUS_reporting	13.2320** [2.35]		14.3923*** [3.40]	
EXT_assurance	9.0872* [2.20]		0.023 [0.01]	
ACIND	-0.0555 [-0.72]		0.0933 [1.21]	
BODSIZE	-0.7856 [-1.07]		0.5865 [0.63]	
BODIND	-49.8517*** [-2.97]		-31.1210* [-1.90]	
BODMEET	-0.1488 [-0.17]		-0.5667 [-0.53]	
INCG_index		3.0258*** [3.70]		5.2287** [2.77]
SIZE	3.3654** [2.56]	6.5250*** [5.11]	2.6431** [2.11]	3.4513*** [3.35]
ROA	3.649 [0.13]	4.4564 [0.15]	-61.9083 [-0.83]	-107.8854* [-1.97]
LEV	-2.7677 [-0.80]	-1.9326 [-0.50]	-0.806 [-0.26]	-1.5321 [-0.47]
Year fixed effect	Yes	Yes	Yes	Yes
Intercept	-30.1029 [-0.76]	-166.4149*** [-5.32]	-50.1236 [-1.31]	-96.9985*** [-3.73]
R-squared	0.705	0.4452	0.5658	0.616
N	111	111	78	78

* p<0.1, ** p<0.05, *** p<0.01. Variables are as defined in Appendix.

Table VIII- Replicating the baseline results using total ESG score

Variable	ESG_score	ESG_score
SUSCOM	8.4902*** [3.04]	
SUS_reporting	12.9671*** [4.87]	
EXT_assurance	10.8004* [1.86]	
ACIND	0.1483*** [3.32]	
BODSIZE	-0.7037 [-1.53]	
BODIND	-29.8247*** [-3.03]	
BODMEET	0.1098 [0.17]	
INCG_index		4.7754*** [4.79]
SIZE	1.2873 [1.43]	2.6997*** [2.81]
ROA	-10.9276 [-0.52]	-8.8352 [-0.41]
LEV	-1.3739 [-0.72]	0.6009 [0.26]
Industry fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
Intercept	29.5091 [1.01]	-61.1433** [-2.43]
R-squared	0.6531	0.5832
N	189	189

* p<0.1, ** p<0.05, *** p<0.01. Variables are as defined in Appendix.