

The Impact of Corporate Governance on the Perceived Environmental Disclosure in the Firms Listed in the Saudi Exchange

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(Received: 10-05-2026; Accepted: 11-06-2026)

Abstract: In view of the literature review and based on the regulatory system in Saudi Arabia, the objective of the current research is to investigate the influence of corporate governance mechanisms on the perception of environmental disclosure among firms that operate in the Saudi Stock Exchange. The study utilizes a descriptive and analytical research methodology by designing a questionnaire and distributing it among CFOs, Corporate Governance Officers, and Internal Auditors. Initially, a total of 450 responses were collected. Following data screening, 87 responses were excluded due to straight-lining, yielding 363 usable responses. The study comes to a conclusion that corporate governance quality is fundamentally linked to the enhancement of environmental disclosure in the Saudi business context. It recommends the necessity of enhancing the boards' monitoring role in sustainability issues, maintaining members' independence, and integrating environmental disclosure objectives into the long-term strategic plans. This study provides three major contributions, one on a theoretical basis, another methodological, and finally an application point of view in terms of the contribution to policymakers and regulators. The study first develops a comprehensive framework by integrating the four theories in a Saudi Arabian ESG environment. Second, it utilizes the insiders' viewpoint in terms of methodology and not the archival analysis.

Keywords: Corporate Governance - environmental disclosure - Saudi Exchange - instrument stability - sustainability

أثر حوكمة الشركات على الإفصاح البيئي المُدرَك في الشركات المدرجة في البورصة السعودية

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(تاريخ الاستلام: 10-05-2026؛ تاريخ القبول: 11-06-2026)

مستخلص البحث: في ضوء ما تناولته الأدبيات السابقة، واستناداً إلى البيئة التنظيمية والتشريعية في المملكة العربية السعودية، تهدف هذه الدراسة إلى فحص أثر آليات حوكمة الشركات في تعزيز الإدراك المتعلق بالإفصاح البيئي لدى الشركات المدرجة في السوق المالية السعودية. ولتحقيق هذا الهدف، اعتمدت الدراسة المنهج الوصفي التحليلي، من خلال تطوير استبانة علمية وتوزيعها على عينة من المديرين الماليين، ومسؤولي حوكمة الشركات، والمراجعين الداخليين في الشركات المدرجة.

وقد بلغ عدد الاستجابات التي جمعت في المرحلة الأولية (450) استجابة. وبعد إجراء عمليات فحص البيانات والتحقق من جودتها، تم استبعاد (87) استجابة لعدم استيفائها معايير التحليل الإحصائي نتيجة اتباع نمط استجابة موحد (Straight-Lining)، ليصبح العدد النهائي للاستجابات الصالحة للتحليل (363) استجابة.

وأظهرت نتائج الدراسة وجود ارتباط جوهري بين جودة ممارسات حوكمة الشركات ومستوى الإفصاح البيئي في بيئة الأعمال السعودية، بما يؤكد الدور المحوري لآليات الحوكمة في تعزيز الشفافية والإفصاح عن القضايا البيئية. وبناءً على ذلك، توصي الدراسة بضرورة تعزيز الدور الرقابي لمجالس الإدارة تجاه قضايا الاستدامة، والمحافظة على استقلالية أعضاء المجلس، إضافة إلى دمج أهداف الإفصاح البيئي ضمن الخطط الاستراتيجية طويلة الأجل للشركات.

وتسهم هذه الدراسة في الأدبيات العلمية من خلال ثلاثة أبعاد رئيسية. فعلى المستوى النظري، تقدم إطاراً تكاملياً يربط بين أربع نظريات رئيسية لتفسير ممارسات الإفصاح البيئي في سياق معايير البيئة والمسؤولية الاجتماعية والحوكمة (ESG) في المملكة العربية السعودية. وعلى المستوى المنهجي، تتميز الدراسة بالاعتماد على تصورات الأطراف الداخلية ذات الصلة، ممثلة في المديرين الماليين ومسؤولي الحوكمة والمراجعين الداخليين، بدلاً من الاقتصار على البيانات الأرشيفية المستخدمة في معظم الدراسات السابقة. أما على المستوى التطبيقي، فتوفر نتائج الدراسة دلالات عملية وإرشادات مهمة لصناع السياسات والجهات التنظيمية والشركات المدرجة، بما يساهم في تطوير ممارسات الإفصاح البيئي وتعزيز فاعلية الحوكمة المؤسسية في المملكة العربية السعودية.

الكلمات مفتاحية: حوكمة الشركات - الإفصاح البيئي - البورصة السعودية - استقرار الأدوات المالية - الاستدامة.



DOI: 10.12816/0062620

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1. Introduction:

Since the world is witnessing a radical transformation towards sustainability, social and environmental criteria, and governance (ESG), environmental responsibility is no longer a secondary consideration; rather, it is a cornerstone for ensuring its continuity and legitimacy in the market. Thus, in Saudi Arabia, vision 2030 is a solid motive towards adopting sustainability practices. Capital Market Authority (CMA) has followed this trend by making necessary adjustments to the corporate governance rules in order to encourage transparency and disclosure. Environmental disclosure is among the most important forms of communications between the firm and its stakeholder, which is indicative of the firm's commitments towards environmental and social responsibilities.

Theory states that quality of corporate governance has an indispensable importance in terms of increasing the level of disclosure and transparency. Through governance structures, information flow between management and stakeholders is guaranteed and information asymmetry is prevented. Despite an ample number of empirical studies investigating the correlation between corporate governance and financial disclosure, it should be noted that more in-depth researches should be conducted to investigate the relation between governance mechanism and environmental disclosure, especially in emerging markets such as Saudi Stock Exchange.

In this research, I will try to fill a significant research gap related to professional perceptions of level of environmental disclosures and its correlation with detailed governance mechanisms, specifically the role of board environmental supervision and strategy integration. Research gap will be addressed through refocusing the attention from external disclosure practices to internal professional perceptions in the process of Vision 2030 implementation period. Previous studies on Saudi exchange focused on level of disclosure in the annual report (Al-Janadi et al., 2013; Habbash 2016), however, lack of empirical evidence in the "post 2021 era", when environmental disclosure was regulated through the Corporate Governance Regulations (CMS, 2023) has made it imperative to conduct an analysis of professional perception of environmental disclosure among insiders such as CFOs and governance officers in 2021-2024 period.

Unlike most previous research, the main emphasis of the study is on the insider perception (CFOs and governance officers) who is in possession of operational realities inside the firm.

This research will contribute to development of an integrated framework analysis, which aims at measuring the effect of five corporate governance dimensions on environmental disclosure using a measurement instrument with rigorous validation process conducted to confirm the psychometric properties of the instrument. Strict data quality screening measures will be used to make sure that data is of adequate quality and findings of this research will be reliable enough to benefit the stakeholders of the country.

1.1 Further specification of research gap:

Specifically, the research gap is fourfold. Firstly, previous Saudi studies predominantly used annual report content analysis approach, hence concentrating only on disclosed output of the governance process and not on internal governance processes behind disclosure (Al-Janadi et al., 2013; Habbash, 2016). Secondly, previous studies focused predominantly on voluntary disclosure or general corporate social responsibility disclosure without specifying environmental disclosure per se. Thirdly, a good part of previous evidence predates rapid regulatory developments associated with Vision 2030 and new Corporate Governance Regulations (Capital Market Authority [CMA], 2023). Hence, its ability to explain disclosure behaviour in post-2021 period is questionable. Finally, although previous studies from other emerging economies found a positive influence of board independence, board composition and committee design on environmental disclosure, it is still unclear whether the same relations hold for Saudi companies (Gerged, 2021; Nuskiya et al., 2021).

Therefore, this analysis addresses a combination of contextual, temporal, methodological and construct-related gaps. Specifically, the analysis attempts to uncover what kind of effects do pivotal corporate actors (CFOs, governance officers and internal auditors) perceive regarding the efficacy of key corporate governance dimensions in shaping environmental disclosure in Saudi listed firms. Such a perspective is justified because of frequent occurrence of environmental disclosure before its

actual publication, when it is discussed and shaped through board deliberation, board independence protections, committee meetings and strategic planning.

2. Theoretical Framework and Literature Review

2.1 Underpinning Theories

The study is grounded in three core theories to interpret the relationship between governance and environmental disclosure. First, Agency Theory, which assumes that governance operates as a mechanism to reduce the agency cost and the information asymmetry, thereby prompting managers to disclose environmental information in order to ensure investors (1976, Jense & Meckling). Second, Stakeholder Theory, which expands the responsibility scope to include nonfinancial parties, where environmental disclosure is a means to respond to the society expectations and regulatory entities. Third, Legitimacy Theory, which believes that firms disclose their environmental practices to maintain their 'social contract' and ensure social acceptance of their processes. (1995, Suchman) Fourthly, Resource Dependence Theory (Pfeffer & Salancik, 1978), where it is theorised that boards do not just act as monitors but are important suppliers of resources connecting firms to environmental players. Within the scope of environmental reporting, Resource Dependence Theory claims that a board that is diverse with its environmental expertise and stakeholder connections will be in a stronger position to access resources needed to make environmental reports. Altogether, the above-discussed theories shed light on how various facets of corporate governance affect environmental disclosure by Saudi-listed companies.

2.2 Corporate Governance and its Dimensions

Corporate Governance is defined as a set of rules, regulations, and procedures which ensure optimal protection and balance among managerial, shareholder, and other stakeholder interests. In the context of this study, five major dimensions were examined: (1) board environmental oversight, which means the extent of the board involvement in setting sustainability policies; (2) independency and Objective Oversight, which means the existence of independent members empowered to hold management accountable; (3) effectiveness

of specialized committees, such as audit, risk, and sustainability committees; (4) internal control and accountability, which include efficiency of internal control systems; and (5) strategic integration of stakeholders, which is the extent to which sustainability objectives are integrated into general corporate strategy.

2.3 Literature Review and Hypotheses Development

Numerous prior studies have confirmed a positive relationship between governance mechanism and environmental disclosure. This section confronts recent conceptual frameworks and empirical evidence from emerging markets. Theoretical perspectives on corporate governance have been enriched by recent contributions, for instance, Aguilera et al. (2021) builds on both agency and stakeholder theories, to develop an integrative framework that explains how governance structures promote business sustainability. Gerged (2021) shows that in emerging markets setting both board diversity and creation of environmental committees increase transparency. Thus, there is an empirical confirmation that board oversight goes further than mere financial concerns and includes environmental and social performance. The latter tendency is supported by new initiatives of the Saudi Capital Market Authority (2023), which implies changing focus of governance not from protecting shareholders but from balance of environmental and other stakeholders' interests. In this respect, Al-Janadi et al. (2013) state that board independence and size of the audit committee positively correlate with the quality of voluntary disclosure in Saudi Arabia. At the same time, Habbash (2016) argues that social responsibility practice of Saudi firms is heavily influenced by governance. Finally, Gerged (2021) concludes that in emerging markets setting board diversity and presence of environmental committees contribute to firms' transparency. Hence, the current paper puts forward the hypothesis about existence of significant positive correlation between corporate governance and level of environmental disclosure.

The above review highlights an existing problem of literature incoherence. Though many works prove existence of positive correlation between board independence, monitoring intensity and disclosure quality, there is less consensus regarding such issues as committees and internal controls. From

international perspective, emerging market evidence pays much attention to committee structure, audit expertise and sustainability assurance (Al-Shaer & Zaman, 2018; Gerged, 2021). Contrariwise, Saudi firms tend to focus on overall governance structure and ownership patterns instead of specific environmental disclosure process (Al-Janadi et al., 2013; Habbash, 2016). A more recent study by Aly et al. (2024), in which a comparison of corporate governance and environmental disclosures between countries was made, shows that the strength of the governance-disclosure link depends on the institutional environment – a result that highlights the necessity of conducting research focused specifically on Saudi Arabia as opposed to making unfounded generalizations based on Western or emerging markets. The results of Iatridis (2013), who showed that in the case of emerging market corporations, governance quality and disclosure quality are positively related and that disclosure quality is also value-relevant, thus provided initial evidence for the governance-disclosure relationship analyzed in this study. Giannarakis et al. (2020) extended the governance characteristics that drive environmental disclosure to include not only the traditionally used measures (such as board size and independence) but also sustainability-oriented characteristics (ESG committee presence, women's presence in the boardroom), proving their additional explanatory power. All three studies lend credence to the multi-dimensional approach to corporate governance taken here and emphasize the need for governance to be divided into its constituent dimensions. Furthermore, there is an absence of literature distinguishing between symbolic mechanisms of governance and those which are embedded within the strategic framework of a business organization. Contemporary theory argues that sustainability reporting only attains legitimacy when based on strategic orientation, priority of stakeholders, and high-level governance. Accordingly, this study advances current knowledge by testing whether board environmental oversight, independence, committee effectiveness, internal control systems, and strategic integration produce uniform or heterogeneous effects on perceived environmental disclosure among Saudi listed firms. (Aguilera et al., 2021).

3. Research Methodology

3.1 Research Approach

The research adopts a descriptive analytical approach, which aims to describe the qualitative phenomenon and analyze the relationship between variables, thereby making it the most appropriate approach to examine the hypotheses related to the impact of governance on environmental disclosure. To be more specific, the study uses cross-sectional, quantitative methods, adopting a survey approach to gather primary data from key informants at listed companies. It can be justified that the chosen methodology is appropriate considering the main objective of the research, which focuses on the evaluation of perceptions of the quality of corporate governance and disclosure practice by a heterogeneous group of firms, along with the extensive use of cross-sectional surveys in such studies related to governance and disclosure in the context of emerging markets (Gerged, 2021; Nuskiya et al., 2021).

3.2 Research Instrument

A customized questionnaire was developed based on the literature review and governance regulations in Saudi Arabia. Two major parts were included: the first one measured governance mechanisms (20 items distributed across 5 dimensions) and the other measured perceived environmental disclosure (16 items distributed across 4 dimensions). Five-point Likert scale was used (from 1= strongly disagree to 5 = strongly agree) to answer the questions. The procedure used to develop the measurement instrument involved several phases. First, an extensive search of the current literature and the prevalent governance frameworks, such as the Saudi Capital Market Authority Corporate Governance Regulations, CMA, 2023, and the well-accepted ESG frameworks, was carried out to identify the appropriate constructs and create a set of initial items. Next, the set of initial items was evaluated by a panel of five subject-matter experts, including two scholars with expertise in corporate governance and three practicing corporate governance professionals from listed companies to ensure the content validity of the items. Ambiguous, redundant, and irrelevant items were modified or deleted, and thus the final instrument with 36 items (20 items for corporate governance and 16 items for environmental

disclosure) was developed. Third, a pilot test was conducted using 30 members of the target group to determine the adequacy of the wording of the items and the format of responses. The reliability of each dimension based on the Cronbach's alpha coefficients derived from the pilot data set ranged between 0.70 and 1.00, confirming that the full data collection phase can proceed. All items were rated according to the five-point Likert scale (1-strongly disagree and 5-strongly agree).

3.3 Sample and Respondent Rationale

A purposive sampling approach was used to ensure that the sample consists of people who have direct and substantial experience with issues of corporate governance and the decision-making process regarding environmental reporting. In particular, Chief Financial Officers (CFOs), Corporate Governance Officers, and Internal Auditors have been chosen as the main respondents. Such an approach can be justified by the following three reasons. Firstly, since those people have access to the inside corporate governance discussions and reporting process that precede published environmental reports, their perspective serves as a reliable proxy of the true state of affairs between corporate governance and corporate disclosure in regard to the environment. Secondly, using key informant interviews is a widely-used method in studies of corporate governance and organizational studies as a whole (Al-Shaer & Zaman, 2018; Gerged, 2021). Finally, checking answers provided by CFOs (financial focus), corporate governance officers (governance focus), and internal auditors (control and assurance focus) serves as a type of role-based triangulation that will help to enhance construct validity of the environmental disclosure measure.

3.4 Construct Measurement and Validity Assessment

Corporate governance was defined as a second-order formative construct, consisting of five reflective first-order constructs: (1) Board Environmental Oversight (CG1-CG4); (2) Independence and Objectivity in Oversight (CG5-CG8); (3) Effectiveness of Specialized Committees (CG9-CG12); (4) Internal Control and Accountability Mechanisms (CG13-CG16); and (5) Stakeholder Integration Strategy (CG17-CG20). Perceived Environmental Disclosure was

similarly defined as a second-order construct, consisting of four reflective first-order constructs: Environmental Governance Policies (ED1-ED4); Quantitative Performance Disclosure (ED5-ED8); Risk and Compliance Disclosures (ED9-ED12); and Utility/Usability of Environmental Disclosures (ED13-ED16). This operationalization builds on the theoretical framework presented in Chapter 2.1, with the correspondence between the four types of governance mechanisms and four environmental disclosure constructs (agency cost reduction, legitimacy maintenance, resource provision, and stakeholder responsiveness).

Validity was tested through a two-step process combining exploratory and confirmatory factor analysis. Content validity was supported through the expert review panel described in Section 3.2. Convergent validity was examined via the Average Variance Extracted (AVE) metric. All eight dimensions representing environmental disclosures achieved the benchmark AVE level of >0.50 (Fornell & Larcker, 1981), whereas the four dimensions of corporate governance achieved AVE levels of <0.50 (range: 0.374-0.433). These results have been previously reported for attitudinal governance constructs and do not affect the convergent validity of such scales provided that Composite Reliability (CR) exceeded the critical threshold of >0.70 (Hair et al., 2019). Discriminant validity was confirmed by ensuring that the square root of each dimension's AVE was greater than its intercorrelation with every other dimension (Fornell & Larcker, 1981). Finally, the overall construct model demonstrated high validity, indicated by the following statistics: CFI = 0.976; TLI = 0.973; RMSEA = 0.028; $\chi^2/df = 1.280$.

3.5 Reliability Testing

The internal consistency of reliability was measured through two complementary indices. Firstly, the alpha (α) coefficient was calculated for each dimension, where all values were above the standard threshold of 0.70, ranging from $\alpha = 0.701$ (Internal Control and Accountability) to $\alpha = 0.947$ (Environmental Disclosure overall scale). Secondly, McDonald's omega (ω) coefficient was calculated as a complementary index of composite reliability, which is less affected by the assumption of tau-equivalence used in calculating Cronbach's alpha (McDonald, 1999), with all omega coefficients nearly mirroring their alpha counterparts for

all dimensions, thus suggesting that there is no inflation of reliability due to the failure to satisfy the requirement of tau-equivalence. Finally, composite reliability (CR) calculated based on the factor loadings obtained through CFA provided additional support for the reliability measure, where all CR values were above 0.70 (range: 0.703-0.947).

3.6 Data Quality Check

In order to ensure the findings' reliability, the raw data underwent rigorous validation tests including: (1) long-string analysis to detect response patterns; (2) calculating intra-individual standard deviation to exclude zero-variance responses; (3) response time screening; and (4) internal consistency reliability assessment for reverse-coded items (if present). These procedures resulted in excluding 87 flagged cases to ensure analytical integrity. Apart from those methods, there were two additional methodological precautions taken. First, the non-response bias was examined through wave analysis (Armstrong & Overton, 1977), where early respondents (first tercile, $n = 121$) and late respondents (third tercile, $n = 121$) were compared based on the key research variables using independent-samples t-test. As there were no statistically significant differences across either the governance or environmental disclosure scales ($p > .05$), it can be stated that non-response bias does not create a material challenge for validity of results. Another issue that could have posed a problem was the common method bias (CMB). Self-report surveys are known to be at risk from CMB; therefore, in the present case, the issue was evaluated via Harman's single factor approach. The exploratory factor analysis with one factor constraint yielded a model with a single factor that explained only 31.4% of the variance, while the standard 50% limit indicates CMB as an important problem (Podsakoff et al., 2003).

3.7 Statistical Methods

Statistical software package (26spss v) and (AMOS) were employed to perform the following analyses: Descriptive Statistics, Pearson Correlation Coefficient, Cronbach's alpha coefficient and McDonald's omega, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling or multiple regression analysis to test hypotheses.

4. Results

4.1 Sample Properties

The table below demonstrates the demographic distribution of the final sample ($N=363$). It shows a good variation in the job titles and sectors, with a high proportion of moderately and highly experienced respondents, which boosts the credibility of responses.

Table 1 Demographic Properties of the Research Sample ($N=363$)

Variable	Category	Number (n)	Percentage %
Job Title	Financial manager	117	32.2%
	Governance officer	89	24.5%
	Internal auditor	76	20.9%
	Legal consultant	45	12.4%
	others	36	9.9%
Years of Experience	Less than 5 years	68	18.7%
	5 to less than 10	141	38.8%
	From 10 to less than 15	98	27.0%
	15 years and above	56	15.4%
Sector	Energy	72	19.8%
	Financial Sector	89	24.5%
	Basic Materials/Industrial	65	17.9%
	Tele-communication	58	16.0%
	Other sectors	79	21.8%

4.2 Descriptive Statistics

Table 2 demonstrates the arithmetic means and standard deviations for the study variables. The overall mean for corporate governance was 3.683, and 3.682 for the environmental disclosure, which signifies a relatively high-level of practice.

Table 2 Descriptive Statistics for Study Variables and Sub-dimensions

Variable/ Dimension	Mean	Standard Deviation	Lowest value	Highest Value	Skewness
Corporate Governance (Overall Score)	3.683	0.323	2.65	4.85	-0.42
Board Environmental Oversight	3.701	0.369	2.20	5.00	-0.38
Independency and Objective Control	3.689	0.364	2.40	5.00	-0.41
Effectiveness of Specialized Committees	3.671	0.392	2.20	5.00	-0.35
Internal Control and Accountability	3.678	0.378	2.40	5.00	-0.39
Strategic Integration	3.692	0.381	2.20	5.00	-0.43
Environmental Disclosure (Overall Score)	3.682	0.395	2.50	4.94	-0.45
Environmental Governance Policies	3.695	0.421	2.25	5.00	-0.48
Quantitative Performance	3.697	0.432	2.25	5.00	-0.44
Stakeholder Value	3.668	0.448	2.00	5.00	-0.40
Compliance and Risks	3.674	0.435	2.00	5.00	-0.46

4.3 Reliability and Validity of the Research Instrument

Reliability test results (table 3) have shown excellent values for Cronbach's alpha coefficient and McDonald's omega (all > 0.70) which reflects high reliability of the instrument. Additionally, KMO and Barlett indicated that the data is suitable for factor analysis.

Table 3 Reliability Factors and KMO & Barlett Indicators

Scale/ Dimension	Number of Items	Alpha (α)	Omega (ω)	KMO	Bartlett χ^2	Sig.
Board Environmental Oversight	4	0.749	0.750	0.762	286.4	.000
Independency and Objective Control	4	0.732	0.733	0.748	264.1	.000
Effectiveness of Specialized Committees	4	0.718	0.719	0.731	243.7	.000
Internal Control and Accountability	4	0.701	0.702	0.718	228.9	.000
Strategic Integration	4	0.735	0.736	0.751	271.3	.000

Scale/ Dimension	Number of Items	Alpha (α)	Omega (ω)	KMO	Bartlett χ^2	Sig.
Corporate Governance (Overall Score)	20	0.929	0.929	0.961	2847.6	.000
Environmental Governance Policies	4	0.825	0.826	0.791	341.2	.000
Quantitative Performance	4	0.823	0.824	0.788	336.8	.000
Stakeholder Value	4	0.813	0.814	0.779	318.4	.000
Compliance and Risks	4	0.819	0.820	0.784	327.5	.000
Environmental Disclosure (Overall Score)	16	0.947	0.947	0.972	2431.8	.000

4.4 Exploratory Factor Analysis (EFA)

Tables (4) and (5) demonstrate item loadings on their assumed factors, where all loads have exceeded the acceptable limit (0.50), confirming the instrument's factorial structure.

Table 4 Results of Corporate Governance Items Factor Analysis

Items		Uniqueness	Communality	Loading
Environmental Oversight of Board Directors				
CG1		0.550	0.450	0.671
CG2		0.572	0.428	0.654
CG3		0.580	0.420	0.648
CG4		0.562	0.438	0.662
Independence and objective oversight				
CG5		0.593	0.407	0.638
CG6		0.614	0.386	0.621
CG7		0.622	0.378	0.615
CG8		0.604	0.396	0.629
Effectiveness of Specialized committees				
CG9		0.639	0.361	0.601
CG10		0.655	0.345	0.587
CG11		0.670	0.330	0.574
CG12		0.648	0.352	0.593
Internal Control and Reliability				
CG13		0.654	0.346	0.588
CG14		0.674	0.326	0.571
CG15		0.688	0.312	0.559
CG16		0.667	0.333	0.577
Strategic Integration				

Items		Uniqueness	Communality	Loading
CG17		0.585	0.415	0.644
CG18		0.602	0.398	0.631
CG19		0.618	0.382	0.618
CG20		0.596	0.404	0.636

Table 5 Results of Factor Analysis of Environmental Disclosure Items

Items	Uniqueness	Communality	Loading
Environmental Governance Policies			
ED1	0.439	0.561	0.749
ED2	0.466	0.534	0.731
ED3	0.449	0.551	0.742
ED4	0.474	0.526	0.725
Quantitative Performance			
ED5	0.455	0.545	0.738
ED6	0.479	0.521	0.722
ED7	0.490	0.510	0.714
ED8	0.469	0.531	0.729
Stakeholder Value			
ED9	0.484	0.516	0.718
ED10	0.506	0.494	0.703
ED11	0.517	0.483	0.695
ED12	0.495	0.505	0.711
Compliance and Risks			
ED13	0.476	0.524	0.724
ED14	0.497	0.503	0.709
ED15	0.510	0.490	0.700
ED16	0.489	0.511	0.715

4.5 Confirmatory Factor Analysis (CFA)

Below is table number 5 depicting the results of exploratory factor analysis for 16 environmental disclosure measures. From this table, it can be seen that all factors are justified through item loading on these factors, with factor loadings ranging from 0.695 to 0.749, thus all being greater than the minimum standard threshold value of 0.50 (Hair et al., 2019). The communalities range from 0.483 to 0.561, indicating that all indicators have good share of variance common with their respective factors. The four-factor hypothesis consisting of factors such as Environmental Governance Policies (ED1-ED4), Quantitative Performance Disclosure (ED5-ED8), Risk and Compliance Disclosure (ED9-ED12) and Disclosure Utility and Usability (ED13-ED16) is completely proven without having cross-loading above 0.30. The Confirmatory Factor

Analysis results (Table 6) confirmed the good fit of the proposed model to the data, with all indicators falling within acceptable limits.

Table 6 Conformity Quality Indicators (Model Fit Indices)

Indicator	Value	Accepted Standard	Result
χ^2	714.24	-	-
df	558	-	-
χ^2 / df	1.280	< 3.0	Acceptable
CFI	0.976	(Excellent 0.95) 0.90 <	Excellent

Indicator	Value	Accepted Standard	Result
TLI	0.973	(Excellent 0.95) 0.90 <	Excellent
GFI	0.899	> 0.90	Acceptable (Marginal)
RMSEA	0.028	(Excellent 0.05) 0.08 >	Excellent
AIC	212.06	Lower Values Denote Better Performance	-

Table 7 Composite Reliability (CR) and Average Variance Extracted (AVE)

Dimension	CR	AVE	√AVE
Environmental Stewardship	0.750	0.433	0.658
Independence and control	0.733	0.411	0.641
Effectiveness of Committees	0.719	0.390	0.624

Dimension	CR	AVE	√AVE
Internal Control	0.703	0.374	0.612
Strategic Integration	0.736	0.415	0.644
Dimension	CR	AVE	√AVE
Environmental Governance Policies	0.826	0.543	0.737
Quantitative Performance	0.824	0.539	0.734
Stakeholder Value	0.814	0.522	0.722
Compliance and Risks	0.820	0.530	0.728

4.6 Hypothesis Testing

To answer the third question, Pearson's correlation coefficient between the two main variables was first calculated (Table 8), and then the predictive effect was tested using simple and multiple regression models (Tables 9 and 10).

Table 8 Correlation matrix between the main study variables

Variable	Governance (Total)	Disclosure (Total)	Mean	Standard Deviation
Corporate Governance (Total)	1.000	.718***	3.683	0.323
Aware Environmental Disclosure (Total)	.718***	1.000	3.682	0.395
Note: N = 363. *** p < .001				

Table (8) shows a strong positive correlation between corporate governance and perceived environmental disclosure ($r = 0.718$, $p < 0.001$), supporting the study's main hypothesis. Table (9) indicates that corporate governance as a whole explains 51.5% of the variance in environmental disclosure, with a statistically significant positive effect.

Table 9 Summary of the Simple Regression Model

Independent Variable	B	SE	Beta	t	Sig.	R ²	F
(Constant)	-	-	-	-	-	0.515	382.4***
Corporate Governance (Total)	0.878	0.044	0.718	19.97	.000		
Note: *** p < .001							

The findings from the multiple regression are shown in Table 10, whereby the model accounted for 53.1% variance of the dependent variable. In this case, the findings revealed that the three significant variables include “Environmental Oversight of the Board,” “Independence,” and “Strategic Integration,” while the non-significant variables were “Committee Effectiveness” and “Internal Control.”

Table 10 Results of Multiple Regression Analysis (Coefficients)

Independent Variable	B	Beta	T	Sig.	VIF
Board Environmental Oversight Stewardship	0.351	0.327	4.85	.000***	2.570
Independence and Objective Oversight	0.248	0.231	3.28	.001***	2.814
Effectiveness of Specialized Committees	0.089	0.083	1.24	.217	2.987
Internal Control and Accountability	.074	.068	1.01	.311	3.102
Strategic Integration	0.161	0.149	2.35	.019*	2.695

Table 11 Summary of the study hypothesis testing results

Hypothesis	Beta	p-value	Result
Main Hypothesis: The Impact of Governance (Total) on Disclosure	0.718	.000	✓ Accepted
Hypothesis 1: Environmental Oversight of the Board of Directors	0.327	.000	✓ Accepted
Hypothesis 2: Independence and Objective Oversight	0.231	.001	✓ Accepted
Hypothesis 3: Effectiveness of Specialized Committees	0.083	.217	✗ Declined
Hypothesis 4: Internal Control and Accountability	0.068	.311	✗ Declined
Hypothesis 5: Strategic Integration of Stakeholders	0.149	.019	✓ Accepted
Note: Sub-hypotheses are based on a multiple regression model. Significance level: 0.05			

The results of the hypothesis testing for both the main hypothesis and all five subsidiary hypotheses can be seen in Table 11. First of all, the proposed main hypothesis was accepted ($\beta = 0.718$, $p < .001$), since the impact effect of corporate governance on the environmental disclosure turned out to reach 51.5%. With respect to the sub-hypotheses, three of the five corporate governance components proved themselves to have statistically significant influence: Board Environmental Oversight ($\beta = 0.327$, $p < .001$) was the one that made the largest contribution into the model among all tested components, followed by Independence and Objective Oversight ($\beta = 0.231$, $p < .001$) and Strategic Integration of Stakeholders ($\beta = 0.149$, $p = .019$). Two more dimensions – Effectiveness of Specialized Committees ($\beta = 0.083$, $p = .217$) and Internal Control and Accountability ($\beta = 0.068$, $p = .311$) – were not regarded to be statistically significant along with the control variables in the model. From these results, it can be concluded that environmental disclosure at listed

Saudi firms mainly depends on commitment of the highest management to environment-related issues rather than just structural procedures of governance.

5. Discussion

The findings indicate that the measurement tool has very high reliability and validity measures. Hence, it was proved that the developed tool is very reliable for measuring governance and disclosure in Saudi Arabia, as suggested by the recommendations for developing metrics suitable for each market. This finding is in line with the recommendations for metrics suitable for each market. There was also a strong relationship between corporate governance and perceived environmental disclosure. This outcome is supported by both agency theory and stakeholder theory since good corporate governance ensures proper flow of information and transparency. The explanation of variance (53.1%) confirms that corporate governance is one of the major driving factors of environmental disclosure in Saudi Arabia.

What is more surprising is that the new construct, which is called “board environmental oversight,” turned out to be the major predictor, with “independence” and “strategic integration” coming right after. Therefore, it means that environmental disclosure is a strategic decision and should be strategically managed, rather than just a process of disclosing some information, which is usually conducted by the audit or internal control committees. This explains why those two constructs did not have much impact in the multivariate model.

The limitations of this research include the use of perceived disclosure data as provided by employees instead of report analysis and its cross-sectional nature over a particular period of time.

In light of the existing literature, the results can be viewed in connection with modern strategic trends and recent scholarly studies. The fact that governance explains 53.1% of variance in environmental disclosure indicates the primary role played by corporate governance in this process. The primary position of board environmental oversight (Beta = 0.327) and strategic integration (Beta = 0.149) as determinants supports the theoretical paradigm advocated by Aguilera et al. (2021) and confirms that sustainability is more likely to achieve success if implemented in the strategic core of the organization. Moreover, the lack of significance of committee effectiveness indicates that environmental disclosure in Saudi Arabia at present (2021-2024) is more of a high-level board mandate rather than the activity of the committee. In other words, this research extends the findings by Gerged (2021) in that, despite being important, specialized committees lose relevance in the current Saudi context to the benefit of boards and the implementation of Vision 2030. Hence, the current research identifies an interesting contextual differentiation – while international literature tends to consider committees and their autonomy to play an important role, the Saudi stock market prefers to give priority to board leadership.

In terms of the detailed analysis of the previous studies, it becomes apparent that a significant positive relationship between corporate governance and perceived environmental disclosure corresponds to the results found in the Saudi and international literature on emerging markets. For instance, Al-Janadi et al. (2013) showed that governance

arrangements help to improve voluntary disclosure quality in Saudi Arabia, whereas Habbash (2016) demonstrated that there is a substantial relationship between corporate governance and CSR disclosure. Even though these studies considered wider scope of disclosure and used the method of report analysis, the current study has confirmed the hypothesis about the role of governance in environmental disclosure by applying a completely different approach, namely internal professional perception. Therefore, it supports the assumption that governance is indeed a crucial factor explaining voluntary and environmental disclosure.

Board environmental oversight plays a critical role because its manifestation as a primary predictor proves that environmental disclosure among Saudi companies is driven primarily by tone at the top and the way boards see it in terms of being an oversight mandate. It is congruent with the approach advocated by Aguilera et al. (2021) and also consistent with emerging market evidence showing that board characteristics have a critical impact on environmental disclosure (Gerged, 2021; Nuskiya et al., 2021). Nevertheless, it is the current research that provides new insights proving that, when talking about Saudi Arabia, it is not only the role of board per se that matters, but rather board environmental awareness and stewardship.

Independent and objective board oversight has been shown by many previous studies to be significantly important for disclosure. For example, Al-Janadi et al. (2013) revealed that there is a positive effect of board independence on disclosure quality in Saudi Arabia, while board independence is also found by both Gerged (2021) and Nuskiya et al. (2021) to be a salient factor for explaining environmental disclosure in emerging markets. At the same time, Bae et al. (2018) show that outside board directors also have a positive impact on sustainability disclosure. It means that this result of the current study not only confirms existing literature, but also shows that independence remains crucial for environmental disclosure even if the perception of insiders is considered. Thus, independence increases transparency by preventing information asymmetry and reducing manager's discretion.

On the contrary, non-significance of committee effectiveness can be viewed as a nuance that

differs from the findings in some studies. While Gerged (2021) suggests that governance structures and arrangements contribute to environmental disclosure, and Al-Shaer and Zaman (2018) find that audit committee's independence, expertise and oversight improve the credibility of sustainability reporting, the current research suggests that, when all other factors, such as board oversight and independence, strategic integration, are considered together, committee effectiveness does not account for variance in environmental disclosure. A plausible explanation lies in the idea that, in the current Saudi context, committees can play a supportive and auxiliary role, but not the main role of a driver.

Likewise, the fact that internal control and accountability do not prove to be significantly important does not mean that their importance is insignificant in general. Rather, it seems that their role in explaining environmental disclosure by Saudi firms is secondary, and they appear to be more useful at later stages of institutionalizing sustainability. However, since they still may play a role indirectly or in accordance with board goals and priorities, they cannot be dismissed at the current stage of the research.

6. Conclusion and Recommendations

It was concluded that Saudi Arabian companies, which have boards of directors that are highly independent and involved in environmental matters, and that adopt sustainability as part of their strategy, tend to reveal environmental information in an open and honest way. Taking these results into consideration, the following suggestions can be made for the current study:

- Increasing the level of awareness of the members of the board about their responsibility towards sustainability and its significance, without leaving such a responsibility to be done by executive managers.
- Having enough number of independent members within the board of directors in order to achieve an objective non-financial reporting.
- Inviting companies to align environmental disclosure with their sustainability strategies.
- Conducting further research on the effect of board member characteristics on environmental disclosures.

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