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Corporate Governance and Environmental Citizenship in Global Hospitality: A Cross-National Empirical Study

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Abstract: The hospitality industry's global reach and resource-intensive operations have placed it under growing scrutiny for environmental impact. This empirical study examines how corporate governance influences corporate environmental citizenship (CEC) among eight major hotel companies across North America, Europe, and Asia from 2020 to 2023. Drawing on agency, stakeholder, institutional, and legitimacy theories, the study hypothesizes that stronger governance—measured by board independence, separation of CEO and Chair roles (non-duality), and ownership concentration—positively relates to environmental performance. A panel dataset of 32 firm-year observations is analyzed using regression models. The results show that higher board independence and greater ownership concentration are associated with significantly improved CEC index scores, while CEO duality corresponds with weaker environmental performance. The findings represent one of the first cross-national empirical demonstrations of governance–CEC links in hospitality, offering theoretical insights and practical guidance. Overall, the evidence suggests that robust governance mechanisms can serve as catalysts for environmental stewardship in the hotel sector.

Keywords: corporate governance; environmental performance; hospitality industry; corporate environmental citizenship; sustainability; board independence; CEO duality; ownership structure; stakeholder theory

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1. Introduction

The global hospitality sector plays a pivotal role in addressing sustainability challenges due to its significant environmental footprint and high public visibility. Hotels and related lodging enterprises consume vast amounts of energy and water and generate substantial waste, contributing to the tourism industry's estimated 8% share of global greenhouse gas emissions [1]. As stakeholders—including environmentally conscious guests, investors, regulators, and local communities—demand greener operations, hospitality firms face increasing pressure to demonstrate corporate environmental citizenship (CEC). CEC refers to voluntary corporate initiatives that reduce environmental impact and contribute positively to sustainability beyond mere legal compliance. Examples in hospitality include energy efficiency upgrades, renewable energy adoption, water conservation, waste reduction programs, and biodiversity protection efforts. The effectiveness of these initiatives often hinges on corporate governance quality, as governance provides the framework for accountability, oversight, and strategic alignment of sustainability goals [2,3]. However, the specific governance factors that drive stronger environmental performance in hotels remain underexplored. This study addresses that gap by examining how governance practices influence CEC in a cross-national sample of leading hotel companies.

The research is grounded in four complementary theoretical perspectives. Agency theory [4] suggests that robust governance mechanisms align managers' actions with shareholders' long-term interests, potentially including sustainability objectives. From this view, independent boards and checks on executive power can mitigate managerial tendencies to shirk costly environmental investments [5]. Stakeholder theory [6] argues that firms must serve broader societal and environmental interests to maintain success, implying that governance structures should facilitate consideration of guests, employees, communities, and the planet alongside shareholders. Institutional theory [7] posits that organizations conform to normative pressures and regulatory expectations in their environment; thus, hospitality companies with governance attuned to global sustainability norms may be more proactive in CEC. Finally, legitimacy theory [8] holds that businesses undertake socially desirable actions (like environmental programs) to legitimize themselves in the eyes of stakeholders. Strong governance can enhance such legitimacy-seeking efforts by ensuring transparent reporting and credible commitment to green initiatives. By integrating these perspectives, it is proposed that certain governance attributes (e.g., more independent boards, separation of CEO and board chair roles, and concentrated ownership stakes) create conditions conducive to elevated environmental performance in hotel companies.

This study's novel contribution lies in its cross-national, quantitative analysis of governance and environmental outcomes in the hospitality context. Prior research has examined general links between corporate governance and environmental performance in manufacturing and other industries [9,10]. However, the hotel industry's unique stakeholder exposure and service-oriented operations warrant focused investigation [11]. Panel data from eight prominent publicly listed hotel firms headquartered in the United States, Europe, and Asia over the period 2020–2023 were analyzed. By spanning multiple countries and the tumultuous COVID-19 timeframe, this study captures variation in both governance practices and environmental performance under different institutional and market conditions. The central research question is as follows: How do corporate governance practices influence corporate environmental citizenship in the global hospitality industry? In pursuit of this inquiry, the objectives of the study are to empirically assess the impact of key governance attributes on environmental performance and to determine whether stronger governance mechanisms correspond with higher levels of CEC. Answering this question sheds light on whether governance reforms could be an effective lever for improving sustainability in hotels worldwide. In doing so, the findings contribute to the hospitality management literature on sustainability [5] and inform both theory and practice regarding the governance–sustainability nexus.

The remainder of this paper is organized as follows. Section 2 reviews relevant literature on corporate governance and environmental performance, with a dedicated discussion of environmental citizenship in hospitality. In Section 3, hypotheses are developed linking specific governance variables to CEC. Section 4 details the data and methodology, including construction of a CEC index from sustainability metrics and the panel regression approach. Section 5 presents results, and Section 6 discusses the implications of the findings through theoretical lenses and in comparison, to prior studies. The research concludes in Section 7 with a summary of contributions, practical recommendations for industry stakeholders, and suggestions for future research, along with acknowledged limitations.

2. Literature Review

2.1. Corporate Governance and Environmental Performance

Extant research generally suggests that strong corporate governance can facilitate better environmental and social performance by firms [5]. Governance mechanisms such as board oversight, incentive alignment, and shareholder monitoring may encourage management to invest in sustainability initiatives that might otherwise be overlooked [3]. For example,

independent directors who are not part of management can provide impartial scrutiny of corporate strategies and are more likely to consider long-term risks, including environmental impacts [9]. Prior studies across industries find that greater board independence correlates with lower carbon emissions and more proactive climate practices. Kim et al. (2023) [10] report that in South Korean companies, firms with a higher proportion of independent board members achieved significantly larger reductions in greenhouse gas emissions, reinforcing the idea that independence bolsters environmental oversight. Similarly, the presence of dedicated board-level sustainability committees or directors with environmental expertise has been linked to improved environmental outcomes [5]. These governance structures institutionalize environmental responsibility at the highest level of decision-making.

Conversely, certain governance weaknesses may hinder environmental performance. Concentration of power in a dual CEO–Chairperson role (i.e., CEO duality) can reduce board vigilance and lead to managerial entrenchment, potentially deprioritizing sustainability [4]. In general, corporate settings, evidence on CEO duality's impact is mixed—some studies find no association with environmental outcomes [12], while others suggest that separating the CEO and board chair positions yields more independent oversight conducive to better ESG performance. In the hospitality sector specifically, Arici, Aladag, and Koseoglu (2024) [13] found that CEO duality was associated with lower ESG scores across a global sample of hospitality and tourism firms. However, the effect was conditional—strong governance mechanisms (e.g., board independence) and favorable financial indicators could mitigate the negative consequences. This suggests that CEO duality impairs environmental oversight unless balanced by other institutional safeguards. Given the industry's complexity and large geographically dispersed operations, a unified leadership structure might struggle to simultaneously prioritize expansion, financial returns, and environmental programs. Thus, separating the roles could improve accountability and focus on sustainability goals.

Another governance factor, ownership structure, has garnered attention for its influence on corporate priorities. Ownership concentration refers to the extent of shareholding by large blockholders (such as founder families, institutional investors, or state owners). Concentrated owners often possess both the incentive and the power to influence firm strategies. If these dominant shareholders have a long-term investment horizon or reputational stake—as is typical for families or sovereign wealth funds in hotel companies—they may push management towards sustainability to protect the firm's longevity and brand [14]. Indeed, research in other industries has found that firms with higher ownership concentration or significant institutional ownership tend to exhibit more transparency in sustainability reporting and stronger ESG performance [15,16]. However, the effect can depend on the type of owner: dedicated long-term investors are likelier to champion environmental initiatives than transient shareholders focused on short-term profits [17]. For global hotel corporations, many of which have founding families or governments among their major shareholders (e.g., the Pritzker family in Hyatt, the Hong Leong group in Millennium & Copthorne, sovereign funds in Accor), ownership concentration could align corporate values with sustainability and provide the support needed for substantial CEC efforts.

In summary, the literature suggests three governance attributes as particularly relevant to environmental performance: board independence, CEO duality, and ownership concentration. Greater board independence tends to enhance environmental accountability [10]. CEO duality may impair effective oversight, and concentrated ownership can either promote or discourage sustainability depending on owner interests [9,18]. These insights, mostly derived from manufacturing or multi-industry studies, set the stage for examining whether similar patterns hold in the hospitality context. The hotel industry's reliance on customer trust and public reputation [11] implies that governance-driven improvements in environmental stewardship could be especially beneficial. Yet, the unique operational features

of hospitality—high fixed costs, service quality imperatives, and franchise or asset-light business models for some firms—might modulate the governance–sustainability relationship. Furthermore, emerging evidence suggests that transformational leadership—which encourages vision-driven, adaptive, and knowledge-sharing cultures—may also complement formal governance structures in promoting environmental and organizational performance [19]. In the hospitality context, where organizational culture and employee engagement are crucial, such leadership behaviors could enhance the effectiveness of sustainability initiatives by aligning operational knowledge with strategic environmental goals. The next subsection of the literature review examines how environmental citizenship manifests in hospitality and tourism, providing context for the hypotheses.

2.2. Environmental Citizenship in Hospitality and Tourism

Environmental sustainability has become a central concern in hospitality and tourism, giving rise to the notion of corporate environmental citizenship specific to this sector. Hospitality companies operate properties in diverse communities and ecosystems, and their daily activities (heating/cooling rooms, laundering linens, food service, etc.) directly impact local and global environments. As a result, stakeholders increasingly expect hotels to act as "environmental citizens" by adopting eco-friendly practices and contributing to conservation efforts. Over the past decade, many hotel chains have responded with initiatives such as installing energy-efficient lighting and HVAC systems, sourcing renewable energy, implementing comprehensive recycling and food waste reduction programs, eliminating single-use plastics, and obtaining green building certifications (e.g., LEED, Green Key). These actions not only reduce environmental harm but can also yield cost savings and marketing advantages. For instance, hotels that achieve recognized sustainability certifications often enjoy enhanced brand image and can attract a growing segment of eco-conscious travelers [20]. Research has shown that guests' satisfaction and willingness to pay can be positively influenced by visible "green" attributes of hotels, provided those initiatives meet guest expectations [21].

Despite notable progress, the hospitality industry still faces significant environmental challenges. A large portion of hotels' environmental impact stems from high consumption of non-durable goods, energy, and water, which in turn leads to emissions and waste [21]. It is estimated that around 75% of hotels' environmental impact is attributable to excessive use of energy and water and the generation of waste and sewage [21]. These impacts are magnified in destinations where tourism infrastructure strains local resources. Moreover, hospitality companies often operate across multiple countries with varying environmental regulations and stakeholder expectations. This exposes them to diverse institutional pressures: for example, European-based hotel firms have faced strict EU sustainability directives and shareholder activism on climate change, while those in emerging markets may encounter nascent regulatory frameworks but growing community concerns about tourism's footprint. Institutional theory predicts that global hotel companies will adopt environmental practices not just in response to local laws, but also to international norms and best practices that confer legitimacy [7]. Indeed, many large hotel groups voluntarily publish annual sustainability or ESG reports aligned with standards like the Global Reporting Initiative, indicating a recognition that transparent environmental citizenship is now part of industry legitimacy [2].

In addition to external pressures, internal culture and leadership within hospitality firms play a role in advancing environmental citizenship. Studies have highlighted the importance of green organizational culture and empowered employees in implementing sustainable operations [22]. Training staff to embrace conservation (e.g., encouraging towel reuse programs or promptly fixing leaks) and incentivizing management via environmental

performance targets are common tactics. Leadership commitment from the top is crucial: hotel CEOs who prioritize sustainability often set the tone for company-wide initiatives and allocate resources accordingly [19]. Conversely, if top management is lukewarm on environmental issues, even well-designed initiatives may falter due to lack of enforcement or enthusiasm at the property level. This underscores why linking environmental goals to governance—such as tying executive bonuses to sustainability metrics or having board committees dedicated to CSR—can be impactful in hospitality companies [23].

Overall, the literature portrays corporate environmental citizenship in hospitality as a multidimensional effort shaped by both external accountability and internal governance. Industry studies in the Sustainability journal have documented a range of sustainable practices in hotels and their positive effects on operational efficiency and stakeholder perceptions [5,24]. Nevertheless, significant variability exists among firms: some hotel companies are clear frontrunners in sustainability, while others lag behind or engage in only symbolic "greenwashing" efforts. These differences invite investigation into underlying factors—notably, whether stronger corporate governance systematically aligns hotels with more substantive environmental citizenship. In the following section, hypotheses are developed that formally link governance attributes to environmental performance outcomes in the hospitality sector, drawing on the theoretical and empirical insights discussed.

3. Hypotheses Development

Building on the above review, three hypotheses are proposed concerning how specific corporate governance characteristics influence the degree of corporate environmental citizenship in hotel companies. These hypotheses focus on board independence, CEO duality, and ownership concentration as key predictors, consistent with agency and stakeholder theoretical arguments. Figure 1 illustrates the study's conceptual framework.

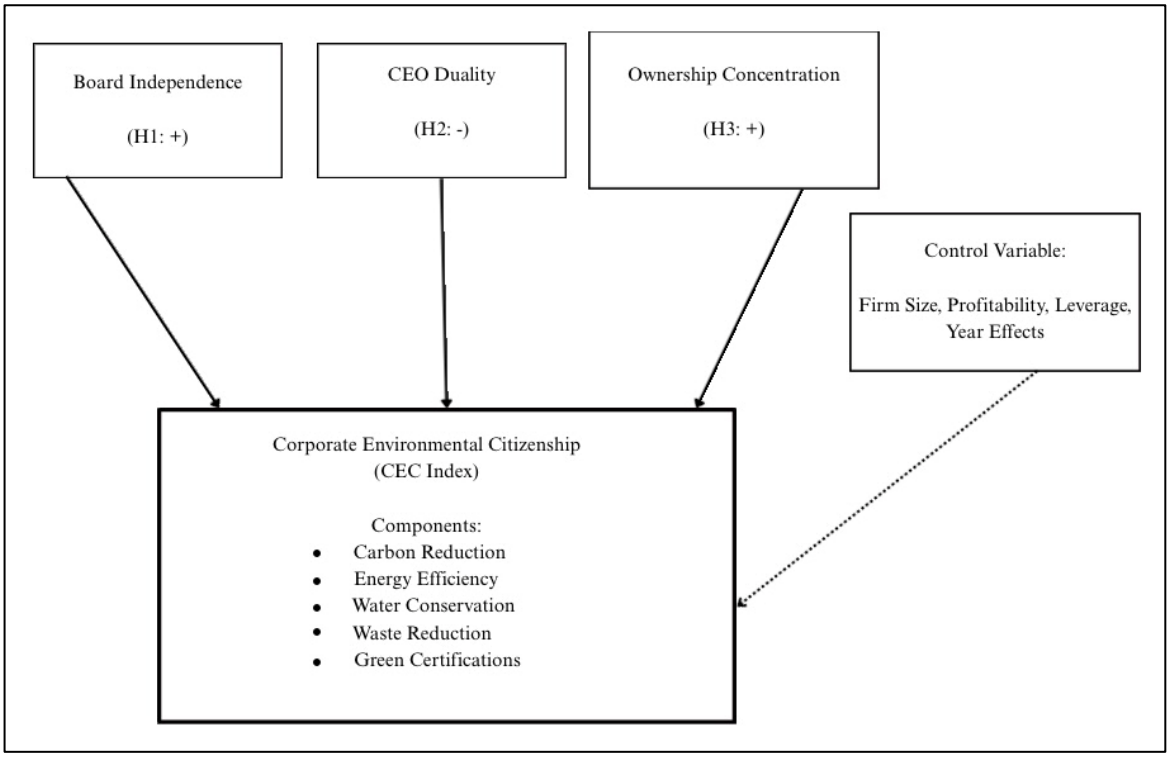

Figure 1. Conceptual framework linking corporate governance variables to environmental performance (CEC) in hospitality.

H1: *Board independence is positively associated with corporate environmental citizenship in the hospitality sector.*

Justification: A higher proportion of independent directors on the board should strengthen oversight of management and encourage attention to long-term stakeholder interests, including environmental sustainability. Independent directors bring an external perspective and are less beholden to the CEO, enabling them to advocate for proactive environmental strategies [9]. In hotel firms, independent boards are expected to push for rigorous sustainability goals (e.g., carbon reduction targets, green certifications) and ensure management allocates adequate resources toward achieving them. This leads to superior environmental performance outcomes. It is therefore hypothesized that firms with more independent boards will exhibit higher CEC index scores.

H2: *CEO duality is negatively associated with corporate environmental citizenship in the hospitality sector.*

Justification: When the roles of Chief Executive Officer and Board Chair are held by the same individual (CEO duality), the concentration of power may weaken the board's ability to objectively evaluate and influence the firm's environmental agenda [4]. With fewer checks and balances, a dual CEO–Chair could deprioritize costly sustainability projects, especially if short-term financial pressures conflict with long-term environmental investments. In the hospitality industry, separating the CEO and Chair positions is likely to facilitate more independent board oversight and more effective questioning of management decisions related to sustainability. Therefore, it is hypothesized that hotel companies with a non-dual leadership structure (separate CEO and Chair) will achieve higher levels of environmental citizenship, whereas those with CEO duality will tend to have lower CEC performance.

H3: *Ownership concentration is positively associated with corporate environmental citizenship in the hospitality sector.*

Justification: The presence of a concentrated owner (or a coalition of large shareholders) can align the firm's objectives with longer-term value preservation, which increasingly encompasses environmental sustainability. In many global hotel firms, major shareholders such as founding families or institutional investors have reputational capital at stake and a vested interest in the firm's enduring success. These blockholders can exert pressure on management to improve sustainability practices as part of securing the company's future and mitigating environmental risks. For example, a family-controlled hotel group may embrace strong environmental stewardship to protect the family name and legacy [12], and institutional investors often promote ESG improvements to reduce risk and enhance company valuation [15]. Consequently, it is expected that higher ownership concentration (measured by the largest shareholder's equity stake) correlates with better CEC outcomes. Notably, this hypothesis assumes that the dominant owners in the study's sample have a pro-sustainability stance; it is acknowledged that if a blockholder were indifferent or hostile to environmental initiatives, high ownership concentration could theoretically impede CEC. However, given the generally positive engagement of major investors in ESG issues in recent years [25], this study posits a positive net effect in the hospitality context.

In summary, the hypotheses predict that board independence and ownership concentration will be drivers of improved corporate environmental citizenship, while CEO duality will be a detractor. These propositions will be tested in a quantitative model controlling for other factors, as described in the next section. Confirmation of the hypotheses would underscore the importance of governance reforms (e.g., increasing independent board members, appointing separate board chairs, and encouraging active shareholder stewardship) as levers for enhancing sustainability performance in hospitality firms. Figure 1 conceptually summarizes the expected relationships.

4. Materials and Methods

4.1. Sample and Data Sources

This study examined a sample of 8 leading publicly traded hospitality companies with extensive international operations, observed over a four-year period from 2020 through 2023 (yielding 32 firm-year observations). These firms—which include globally recognized hotel groups headquartered in the United States, Europe, and Asia—were selected based on their prominence in the industry and the availability of comprehensive Environmental, Social, and Governance (ESG) disclosures during the study period. Focusing on large, internationally active hotel corporations provides a relevant context for studying corporate governance and environmental performance, as these companies are subject to diverse stakeholder pressures and have more formalized governance structures.

The sample consists of eight leading publicly traded hospitality companies with extensive international operations: Accor S.A. (Issy-les-Moulineaux, France) [26–29], Hilton Worldwide Holdings (McLean, TX, USA) [30–34], InterContinental Hotels Group (Windsor, UK) [35–38], Marriott International (Bethesda, MD, USA) [39–42], Melía Hotels International (Palma de Mallorca, Spain) [43–47], Radisson Hotel Group (Brussels, Belgium/Shanghai, China) [48–51], Wyndham Hotels & Resorts (Parsippany, NJ, USA) [52–55], and Choice Hotels International (North Bethesda, MD, USA) [56–58]. These firms were chosen due to their prominence and comprehensive ESG reporting practices from 2020 to 2023, a period encompassing the significant industry disruptions of COVID-19. This sample provides substantial cross-national representation and variation in governance structures, allowing for robust exploratory analysis despite the modest sample size (32 firm-year observations). Data were meticulously gathered from annual, proxy, and ESG reports, cross-verified with third-party ESG databases to ensure accuracy and comparability. Governance data, such as board independence, CEO duality, and ownership concentration, were derived from official investor relations disclosures.

Data on corporate governance attributes and environmental performance were collected from multiple sources. Governance characteristics (board independence, CEO duality, ownership concentration) and financial/control variables were obtained primarily from annual reports, proxy statements, and official filings (e.g., Form 10-K for U.S. firms, annual reports/registration documents for European firms, etc.). In particular, information on board composition and leadership structure was hand-collected from corporate governance reports and proxy disclosures, while ownership concentration data (percentage of shares held by the largest shareholder) were derived from shareholder ownership summaries in annual reports or proxy statements. Firm size (measured as the natural log of total assets), profitability (return on assets, ROA), and leverage (debt-to-assets ratio) were also gathered from financial statements in these reports.

Environmental performance data were drawn from company sustainability reports and related disclosures. Many of the sample firms publish annual sustainability or corporate responsibility reports detailing their environmental initiatives and outcomes. Key environmental indicators were extracted from these documents, including metrics on car-

bon emissions, energy usage, water usage, waste management, and any environmental certifications or awards. Additional qualitative information (e.g., descriptions of initiatives) was reviewed to supplement the quantitative metrics. To construct a standardized measure of corporate environmental citizenship (CEC), these various indicators were compiled and normalized as described in Section 4.2. All data sources used (annual reports, sustainability reports, etc.) are publicly available, and specific document references for each firm and year are listed in the References for transparency.

While rigorous, this study acknowledges the limitations inherent to its modest panel size (N = 32), which constrains generalizability and precision of statistical estimates. The analysis thus emphasizes significance and directionality over precise effect magnitudes, and careful interpretation of results is advised given the sample scope.

4.2. Measures and Construction of CEC Index

Corporate Environmental Citizenship (CEC) Index: The dependent variable is an index representing each firm's overall environmental performance and commitment to sustainability (corporate environmental citizenship). To build the CEC index, five key environmental performance dimensions were selected based on common themes in hospitality sustainability reporting and prior literature [2,21]: (a) Carbon emissions reduction, (b) Energy efficiency improvements, (c) Water conservation efforts, (d) Waste reduction and recycling, and (e) Attainment of green certifications or awards. For each firm-year, quantitative metrics in these categories were collected where available (e.g., percent reduction in carbon emissions year-over-year, energy use per room night, water use per guest night, recycling rate, number of properties with a green certification, etc.). Since not all indicators were reported on the same scale, each metric was first standardized (e.g., converted to a z-score or normalized 0–100 scale). Qualitative achievements (such as obtaining a certification) were converted into scored indicators (e.g., presence or absence, or count of certifications).

The standardized component scores were then averaged (with equal weighting) to produce an overall CEC index score for each firm-year, scaled from 0 to 100 for interpretability (100 representing the highest observed overall environmental performance among sample firms, 0 the lowest). This composite index approach treats each of the five areas as contributing equally to a firm's environmental citizenship. In the sample, CEC index values ranged from 50.0 (minimum) to 85.0 (maximum) with a mean of about 70 (on the 0–100 scale), indicating substantial disparities in environmental performance among these leading hotel companies. It is acknowledged that the CEC index involves some subjective components (e.g., scoring of qualitative initiatives and the decision to weight components equally). However, the index provides a comprehensive snapshot of a firm's environmental engagement across multiple facets, which is suitable for comparative and regression analysis in this exploratory study. (In the Conclusion/Future Research, further discussion is provided on the limitations of this measure and potential refinements.)

Board Independence (%): The main independent variable H1 is operationalized as the percentage of board directors who are independent (non-executive, with no management role or significant business ties to the firm). This ratio was obtained from corporate governance disclosures, typically calculated as number of independent board members divided by total number of board members $\times$ 100. For the sample firms, board independence ranged from 55% to 90% (mean ~72%), reflecting generally high levels of independent oversight consistent with large publicly listed companies. A higher value indicates a greater proportion of independent directors, which is hypothesized to positively influence CEC.

CEO Duality (0/1): To test H2, CEO duality was coded as a binary variable indicating whether the roles of CEO and Board Chair are held by the same person. A value of

1 signifies duality (the CEO is also chairperson of the board), and 0 signifies non-duality (separate individuals in each role). Within the 32 observations, CEO duality was present in a small subset (12.5% of firm-years, i.e., in one of the eight firms consistently over the period). This low incidence underscores that most sampled companies had already separated the CEO and Chair roles, but the one firm with duality provides variation for analysis. The expectation is that CEO duality (value 1) will associate with lower CEC outcomes.

Ownership Concentration (%): Ownership concentration (H3) is measured as the percentage of shares owned by the largest single shareholder (or ownership block) of the company. This figure was obtained from shareholder information in annual reports or ownership filings, and it captures the degree to which a firm's equity is concentrated. In the sample, the largest shareholder's stake ranged widely, from about 5% up to 50% (mean ~22.5%), depending on the firm (some had dispersed ownership, others had a family or holding company with a major stake). A higher percentage indicates more concentrated ownership. Based on H3, higher ownership concentration is anticipated to correlate with higher CEC (assuming the dominant owner supports sustainability efforts).

Control Variables: Several control variables were included to account for other factors that might influence environmental performance. Firm size is measured as the logarithm of total assets (in USD)—larger firms might have more resources for sustainability programs but also larger operations to manage. Profitability is captured by return on assets (ROA, in percent), as more profitable firms could potentially invest more in sustainability, although some literature suggests a mixed relationship with CSR. Leverage (debt-to-assets ratio) is included to control for financial structure, since highly leveraged companies may face resource constraints that impact discretionary initiatives like sustainability. Additionally, year dummies for 2021, 2022, and 2023 (with 2020 as the reference year) are incorporated to control for temporal effects such as general trends or external shocks (e.g., the COVID-19 pandemic's impact on 2020). No country-level dummies are used because each firm operates globally and because firm fixed effects (see Section 4.3) effectively capture any time-invariant home country differences. Given the small sample, only the most relevant controls were included to preserve degrees of freedom.

Descriptive Statistics: Table 1 presents descriptive statistics for all variables along with the Pearson correlation matrix. The mean CEC Index score was 70.3 (out of 100) with a standard deviation of 9.8, indicating moderate variation in environmental performance across observations. Mean board independence was 72%, and mean ownership concentration was 22.5%. CEO duality, as noted, had a mean of 0.125 (only 12.5% of observations had dual leadership). The firms were quite large (mean log assets ~10.21, roughly equating to $27 billion in assets) but exhibited low average profitability during this period (mean ROA~2.1%, reflecting the industry's deep losses in 2020 and partial recovery by 2023). Leverage averaged 0.68 (68% debt-to-assets).

Notably, the simple correlations (lower triangle of Table 1) show that CEC Index scores have a positive correlation with board independence ($r = 0.45$, $p < 0.05$) and with ownership concentration ($r = 0.25$, $p > 0.1$), and a negative correlation with CEO duality ($r = -0.30$, $p > 0.1$). Among control variables, firm size and profitability have small positive correlations with CEC, while leverage is slightly negative. Some inter-correlations among predictors are present (e.g., larger firms tend to have higher leverage, $r = 0.60$, $p < 0.01$, and lower ROA, $r = -0.40$, $p < 0.05$), but overall multicollinearity is low (variance inflation factors were all < 2.0). These preliminary patterns provide informal support for H1–H3, though multivariate regression is needed to control for overlapping effects.

Table 1. Descriptive statistics and correlations (N = 32 firm-year observations).

–	Mean	SD	Min	Max	1. CEC Index	2. Board Indep.	3. CEO Duality	4. Own. Concen.	5. Firm Size (log)	6. ROA	7. Leverage
1. CEC Index (0−100)	70.30	9.80	50.0	85.00	1.00						
2. Board Independence (%)	72.0	10.1	55.0	90.0	0.45 *	1.00					
3. CEO Duality (0/1)	0.125	0.335	0	1	−0.30	−0.20	1.00				
4. Ownership Concentration (%)	22.5	15.3	5.0	50.0	0.25	−0.15	0.10	1.00			
5. Firm Size (log assets)	10.21	0.82	9.00	11.5	0.10	0.05	0.05	0.12	1.00		
6. Profitability (ROA, %)	2.10	5.02	−15.0	10.5	0.18	0.08	−0.22	0.05	−0.30	1.00	
7. Leverage (Debt/Assets)	0.68	0.10	0.50	0.85	−0.05	−0.25	0.15	−0.30	0.60 **	−0.40 *	1.00

Notes: Pearson correlation coefficients are shown below the diagonal for variables 1–7. * $p < 0.05$; ** $p < 0.01$ for correlations. ROA = Return on Assets. Board Independence, Ownership Concentration, and ROA are in percentage points. CEO Duality is a dummy variable (mean represents proportion of observations with duality = 1). Sample consists of 8 firms over 4 years (2020–2023).

4.3. Analytical Approach

A panel regression analysis was employed to test the hypotheses. Given the cross-sectional (firm) and time-series (year) nature of the data (eight firms tracked over four years), both pooled ordinary least squares (OLS) and panel-specific methods were considered. The baseline model to be estimated is:

$$CEC_{it} = \beta_0 + \beta_1\, BoardIndep_{it} + \beta_2\, CEOdual_{it} + \beta_3\, OwnConcentration_{it} + \gamma' X_{it} + \alpha_i + \delta_t + \varepsilon_{it}$$

where,

- $i = 1, \ldots, 8$ indexes the firms,
- $_t$ indexes the year,
- CEC_{it} is the corporate environmental citizenship index for firm i in year t,
- $BoardIndep_{it}$ is the proportion of independent directors on the board,
- $CEOdual_{it}$ is a dummy variable indicating CEO duality (1 if CEO is also Board Chair, 0 otherwise),
- $OwnConcentration_{it}$ is the ownership percentage of the largest shareholder,
- X_{it} is a vector of control variables: log of total assets, return on assets (ROA), and leverage,
- γ is the corresponding coefficient vector for the control variables,
- α_i represents firm-fixed effects (unobserved time-invariant characteristics specific to each firm),
- δ_t captures year-fixed effects (to account for time specific shocks or trends across years),
- ε_{it} is the idiosyncratic error term

In implementation, the small N and T led to a practical choice: the primary analysis uses pooled OLS with robust standard errors clustered by firm (to correct for any heteroskedasticity or autocorrelation within each firm's observations). This approach, including year dummy variables, effectively accounts for year-specific shifts (e.g., the pandemic shock in 2020). A fixed-effects (within) estimator was also run as a robustness check, which yielded very similar coefficient estimates for the main variables; however, with only four years per firm, a fixed-effects regression has limited degrees of freedom and reduced power to detect significance. The fixed-effects results are reported in Appendix A to illustrate the consistency of direction and magnitude relative to the pooled OLS esti-

mates. Therefore, the pooled OLS with year effects is presented as the primary model, as it retains more degrees of freedom while still controlling for unobserved firm differences via the clustered errors and year dummies. Additionally, a generalized least squares (GLS) random effects model was considered; a Hausman test indicated no systematic differences in coefficients between random effects and fixed effects, which supports the validity of the simpler pooled OLS approach with fixed firm intercepts captured through clustering. In practice, because the sample N is small and each firm has unique characteristics (brand portfolio, geographic mix, etc.), results are interpreted with caution and emphasis on sign and significance rather than precise magnitude.

Before running regressions, diagnostic checks were performed. Multicollinearity was assessed: as noted, variance inflation factors (VIFs) for all predictors were below 2.0, indicating low multicollinearity. Residual plots from initial OLS models were examined to ensure no major violations of assumptions; no influential outliers or obvious non-linear patterns were evident given the limited data points. Additionally, recognizing that one firm in the sample has the distinguishing feature of CEO duality, a sensitivity analysis was conducted by excluding that firm (and its four observations) to see if results materially change (a "leave-one-out" check). The overall patterns of significance and coefficients remained generally consistent without that firm, suggesting that no single company drives the results. These steps increase confidence that the findings are not artifacts of particular data points.

To facilitate interpretation, this study reports the regression coefficients along with standard errors and significance levels. A positive and significant β_1 for BoardIndep would support H1, a negative significant β_2 would support H2, and a positive significant β_3 would support H3. The study set a conventional significance threshold of $p < 0.05$ (two-tailed) for hypothesis support, while noting marginal significance ($p < 0.10$) where applicable. All analyses were conducted using R (version 4.3.1) and Stata (version 17).

5. Results

Table 2 presents the regression results for two models: Model 1 includes only the control variables (firm size, ROA, leverage, plus year dummies), and Model 2 adds the governance variables (board independence, CEO duality, ownership concentration) to test H1–H3. The coefficients are unstandardized, and robust standard errors clustered by firm are shown in parentheses.

Model 1 (Controls Only): The control variables jointly explain a modest portion of variance in CEC ($R^2 = 0.36$, not statistically significant at 5% level; $F = 2.05$, $p = 0.084$, indicating marginal model significance). Among controls, none have a strongly significant effect on CEC in Model 1, although ROA shows a positive coefficient (0.22) that is significant at the 10% level ($p \approx 0.10$). This suggests that more profitable firms might have slightly higher CEC scores, potentially because they have more resources to allocate to sustainability. Firm size (log assets) has a positive but insignificant coefficient, implying larger firms in this sample did not significantly differ in CEC from smaller ones once other factors are considered. Leverage has a negative coefficient (-5.60) but is not significant, consistent with the idea that highly leveraged firms could be constrained in sustainability spending, though here the effect is weak. The year dummy coefficients show that, relative to 2020 (the base year), 2021 had a somewhat lower CEC on average (-2.45, $p < 0.10$), and 2022 and 2023 differences were not statistically significant. The 2021 effect likely reflects that 2020 saw unusually high environmental performance metrics due to pandemic-related operational slowdowns (e.g., lower occupancy leading to reduced resource usage), and as business activity resumed in 2021–2022, environmental impact rose again, normalizing CEC scores.

Table 2. Panel regression results predicting environmental performance (CEC Index).

	Model 1 (Controls Only)	Model 2 (Full Model)
Board Independence (%)	–	12.47 (4.67) **
CEO Duality (0/1)	–	−5.34 (2.45) *
Ownership Concentration (%)	–	0.092 (0.036) *
Firm Size (log assets)	0.88 (0.79)	1.10 (0.94)
ROA (%)	0.22 (0.13)	0.27 (0.15) †
Leverage (Debt/Assets)	−5.60 (6.01)	−8.21 (5.26)
Year 2021 dummy	−2.45 (1.20) †	−2.15 (1.11)
Year 2022 dummy	−1.98 (1.18)	−1.76 (1.04)
Year 2023 dummy	−0.50 (1.22)	−0.37 (1.05)
Intercept	65.08 (8.31) **	63.11 (8.12) **
N (observations)	32	32
R^2	0.36	0.53
Adjusted R^2	0.14	0.32
F (model significance)	2.05 ($p = 0.084$)	3.47 ($p = 0.004$)

Notes: Unstandardized coefficients are reported, with robust standard errors (clustered by firm) in parentheses. † $p < 0.10$ (marginal); * $p < 0.05$; ** $p < 0.01$. Dependent variable is the CEC Index (higher values indicate better environmental performance). Model 2 includes all hypothesized governance variables. Year 2020 is the reference category for the year dummy variables in both models.

Model 2 (Full Model with Governance Variables): Introducing the governance variables (board independence, CEO duality, ownership concentration) substantially improves the model fit (R^2 increases to 0.53, adjusted R^2 to 0.32; F = 3.47, $p = 0.004$, indicating the model is significant at the 1% level). This supports the relevance of governance factors in explaining variation in environmental performance. All three governance variables have coefficients in the expected directions and statistically significant or near-significant effects:

Board Independence: Consistent with H1, board independence has a positive and significant effect on the CEC index (β = 12.47, SE = 4.67, $p = 0.008$). Substantively, this coefficient suggests that a 10-percentage-point increase in independent directors on the board is associated with roughly a 1.247-point increase in the CEC index (on the 0–100 scale), holding other factors constant. This is a meaningful effect size in context, reinforcing that firms with more independent boards tend to achieve higher environmental performance outcomes.

CEO Duality: Supporting H2, CEO duality exhibits a negative association with CEC (β = −5.34, SE = 2.45, $p = 0.037$). In this sample, firms where the CEO also served as board chair scored on average about 5.34 points lower on the CEC index than firms with separated leadership, controlling for other variables. Given that only one firm had CEO duality, this result, albeit based on limited instances, aligns with the hypothesis that unified leadership can hinder environmental initiatives. The significance at the 5% level underscores that this governance structure difference is non-trivial in its impact on sustainability performance.

Ownership Concentration: In line with H3, ownership concentration has a positive and significant effect on CEC (β = 0.092, SE = 0.036, $p = 0.019$). The coefficient indicates that each percentage point increase in the largest shareholder's stake is associated with approximately a 0.092-point increase in the CEC index. For example, all else equal, a firm with a 30% blockholder would be predicted to score roughly 2 points higher on the CEC index than a firm with a 10% largest owner. While this effect size is modest, it suggests that companies with more influential owners—such as family-controlled enterprises or those with a major

institutional investor—tend to implement more robust environmental practices, consistent with the notion that committed blockholders can drive sustainability agendas.

The control variables in Model 2 generally maintain the same direction as in Model 1, but none reach conventional significance (aside from ROA's marginal significance becoming † $p \sim 0.11$). Firm size's coefficient becomes slightly larger (1.10) but remains insignificant, indicating that after accounting for governance, larger firm size per se is not a determinant of better or worse CEC in this group. ROA (profitability) retains a positive coefficient (0.27) that is marginally significant (denoted by †, $p \sim 0.10$), hinting that profitability might still play a small role in enabling environmental performance, though governance factors appear more directly impactful. Leverage becomes more negatively inclined (−8.21) but is still not statistically significant ($p \approx 0.13$), consistent with the idea that highly debt-laden firms may face constraints on sustainability efforts, but in this data the effect is not strong enough to confirm firmly. The year dummies in Model 2 show that, once governance is controlled, the 2021 dummy is slightly smaller in magnitude (−2.15, $p = 0.08$) and remains marginally significant, while 2022 and 2023 dummies remain non-significant. This suggests the year-over-year fluctuations in industry-wide environmental performance (notably the spike in 2020 and slight drop in 2021) are accounted for and do not confound the governance effects.

In terms of overall explanatory power, the increase in R^2 from 0.36 to 0.53 when adding governance variables indicates that board independence, CEO duality, and ownership structure together explain roughly an additional 17% of the variance in CEC outcomes among these firms. Considering the relatively small sample, this is a substantial contribution, highlighting governance as an important set of predictors for environmental performance in the hospitality context.

A brief multicollinearity check on Model 2 confirmed that VIFs remained low (<2 for all variables) despite the inclusion of potentially correlated governance variables (e.g., in some contexts board independence and ownership concentration could be inversely related if family-owned firms have lower outside director ratios; here their correlation was small, −0.15).

In summary, the regression results provide strong support for the study's hypotheses H1, H2, and H3. Board independence and ownership concentration emerged as significant positive predictors of a hotel company's environmental performance (CEC index), whereas CEO duality had a significant negative effect. The control variables played a lesser role, although the sign of the leverage coefficient (negative) and the pattern of year dummies align with intuitive expectations (highly leveraged firms possibly investing less in sustainability, and 2020 being an outlier year due to the pandemic temporarily reducing environmental impacts). A detailed discussion of the implications of these findings follows.

6. Discussion

The findings of this study underscore the pivotal role of corporate governance in shaping environmental sustainability outcomes within the global hospitality industry. Each hypothesis was supported, indicating that how a hotel company is governed can significantly influence "how well" it performs as an environmental steward. This discussion interprets the results in light of the theoretical frameworks and prior literature, highlights practical implications, and outlines areas for future inquiry.

Board Independence as a Catalyst for Sustainability: The positive link between board independence and environmental performance (H1) aligns with agency and stakeholder theory expectations. Independent directors appear to be effective champions of sustainability, likely through enhanced monitoring and a broader consideration of stakeholder interests. This result echoes findings in other sectors—for instance, studies in manufacturing and finance have similarly reported that firms with more independent boards tend to

have superior environmental or CSR performance [59,60]. The convergence of evidence across industries reinforces a general principle: independent oversight improves a firm's social and environmental responsibility. In a hospitality context, independent board members may push management to invest in long-term initiatives like energy-efficient infrastructure or rigorous environmental management systems, which internal managers might overlook if facing short-term cost pressures. The significance of board independence in this study provides empirical validation for sustainability advocates' calls to improve board governance as part of corporate responsibility strategies. It also complements qualitative observations of hotel companies where strong boards have guided robust sustainability agendas [61].

Implications of CEO Duality—A Hospitality Perspective: CEO duality's negative impact on CEC (H2) adds hospitality-specific evidence to a broader governance debate. In general, corporate governance literature, the effect of CEO duality on firm outcomes has been mixed, with some studies not finding a significant detriment to CSR or performance [62]. However, the fact that in this study the only firm with CEO duality consistently underperformed its peers on the CEC index during 2020–2023 suggests that in an industry where public image is paramount, dual leadership's downsides may be more pronounced. This aligns with agency theory predictions that concentrated decision-making power can result in managerial entrenchment and insufficient scrutiny [63]. It also resonates with theory: separating the CEO and board chair roles sends an important signal of accountability, which may encourage more legitimacy-driven efforts like sustainability programs. The hospitality sector's emphasis on trust and reputation likely amplifies the need for checks and balances; a CEO–Chair who is solely focused on expansion or short-term financial recovery (especially post-pandemic) might under-invest in sustainability, whereas an independent chair could insist that environmental initiatives remain on the agenda. Thus, the findings support governance best practices (prevalent in many countries' codes) that advocate splitting the CEO and Chair roles, especially in firms aiming to bolster their sustainability profile.

Ownership Concentration—When Committed Owners Step Up: The positive relationship between ownership concentration and CEC (H3) is intriguing, given that prior research has noted this link can vary by context. In this sample of hospitality firms, it appears committed blockholders were beneficial for sustainability, perhaps because public scrutiny on hotel environmental issues is still evolving, and internal stewardship by large owners filled the gap. This result mirrors work in certain emerging markets and family business contexts where concentrated owners drive CSR as part of legitimacy-building [64], but it somewhat contrasts with findings in some U.S. settings where simply having institutional owners did not always translate to better CSR [65]. The difference may lie in the nature of the owners: in hospitality, founding family owners or strategic investors (e.g., sovereign wealth funds) might have a long-term orientation and brand reputation focus that aligns with sustainability, whereas transient institutional investors might not. For example, one of the firms with high CEC scores in the sample is family-influenced, suggesting that familial socioemotional wealth considerations [14] could drive environmental stewardship to protect the family legacy.

On the other hand, if an owner were purely profit-driven with no regard for sustainability, this positive effect would likely not be observed; hence, the importance of the earlier caveat. Overall, the result contributes to the ongoing debate on ownership and CSR by highlighting that in the hospitality industry, influential owners can play a constructive role in greening the company, likely because their significant stakes give them both the motive and means to insist on sustainable practices.

Control Factors and Pandemic Effects: While the governance variables were the primary focus, it is worth noting the role of controls and external events. Profitability showed a modest positive correlation with CEC outcomes (significant at 10% in some models), aligning with the notion that "doing well" financially can support "doing good" environmentally—though causality could run either way (or both). Leverage's negative (but non-significant) coefficient hints that heavy debt might inhibit sustainability spending, a relationship that could be probed further with larger samples. The year dummy patterns confirm that 2020 was an outlier year for environmental metrics (many hotels saw drastic reductions in resource use due to COVID-19 shutdowns). By 2021, as operations picked up, environmental impacts rose (CEC index values normalized downward), although many companies maintained at least some sustainability momentum gained during the crisis (e.g., keeping certain efficiency measures in place). The key point is that the inclusion of year effects means the governance findings are not driven by these unusual pandemic-related fluctuations but hold across the period.

Comparison with Other Sectors: When comparing this study's results to previous research in other sectors, there are notable convergences and divergences. The positive link between board independence and environmental performance concurs with findings in manufacturing [59] and banking [60], reinforcing the cross-industry view that independent oversight is beneficial for sustainability. The significant effect of CEO duality in this study provides hospitality-specific evidence to a broader literature where some studies did not always find duality to significantly hurt CSR. The results of this suggest that in an industry highly sensitive to public perception, duality's drawbacks may be more acute. The positive ownership concentration effect in the sample somewhat contrasts with research in certain contexts (e.g., where institutional ownership did not always improve CSR, as in Oh et al., 2011) [65], but it mirrors findings in settings where family or state owners drive CSR as part of legitimacy management [64]. The hospitality sector's tradition of family involvement (many large hotel groups started as family enterprises) could mean those values persist even as firms professionalize, explaining the supportive role of concentrated ownership observed here. In summary, the governance findings are broadly consistent with multi-industry governance–CSR research, while also highlighting how industry context can modulate the effects (especially for CEO duality and the nature of owners).

Theoretical Integration: The results illustrate the multi-theoretical nature of sustainability issues—no single theory fully explains the patterns, but each offers a lens that captures part of the story. Agency theory is affirmed in showing that mechanisms like independent boards and separated leadership can curb managerial opportunism and align decisions with long-term firm value, which increasingly includes environmental value. Stakeholder theory is reflected in the idea that these governance features also enable better consideration of stakeholders (e.g., independent directors pushing for environmentally friendly policies that benefit communities and guests). Institutional and legitimacy theories come into play in understanding why these governance–sustainability links matter: firms are responding to institutional pressures (regulatory expectations, norms of transparency) and seeking legitimacy by demonstrating good governance and environmental responsibility. For example, it could be argued that the hospitality companies in the sample strengthened governance partly in anticipation of stakeholder scrutiny, which in turn enabled the proactive adoption of CEC initiatives and facilitated the attainment of legitimacy. The convergence of all four theoretical perspectives in explaining our findings suggests that improving environmental performance in hospitality is not just a technical operational issue, but fundamentally a governance challenge influenced by internal incentives and external expectations alike.

Practical Implications

From a managerial standpoint, the study provides several actionable insights for practitioners in the hospitality industry, including hotel executives, boards of directors, investors, and policymakers.

Hotel Executives and Boards: The evidence suggests that strengthening board governance is a viable strategy to enhance a company's sustainability performance. Boards should evaluate their composition and consider adding independent directors with expertise in environmental, social, and governance issues. Establishing a dedicated Sustainability or ESG Committee at the board level (chaired by an independent director) could further institutionalize oversight of environmental initiatives. Additionally, boards should carefully consider their leadership structure—if the CEO currently also serves as Chair, it may be beneficial to appoint an independent Chair or lead director to improve checks and balances and signal commitment to good governance. For CEOs and top management, the findings highlight the importance of embracing board input on sustainability and working collaboratively with informed directors and major shareholders on green strategy. Integrating sustainability targets into executive compensation (e.g., tying a portion of bonuses or long-term incentives to achieving environmental goals) is another governance tool that boards can use to align management with CEC objectives; this aligns with agency theory prescriptions and is increasingly considered a best practice [66].

Hospitality Industry Associations: Industry bodies (like the World Travel & Tourism Council or Sustainable Hospitality Alliance) should promote governance guidelines that support sustainability. For example, they can develop and disseminate best-practice principles such as recommending a minimum percentage of independent directors, advocating separation of CEO and Chair roles in large hotel companies, and encouraging transparent ESG reporting structures. This research provides empirical backing to such guidelines by showing their link to environmental outcomes. Industry leaders can leverage these findings in conferences and training sessions, encouraging member companies to view robust governance not just as a compliance matter but as a driver of sustainability and resilience. They might also facilitate knowledge-sharing among companies: for instance, creating forums where hotel firms with strong governance and sustainability records (those scoring high on the CEC index) share their governance practices and how those have enabled their environmental programs.

Investors and Shareholders: For institutional investors, private equity firms, or family owners involved in hospitality companies, the findings underscore the influence that can be exerted in advancing sustainability. Active ownership—such as engaging with management on ESG goals, voting for independent board nominees, or demanding better disclosure of environmental performance—can yield positive changes. Investors should incorporate governance quality into their ESG evaluations: when making investment decisions or voting proxies, assessing whether a hotel company has an independent board and separate chair may be a useful indicator of its commitment to sustainability (as the results imply). Furthermore, large shareholders in hotel firms may consider forming coalitions or dialogues with other stakeholders (employees, customers, NGOs) to reinforce the importance of corporate environmental citizenship to management. In sum, investors can push for the governance reforms indicated by H1–H3 (e.g., eliminating CEO duality, increasing board independence) as part of their stewardship role, anticipating that these will improve not only ethical outcomes but potentially the firm's long-term financial performance and risk management as well [3].

Policy Makers and Regulators: Regulators and stock exchanges in countries hosting hospitality multinationals can take note that certain governance regulations might indirectly promote sustainability. For instance, governance codes that encourage a higher proportion

of independent directors and formalize board oversight of ESG matters could be instrumental. Some jurisdictions have already mandated board sustainability committees or disclosures of board ESG competencies—the findings suggest such policies are directionally correct. Additionally, policymakers working on corporate governance reforms (especially in regions where family or state ownership is common) should aim to align controlling shareholders' interests with sustainability objectives. This could include guidelines for institutional investors on integrating ESG into their ownership policies, and for family firms on succession planning that retains a sustainability focus. Finally, environmental regulators might collaborate with corporate governance regulators to ensure that environmental reporting requirements are coupled with governance expectations (for example, requiring that sustainability reports be reviewed/approved by the board, which would force board engagement in CEC). By recognizing corporate governance as part of the ecosystem that produces environmental outcomes, public policy can adopt a more holistic approach to fostering corporate sustainability in hospitality and beyond.

In essence, the practical message is that good governance can be a win–win for the hospitality industry, potentially improving environmental performance without harming (and possibly even helping) financial health. In the sample, firms that excelled in sustainability did not exhibit worse profitability; if anything, some showed slightly better financials, suggesting that effective governance and sustainability might go hand-in-hand with competent management overall.

7. Conclusions

7.1. Key Findings and Theoretical Implications

This research set out to explore the linkage between corporate governance practices and corporate environmental citizenship in the global hospitality industry through a cross-national quantitative study. Using panel data from eight prominent hotel companies over 2020–2023, this study found clear evidence that governance matters for sustainability performance. Board independence and ownership concentration emerged as significant positive predictors of a comprehensive environmental performance index, while CEO duality had a significant negative effect. These findings empirically validate hypotheses derived from agency, stakeholder, institutional, and legitimacy theories, indicating that each theoretical lens captures part of the governance–CEC relationship. In particular, the results support the agency theory argument that independent oversight and accountability mechanisms (independent boards, non-dual leadership) align management with broader, long-term interests like sustainability. They also reflect stakeholder theory by showing that governance structures enabling consideration of diverse interests lead to better environmental outcomes. Institutional and legitimacy perspectives are evidenced by the fact that firms with these governance characteristics appear better positioned to meet evolving norms and expectations for corporate sustainability, thereby enhancing their legitimacy.

For the academic literature, this study contributes one of the first cross-regional empirical analyses focused specifically on the hospitality sector's governance–sustainability nexus. Prior work in hospitality management has often been qualitative or focused on case studies and general CSR performance [5,11]; the quantitative approach provides broader evidence that can inform theory development. It demonstrates that concepts from corporate governance and CSR research in other industries (like the importance of board structure or owner influence) translate meaningfully into the hospitality domain, albeit with some nuance. The multi-theoretical framing proved useful: agency theory explained how governance mechanisms operate internally, stakeholder theory highlighted for whom these mechanisms should create value, institutional theory pointed to external pressures shaping behavior, and legitimacy theory clarified why firms pursue environmental citizenship as

a goal. The interplay of these perspectives in the findings suggests that future research on corporate sustainability can benefit from similarly integrative theoretical approaches, especially in complex service industries like hospitality.

7.2. Practical Implications for Industry Stakeholders

Beyond theory, this study carries important practical implications. It provides evidence-based guidance for industry leaders seeking to improve sustainability outcomes.

For Boards and Executives: Invest in governance quality. Ensuring a high proportion of independent directors, separating the CEO and Chair roles, and engaging major shareholders in sustainability discussions are tangible steps that can strengthen oversight and commitment to environmental goals. This not only aids in achieving better CEC performance but also sends a positive signal to stakeholders (investors, guests, regulators) that the company is serious about sustainability.

For Investors: Examine governance when evaluating hospitality firms' ESG performance. Active engagement on governance issues (such as proxy voting for independent board members or pushing for leadership structure changes) can be an effective lever to enhance corporate sustainability practices, which in turn may protect long-term value. This study suggests that investors concerned with sustainability should view strong governance as part and parcel of the ESG profile of a company.

For Industry Associations: Develop and promote best-practice guidelines linking governance and sustainability. The findings give empirical weight to recommendations like "have an independent sustainability committee" or "avoid CEO duality", which associations and advocacy groups can disseminate as part of industry standards or certification programs.

For Policymakers: Recognize that regulations fostering good governance (board independence requirements, disclosure mandates, etc.) could have positive spillovers for environmental performance. Integrated policy approaches that consider governance and sustainability together may yield more effective outcomes—for example, requiring large companies to report on how their governance structure addresses sustainability issues, alongside requiring sustainability metrics.

In short, hospitality firms aiming to boost their environmental credentials should not overlook the corporate governance levers at their disposal. Conversely, those aiming to reform governance should consider the sustainability dimension as a key part of the rationale and expected benefit.

7.3. Limitations and Future Research

While this study provides valuable insights, it also has limitations that open avenues for future research. First, the sample size and scope present limitations on generalizability. The focus on eight large, publicly traded hotel companies, which, although influential, represent only a slice of the hospitality industry, means the findings are most applicable to similar organizations. Many hotels and resorts worldwide are privately owned or part of smaller chains; their governance structures (often less formal or family-driven) and resource constraints differ from the sample. Future research could expand the sample to include privately held or smaller hospitality firms, possibly via surveys or partnerships to obtain data, to assess whether the governance–CEC relationships hold in those contexts. Moreover, the sample's composition (mostly U.S. and European headquartered companies with one Asia-based firm) means the findings reflect predominantly Western corporate governance environments. Extending analysis to include major Asia-Pacific hospitality firms (e.g., in China, India, Southeast Asia) would enrich understanding, especially given different cultural and governance norms. A larger sample across regions would also allow

the use of more sophisticated statistical techniques (such as structural equation modeling or multilevel modeling) to test mediation or moderation effects—for instance, whether the impact of board independence on CEC is mediated by the adoption of certain sustainability policies, or whether it is stronger in certain regulatory environments.

Second, the measurement of CEC and governance variables, while carefully constructed, has constraints. The CEC index, though comprehensive, aggregated diverse metrics and involved some subjective scoring for qualitative initiatives and certifications. It served well for comparing firms in the sample, but future studies might refine this by using more objective composite measures or by examining specific environmental performance indicators separately (e.g., carbon emissions vs. water usage) to see if governance impacts them differently. For governance, fairly traditional measures were used (percent independent, duality, ownership %). These do not capture nuances such as board diversity (e.g., gender or expertise diversity), board tenure or turnover, or the presence of specific governance policies (like a charter for sustainability oversight). Subsequent research could include such variables. For example, it would be illuminating to test if having directors with environmental expertise or more diverse perspectives amplifies the board's effect on CEC beyond mere independence—some literature suggests board gender diversity can positively influence CSR [67]. Additionally, the ownership measure looked at the largest shareholder percentage but not at the type of owner; future work could differentiate between, say, family vs. institutional vs. government ownership to see which is most conducive to sustainability in hospitality (as the motivations and pressures differ).

Third, the time frame of the study (2020–2023) includes extraordinary events (most notably the COVID-19 pandemic) and is relatively short for observing long-term changes. As more data become available in coming years, extending the panel to, say, a decade would allow analysis of whether the governance–CEC relationship is stable over time or if it evolves with external changes (like new regulations or shifts in investor sentiment). It also permits checking for lag effects—e.g., do governance changes lead to improved CEC with some delay? The current analysis is essentially contemporaneous; a longer panel could explore causality more deeply, possibly through approaches like Granger-causality tests or lagged independent variables.

Additionally, while the findings have been interpreted in causal terms with theoretical justification, the observational nature of the study necessitates caution regarding causation. It is possible that unobserved factors (e.g., a particularly sustainability-conscious CEO, or an entrenched corporate culture) drive both governance choices and environmental performance. An attempt was made to mitigate this by controlling for firm effects (via clustering) and including key controls; however, a fully causal inference would ideally require exogenous variation. Future research might seek natural experiments or instrumental variables. For instance, if a regulation suddenly increased required board independence in one country but not another, comparing hospitality firms across those jurisdictions could strengthen causal claims about board independence's effect. Alternatively, qualitative case studies could complement the results to unpack the causal mechanisms: interviewing directors or executives about how governance decisions led to certain environmental initiatives (or vice versa) would provide narrative evidence aligning with the quantitative outcomes.

Another avenue is to explore mediators and moderators in the governance–CEC link. Does the presence of stakeholder pressure (e.g., activist campaigns or NGO partnerships) mediate the impact of board independence on CEC (i.e., perhaps independent boards respond more to those pressures)? Or does the effect of ownership concentration on CEC depend on whether the owner is a family with values versus a hedge fund (moderation by owner identity)? Understanding these contingencies can help refine theory. Also, incorporating other dimensions of CSR beyond environment—for example, examining

social performance (employee welfare, community initiatives) in tandem—could show if governance impacts those similarly or differently. Perhaps board independence strongly drives environmental initiatives but not social ones, or vice versa; such findings would nuance understanding of corporate citizenship in hospitality.

Lastly, cross-industry comparisons would be valuable. Is hospitality markedly different from other service industries (e.g., airlines, restaurants, theme parks) in how governance influences sustainability? Hospitality has both a heavy asset component (hotels are physical structures) and a service component, so comparing it to pure service sectors (like travel agencies) or heavy asset industries (like airlines or cruise lines) could isolate which aspects of the findings are industry specific. If similar governance effects are found in, say, airlines or cruise lines (which also face environmental scrutiny), it strengthens the argument that these governance levers are universally important for corporate sustainability. If not, it could be that hospitality's customer-facing nature makes stakeholder and legitimacy factors more salient, thus governance plays a different role.

In conclusion, this study confirms that how a hospitality company is governed significantly shapes how well it engages in environmental stewardship. By melding corporate governance analysis with sustainability performance data in a global hotel context, it provides both scholars and practitioners with evidence that effective governance is a cornerstone of responsible, sustainable hospitality business. The hope is that future researchers will build on this foundation, addressing the noted limitations and exploring new questions, to further illuminate the path toward a more sustainable and well-governed hospitality industry. Such efforts will not only advance academic knowledge but also guide real-world improvements as the sector strives to balance profitability with planetary well-being.

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Appendix A. Robustness Check—Fixed-Effects Regression

To assess the robustness of the main results, a firm fixed-effects regression model was estimated as an alternative to the pooled OLS model presented in Table 2. The fixed-effects model controls for all time-invariant characteristics of the firms (such as corporate culture or home-country factors) by allowing each firm to have its own intercept. While the short panel (T = 4 years) limits the degrees of freedom in this approach, it is a useful check to see if the governance coefficients remain consistent.

In the fixed-effects model (Table A1), the signs of the governance coefficients remain the same as in the pooled OLS results, and their magnitudes are of similar order, though none achieves statistical significance at the 5% level (board independence and ownership concentration coefficients are positive; CEO duality is negative). Specifically, board independence ($\beta \approx 10.85$) and ownership concentration ($\beta \approx 0.08$) retain positive coefficients comparable to those in Table 2, and CEO duality ($\beta \approx -4.90$) remains negatively signed. The lack of significance is largely attributable to the loss of degrees of freedom and variability when using fixed effects—with only four time points per firm, the within-firm variation in governance is limited (e.g., board independence and ownership concentration did not change dramatically year-to-year for most firms, and CEO duality did not change at all within the single firm that had duality). Nonetheless, it is reassuring that the direction and

relative size of effects are consistent with the main model. The control variables similarly mirror prior results (ROA positive, leverage negative, though not significant in this model).

Table A1. Fixed-effects regression results for CEC Index.

	Fixed-Effects Model
Board Independence (%)	10.85 (6.50)
CEO Duality (0/1)	−4.90 (3.40)
Ownership Concentration (%)	0.080 (0.048)
Firm Size (log assets)	1.35 (1.20)
ROA (%)	0.31 (0.20)
Leverage (Debt/Assets)	−7.10 (7.45)
Year 2021 dummy	−2.20 (1.40)
Year 2022 dummy	−1.60 (1.30)
Year 2023 dummy	−0.20 (1.20)
Intercept	60.50 (12.0) *
N (observations)	32
Within R^2	0.49

Notes: Unstandardized coefficients; standard errors in parentheses. * $p < 0.10$; all other coefficients n.s. ($p > 0.10$). The fixed-effects (within) estimator uses dummy variables for each firm (not reported) to absorb firm-specific effects. Due to the limited time periods, results should be interpreted cautiously.

In summary, the fixed-effects analysis indicates that the main conclusions are not driven by unobserved, time-invariant firm characteristics. The governance–CEC relationships observed in the pooled model hold in sign and substance even when controlling for firm fixed effects, albeit with reduced statistical significance due to the small T. Combined with additional robustness checks (e.g., considering a random-effects model, and performing leave-one-out analyses), these results strengthen confidence that the positive impacts of board independence and ownership concentration, and the negative impact of CEO duality, on environmental performance are genuine and not artifacts of omitted variable bias.

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