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CEO POWER CHARACTERISTICS AND ENVIRONMENTAL DISCLOSURE

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ABSTRACT

This study aimed to analyze the relationship between CEO power and environmental disclosure among publicly listed Brazilian companies on B3 from 2010 to 2022. Using data from 215 firms (1,453 observations), CEO power was measured across three dimensions: structural, ownership, and prestige. Environmental disclosure was assessed through eight environmental indicators related to the corporate sustainability agenda, aligned with the United Nations Sustainable Development Goals (SDGs), encompassing environmental, social, and governance aspects. The analyzed indicators included factors such as carbon emissions, water consumption, waste management, and the use of renewable energy. The findings indicated that only CEO prestige power has a positive and significant relationship with environmental disclosure, highlighting the importance of public recognition of corporate leaders. In contrast, structural and ownership power were not statistically significant. Therefore, this study contributes to the literature by exploring the relationship between CEO characteristics and sustainability practices in an emerging market, providing insights for companies, investors, and policymakers interested in broadly aligningcorporate strategies with the SDG principles.

Keywords: Environmental Disclosure. Brazilian Companies. SDGs. CEO Power. Sustainability.

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1 INTRODUÇÃO

In recent years, corporate environmental disclosures have gained increasing prominence in scientific research, driven by adverse climate change and growing pressure from various stakeholders, including customers, investors, managers, and regulatory bodies (Arslan et al., 2022). Such disclosures represent a way for companies to legitimize their operations in the eyes of society, demonstrating a commitment to sustainable practices (Dagiliene et al., 2020; Nuber & Velte, 2021). Moreover, many companies seek these disclosures as a means of gaining stakeholder trust (Oware & Awunyo-Vitor, 2021). As organizational leaders, Chief Executive Officers (CEOs) play a key role in orchestrating resources to meet diverse objectives and pressures (Walls & Berrone, 2017), with their individual characteristics and perceptions influencing the direction of corporate actions (Resick et al., 2023). The growing attention to CEOs in academia, politics, and the media, focusing on their traits and impacts, reflects the importance of these individuals in social and environmental issues (Lu et al., 2022).

The Upper Echelons Theory (UET), proposed by Hambrick and Mason (1984), argues that the characteristics of top executives strongly influence strategic decisions within companies. According to Finkelstein (1992), CEO power is a fundamental factor in ensuring organizational continuity and can be divided into four dimensions: structural power, ownership power, expert power, and prestige power. Oware and Awunyo-Vitor (2021) emphasize that understanding the role of the CEO and their characteristics is essential for aligning companies with the global sustainable development agenda and highlight the need for further research connecting CEO traits to environmental disclosure. This gap is particularly notable in developing countries, where the link between CEO characteristics and environmental sustainability, especially regarding the United Nations Sustainable Development Goals (SDGs), remains underexplored.

The role of CEOs in mitigating negative environmental impacts and addressing climate change is increasingly vital, as external pressures from regulators, investors, and environmental organizations demand corporate reforms in this direction (Al-Shaer et al., 2022). The literature also emphasizes that environmental sustainability has become an increasingly important priority for organizations, highlighting the need for business leaders to adapt their strategies to combat environmental degradation (Mahran & Elamer, 2024). However, despite the growing relevance of sustainability in organizational strategies, the literature still presents a significant gap in studies investigating how CEO characteristics relate to environmental disclosure, particularly in emerging countries such as Brazil.

According to Li et al. (2018), greater CEO power can strengthen the relationship between environmental disclosure and firm value, as stakeholders tend to perceive disclosures from companies led by more influential CEOs as a stronger commitment to environmental practices. This point is particularly relevant for developing countries, where aligning companies with sustainable practices is crucial not only to ensure their competitiveness but also to contribute to the global sustainable development agenda. Oware and Awunyo-Vitor (2021) also note the scarcity of studies in developing countries, observing that most literature on the subject focuses on the CEO duality regarding environmental disclosure, with few studies exploring demographic characteristics such as gender, ownership, and CEO power.

Neglecting these aspects may underestimate environmental disclosure risks, potentially harming the company (Liu & Nguyen, 2020). In this context, Theissen and Theissen (2020) highlight the low interest in studying CEO characteristics and their implications for environmental disclosure. According to Oware and Awunyo-Vitor (2021), it is difficult to establish a clear conclusion about the association between CEO characteristics and environmental disclosure. Mahran and Elamer (2024), in a literature review, identified an increase in research on CEOs and environmental sustainability in recent years, with 15 articles published in 2019, 14 in 2020, 33 in 2021, and 48 in 2022. This growth may be related to the rising concern about environmental

degradation and climate change, which likely drives both academic and professional interest in sustainable solutions.

Given the gap in the literature, which does not reach a clear conclusion regarding the relationship between CEO characteristics and environmental disclosure, the following question arises: What is the relationship between CEO power and environmental disclosure among Brazilian companies listed on B3? Therefore, this study aims to analyze the relationship between CEO power and environmental disclosure in publicly listed Brazilian companies on B3 from 2010 to 2022. This study is justified by the significant gap in the literature, especially concerning the connection between CEO characteristics and environmental sustainability, with a focus on the United Nations Sustainable Development Goals (SDGs) and the relationship between CEO power and environmental disclosure in emerging countries such as Brazil. The research also aligns with the global sustainability agenda by measuring environmental disclosure based on the UN SDGs, providing contributions for both academics and practitioners, as well as policymakers interested in understanding how corporate leaders can promote sustainable practices within companies.

2 THEORETICAL FRAMEWORK

2.1 Environmental Disclosure

In response to the growing environmental challenges and increasing public awareness regarding environmental protection, governments worldwide are emphasizing corporate environmental disclosure (Pizzetti et al., 2021). The goal is to promote corporate environmental initiatives through transparent reporting that provides users with reliable information (Shahab et al., 2019). Zhou et al. (2024) highlight that this global trend toward environmental protection has led companies to proactively engage in environmental protection actions and voluntarily disclose environmental information. Pinheiro et al. (2022) emphasize that environmental disclosure not only meets stakeholder expectations but also seeks to contribute to societal well-being.

Amorim et al. (2021) argue that companies, in order to respond to pressures arising from the increasing ecological awareness of governments, society, and managers, are incorporating environmental issues into their strategies. They use accountability to report their actions regarding environmental matters (Ribeiro et al., 2011) as a way to legitimize their activities and reinforce a commitment to sustainable development (Pinheiro et al., 2023a). Reports ensure transparency, demonstrate the firm's responsibility toward society, provide environmental benefits for the population and the environment, and allow companies to communicate their own narrative (Pinheiro et al., 2022).

Thus, when a company demonstrates care for sustainability, policies and strategies are structured to align the company's objectives with the 2030 Agenda, seeking to contribute to the United Nations Sustainable Development Goals (SDGs) (Nishitani et al., 2021). Supporting this, Sullivan et al. (2018) highlight that by internalizing SDG-related issues into their actions, companies need to modify their business models to emphasize the sustainability agenda.

2.2 Upper Echelons Theory and CEO Power

The influence of the CEO on the development and continuity of an organization is grounded in the Upper Echelons Theory (UET), as proposed by Hambrick and Mason (1984). This theory suggests that managers' personal characteristics can be used to predict organizational outcomes. According to UET, executives' strategic interpretations are shaped by their cognitive bases and values, meaning that these leaders' knowledge, skills, and information-processing abilities impact their decisions and, consequently, the organization's performance. Bouaziz et al. (2020) argue that, according to this theory, the characteristics and experiences of the CEO significantly affect decision-making and organizational outcomes.

Hambrick and Mason (1984) state that the theory assumes that CEOs, due to their particular characteristics and skills, have the capacity to influence value creation within the firm, in addition to strategic choices and decisions related to financial reporting. In a literature review conducted by Mahran and Elamer (2024), it was observed that 25% of studies on CEOs and environmental sustainability justified their research based on Upper Echelons Theory. Agency theory also supports this view, arguing that as CEO power increases, the board's ability to effectively manage agency conflicts decreases (Fama & Jensen, 1983).

Finkelstein (1992) defined power as an individual's ability to exercise their will over something. To understand a manager's influence within a company, it is necessary to characterize that manager according to the power they hold. Finkelstein (1992) recognized the multidimensional nature of power, highlighting four main dimensions: structural power, ownership power, expert power, and prestige power. These dimensions allow for the assessment of the type of influence a manager can exert over the organization and provide metrics for each. However, as discussed by Khuong et al. (2024), some of these dimensions may have distinct effects on corporate governance and transparency.

2.3 CEO Power and Environmental Disclosure

Institutions, including stakeholders, pressure companies to disclose their environmental performance, addressing how they use natural resources and the impact of their operations. This pressure aligns with the United Nations Sustainable Development Goals (SDGs). According to Dagiliene et al. (2020), environmental impact is mitigated through disclosures aimed at reducing negative effects, such as investments in energy efficiency and pollution prevention. Adams et al. (2005) argue that top management support is a key internal factor for environmental disclosure, and that CEOs, as primary decision-makers, play a significant role in this process. Li et al. (2018) add that powerful CEOs have a stronger motivation to regulate environmental disclosure practices, aiming to demonstrate their commitment to stakeholder concerns.

The Brazilian literature also reinforces this relationship. The study by Mota and Pimentel (2022) analyzed companies listed on B3 and demonstrated a positive correlation between environmental performance and disclosure. Similarly, Rigon et al. (2023) showed that institutional factors affect ESG disclosure in Brazil, indicating that country-specific characteristics influence corporate transparency.

Structural power, according to Finkelstein (1992), is the fundamental dimension of power within the organizational structure, determined by the hierarchy of the organization. This type of power is granted to the CEO by their organizational position, making it superior to that of other executives. Adams et al. (2005) indicate that this power is associated with the CEO's influence over the company's board and other top executives, due to their positions or titles, such as founder or board member. Thus, when the CEO holds both the Chair of the Board of Directors (BoD) and the executive management positions, they possess structural power. However, Oware and Awunyo-Vitor (2021) point out that the CEO's dual role can result in additional responsibilities, potentially negatively affecting decisions regarding environmental disclosure. The study by Khuong et al. (2024) further reinforces that more powerful CEOs may reduce transparency in ESG matters when it does not generate direct benefits for the company.

In light of this, the following research hypothesis is proposed:

Hypothesis 1: CEO structural power is negatively related to environmental disclosure.

Ownership power, according to Finkelstein (1992), refers to the CEO's influence in the alignment between shareholders and management, depending on the amount of shares held by the CEO. CEOs who own a significant portion of shares tend to align their interests with those of the shareholders (Meckling & Jensen, 1976). However, Al-Ahdal et al. (2023) point out that

shareholder-CEOs may have a longer investment horizon and, therefore, may be more inclined to adopt ESG practices to mitigate institutional and regulatory risks.

In light of this, the second research hypothesis is proposed:

Hypothesis 2: CEO ownership power is positively related to environmental disclosure.

A CEO's prestige power is defined by the external recognition of their skills and achievements. CEOs with high prestige generally disclose more information to maintain transparency and credibility. Yin et al. (2023) suggest that after receiving awards, CEOs tend to intensify their Corporate Social Responsibility (CSR) initiatives, taking into account the benefits and demands of stakeholders. Cheng (2023) investigated the impact of award-winning CEOs on CSR performance and found that companies led by awarded CEOs tend to achieve better outcomes.

In the present study, awards from Forbes magazine and the Valor Econômico newspaper for top CEOs are analyzed. However, it is important to note that these awards are not exclusively environmental. The study by Khuong et al. (2024) suggests that a CEO's reputation can influence their choices regarding corporate transparencY.

Accordingly, the third and final research hypothesis is proposed:

Hypothesis 3: CEO prestige power is positively related to environmental disclosure.

CEO power is a crucial factor in corporate decisions related to environmental activities. However, it is important to note that the motivation to adopt beneficial environmental practices can also be opportunistic, as such actions may enhance the CEO's image and reputation (Li et al., 2018). This aligns with Agency Theory, as proposed by Meckling and Jensen (1976), which suggests that the agency conflict between agent and principal can lead managers to make decisions that serve their personal interests at the expense of shareholders' interests. Thus, a powerful CEO may pursue projects that enhance their public image as an environmental advocate, even if these initiatives do not provide direct benefits to shareholders.

3 METHODOLOGICAL PROCEDURES

3.1 Data

The population of this study comprises non-financial publicly traded companies listed on Brasil, Bolsa, Balcão (B3), covering the period from 2010 to 2022. The starting point of 2010 is justified by the mandatory implementation of the International Financial Reporting Standards (IFRS) in Brazil, which brought significant changes to the accounting methods used by companies. Furthermore, from this year onward, the disclosure of detailed information about executives became mandatory through the Reference Form (Formulário de Referência, FR). The year 2022 was chosen as the end of the time series because it is the most recent year for which all necessary information on environmental disclosure is available.

To ensure the consistency of the analyzed data, filters were applied in the sample selection. Companies without available information on the CEO in the Reference Form (FR) or without complete environmental disclosure data in the Refinitiv Eikon® database were excluded from the study.

The choice of the FR as the primary data source is justified by the mandatory nature and standardization of the information provided, allowing for greater comparability across companies. However, this is recognized as a limitation of the study, as environmental disclosure may also be present in other corporate reports, such as Annual Reports, Sustainability Reports, Integrated Reports, and Social Balance Sheets.

Additionally, the measurement of environmental disclosure adopted in this study is aligned with the UNCTAD/UN (2019) Basic SDG Indicators. This document provides a structured set of internationally recognized metrics to assess the environmental impact of companies. Its use contributes to the standardization of data collection and allows broader comparisons across different corporate and regulatory contexts. Alignment with these indicators strengthens the validity of the results and the relevance of the analysis within the scope of corporate sustainability.

After applying the filters, the final sample comprises 215 companies, resulting in 1,453 observations over the analyzed period. The relatively small number of companies is due to the unavailability of some key information in certain firms, particularly in earlier years.

The data were organized as an unbalanced panel since some companies did not provide complete information for all years in the analyzed period. This format minimizes the loss of observations and allows the inclusion of all companies with available data for at least part of the studied interval.

Data modeling was performed using Stata®, employing analytical techniques such as descriptive statistics, correlation analysis, and panel data regression, enabling a detailed assessment of the collected data.

3.2 Measurement of Environmental Disclosure

The dependent variable of this study, named DIV (environmental disclosure), was constructed by summing the eight environmental indicators presented in Table 1, organized into four central pillars: water, energy, emissions, and waste. Each of these pillars encompasses fundamental aspects of corporate environmental management and reflects practices that have a direct impact on the environment. The indicators were selected based on their international relevance and are recognized as essential criteria for assessing companies' contributions to achieving the Sustainable Development Goals (SDGs), as established by the United Nations. Table 1 presents the specific descriptions of each of these indicators.

Table 1
Checklist of the Dependent Variable – Environmental Disclosure

Pillar	Indicator	Refinitiv Indicator
Water	Water recycling and reuse.	*Water Recycled*
	Water use efficiency.	*Targets Water Efficiency*
Energy	Energy efficiency.	*Energy Efficiency*
	Renewable energy.	*Renewable Energy*
Emissions	Total emissions.	*Emissions Score*
Waste	Hazardous waste.	*Hazardous Waste*
	Ozone-depleting substances and chemicals.	*Ozone-Depleting Substances*
	Waste reduction / Reused, remanufactured, and recycled waste	*Waste Recycled Total*

Source: Prepared by the authors based on the UNCTAD/UN SDG basic indicators (2019).

In the case of the dependent variable DIV, the scoring criterion is based on the disclosure of indicators by the companies. One point is assigned for each environmental indicator disclosed by the company. If a company does not disclose a particular indicator, it receives a score of zero for that specific item. Thus, the variable DIV corresponds to the sum of the scores obtained for each evaluated indicator. In summary, the more information a company discloses regarding the environmental indicators, the higher its total score for the variable, reflecting the level of

transparency concerning environmental issues. Therefore, its minimum value is 0 (no disclosure) and its maximum value is 8 (full disclosure of all indicators).

3.3 Model Specification

Table 2 presents in detail the independent variables related to CEO power, as well as the CEO and firm control variables that will be used throughout the study. In addition, the table includes the corresponding metrics adopted to measure each variable and cites the authors who support the use of these variables and metrics.

Table 2
Research Variables

Variable	Metric	Expected Relationship	Theoretical Foundation
	Independent Variables		
Structural Power (Power_Est)	Dummy variable, taking the value of 1 when the CEO is also the Chairman of the Board of Directors (BoD) and 0 otherwise.	(-)	Abdul Majid et al. (2023) ; Al-Shaer et al. (2022); Côrrea et al. (2024); Finkesltein (1992); Hamidah e Arisukma (2020); Oware e Awunyo-Vitor (2021); Pereira da Silva et al. (2024).
Ownership Power (Power_Prop)	Dummy variable, taking the value of 1 when the CEO is among the top 5 shareholders of the company and 0 otherwise.	(+)	Abdul Majid et al. (2023); Côrrea et al. (2024); Finkesltein (1992); Lisic et al. (2016); Muttakin et al. (2018); Veprauskaite e Adams (2013); Wukich (2020).
Prestige Power (Power_Prest)	Dummy variable, taking the value of 1 when the CEO has received at least one of the awards ("Best CEO in Brazil" by Forbes Magazine and "CEO de Valor" by Valor Econômico Newspaper) and 0 otherwise.	(+)	Côrrea et al. (2024); Finkesltein (1992); Muttakin et al. (2018); Wukich (2020); Yin et al. (2023).
	Control Variables		
CEO age (Ida)	CEO Age (in years).	(+)	Abreu et al. (2024); Al-Shaer et al. (2022); Haider et al. (2019); Oware e Awunyo-Vitor (2021); Pereira da Silva et al. (2024).
Gender (Gen)	Gender (dummy variable: 1 if the CEO is male, 0 if female).	(+)	Abreu et al. (2024); Al-Shaer et al. (2022); Pereira da Silva et al. (2024); Yin et al. (2023).
Size (Tam)	*Ln* (Total Assets)	(+)	Abreu et al. (2024); Al-Shaer et al. (2022); Côrrea et al. (2024); Hamidah e Arisukma (2020); Oware e Awunyo-Vitor (2021); Pereira da Silva et al. (2024).
Return on Assets (ROA)	Operating Income / Total Assets	(+)	Abreu et al. (2024); Al-Shaer et al. (2022); Côrrea et al. (2024); Muttakin et al. (2018); Wukich (2020).
Firm Age (Ide)	Number of years since the company's founding.	(+)	Hamidah e Arisukma (2020); Muttakin et al. (2018).

Source: Prepared by the authors (2024).

To examine the proposed relationship, the ordinary least squares (OLS) regression model was applied, as described in Equation 1. The choice of this econometric model was based on specification tests (Chow, Breusch-Pagan, and Hausman) conducted at a 5% significance level, which indicated a preference for using OLS. The data were organized in an unbalanced panel to minimize the loss of observations. After selecting the most appropriate model, Shapiro-Wilk and Breusch-Pagan tests were performed to assess the normality of the residuals and the

homoscedasticity of the variables. In addition, the variance inflation factor (VIF) was used to analyze multicollinearity among the independent variables in the regression model. The average VIF obtained was 1.07, indicating no multicollinearity among the study variables. To address potential heteroscedasticity issues, a regression with random effects and robust standard errors was conducted to ensure the robustness of the model's statistical inference.

Despite the high frequency of zero values in the dependent variable, additional tests were carried out to verify the suitability of the linear regression. The heteroscedasticity test (Breusch-Pagan) was conducted to ensure the robustness of the results, and the residuals were analyzed for normality. Alternatively, future studies could consider approaches such as Tobit regression or binary models to explore different ways of measuring environmental disclosure.

$$DIV = \alpha + b_1 POWER\_est + b_2 POWER\_prop + b_3 POWER\_prest + b_4 IDA + b_5 GEN + b_6 TAM + b_7 ROA + b_8 IDE + \varepsilon$$

(Equation 1)

Where: *DIV* = Environmental disclosure; *POWER_est* = Structural power; *POWER_prop* = Ownership power; *POWER_prest* = Prestige power; *IDA* = CEO age; *GEN* = CEO gender; *TAM* = Firm size; *ROA* = Profitability; *IDE* = Firm age.

The sector variable was not included as a control in this study because the environmental disclosure metric adopted is based on the transparency of the information provided by companies, regardless of their sector of activity. Since the focus of the analysis is on the decision to disclose or not disclose environmental indicators, rather than on the specific environmental impacts of each sector, including this variable could generate redundancy. Moreover, the model indirectly controls for potential sectoral effects through variables such as firm size (Ln Total Assets) and profitability (ROA), which reflect structural characteristics that may vary across sectors. Additionally, the use of firm fixed effects captures structural differences that could be attributed to the sector, minimizing the need for a specific sectoral variable.

The CEO gender variable was included to assess the influence of female leadership on environmental disclosure. Studies suggest that women in top positions tend to adopt practices more aligned with sustainability and corporate transparency. Although the number of female CEOs is still low, including this variable allows testing whether gender diversity has a significant effect on environmental disclosure.

Return on assets (ROA) was included as a control variable to capture the relationship between financial performance and environmental disclosure. The expected positive sign is based on the premise that more profitable companies have greater financial capacity to invest in environmental initiatives and improve their reporting systems, thereby increasing transparency. In addition, financially healthy companies may face greater stakeholder pressure to disclose their ESG practices. Thus, the influence of ROA on environmental disclosure will be analyzed empirically.

Firm age was included as a control variable due to its potential impact on environmental disclosure. The expected positive sign is based on the premise that older firms have greater institutional experience, better governance structures, and have been subject to environmental regulations for a longer period, all of which may encourage greater transparency. Furthermore, established companies may face more stakeholder demands to disclose sustainable practices. However, younger firms may be more aligned with new ESG requirements from their inception. Given these possibilities, the relationship between firm age and environmental disclosure will be empirically examined.

4 PRESENTATION AND ANALYSIS OF RESULTS

4.1Descriptive Statistics and Correlation

Table 3 presents the descriptive statistics of the data observed in the study, including means, medians, standard deviations, minimums, and maximums. The results indicate that the mean of DIV is 0.702, suggesting a low average level of environmental disclosure. The median, equal to 0, reinforces that at least 50% of the companies in the sample do not disclose any of the environmental indicators analyzed. This finding reflects a challenging scenario for environmental transparency in Brazil, as most companies do not report sustainability-related information according to the criteria considered in this study.

Table 3
Descriptive Statistics of the Study.

Variables	Mean	Median	Standard Deviation	Minimum	Maximum
DIV	0.702	0	1.584	0	8
Power_EST	0.101	0	0.301	0	1
Power _PROP	0.35	0	0.477	0	1
Power _PREST	0.072	0	0.259	0	1
Ida	52.521	53	9.745	27	91
Gen	0.962	1	0.19	0	1
Tam	21.501	21.65	2.106	6.503	27.618
ROA	-0.038	0.041	2.071	-117.7	7.347
Ide	37.643	31	28.79	0	150

Note. DIV = Environmental Disclosure; Power_EST = Structural Power; Power_PROP = Ownership Power; Power_PREST = Prestige Power; Ida = CEO Age; Gen = CEO Gender; Tam = Firm Size; ROA = Return on Assets; Ide = Firm Age.
Source: Research data (2024).

The descriptive analysis of the variable DIV indicates that the median is zero, meaning that at least 50% of the companies in the sample do not disclose any environmental information. Furthermore, approximately 20% of the companies disclose between one and two environmental indicators, while around 30% disclose three or more indicators.

The analysis of CEO-related variables shows that 10.1% of the companies have CEOs who also serve as chairman of the Board of Directors (Power_EST), while 35% of CEOs are among the five main shareholders (Power_PROP). Additionally, only 7.2% of CEOs have received prestige awards (Power_PREST), indicating a limited number of business leaders with significant public recognition.

The average age of CEOs in the sample is 52.5 years, with the youngest being 27 and the oldest 91, a result similar to that reported by Al-Shaer et al. (2022), who found an average CEO age of 52 years. Oware and Awunyo-Vitor (2021) found an average age of 54.4 years among CEOs in India. Regarding gender, the sample is predominantly male, with 96.2% of CEOs identified as male (Gen), reflecting a low level of gender diversity in the leadership of the companies analyzed.

The average company size in the sample was 21,501. The observed range (minimum 6,503 and maximum 27,618) indicates that the sample includes companies of different sizes, from smaller firms to large corporations. The average ROA of the sample was -0.038, with a median of 0.041, indicating that while some companies report positive profitability, a significant portion faces financial difficulties, reflected in negative ROA values.

Regarding the companies' age, there are firms with less than one year of operation and others up to 150 years old, with an average age of 37 years. In comparison, Muttakin et al. (2018) reported an average company age of 24 years, while Wukich (2020) found an average of 13.64 years.

Table 4
Spearman correlation coefficients

Variables	DIV	Power_Est	Power_Prop	Power_Prest	Ida	Gen	Tam	ROA	Ide
DIV	1.000								
Power_Est	-0.138	1.000							
Power_Prop	-0.147	0.212	1.000						
Power_Prest	0.278	-0.033	0.002	1.000					
Ida	-0.048	0.078	0.112	-0.027	1.000				
Gen	0.035	-0.090	0.056	0.034	0.116	1.000			
Tam	0.592	-0.182	-0.183	0.225	-0.333	-0.021	1.000		
ROA	0.085	-0.040	0.021	0.140	0.018	-0.044	0.029	1.000	
Ide	-0.021	0.156	-0.046	0.029	0.052	-0.014	-0.060	0.062	1.000

Note. DIV = Environmental Disclosure; Power_EST = Structural Power; Power_PROP = Ownership Power; Power_PREST = Prestige Power; Ida = CEO Age; Gen = CEO Gender; Tam = Firm Size; ROA = Return on Assets; Ide = Firm Age.
Source: Research data (2024).

Table 4 presents the correlation coefficients among the variables, which indicate the linear relationships between them. It can be observed that firm size (Tam) exhibits the strongest positive correlation with environmental disclosure (DIV), suggesting that larger companies tend to disclose more environmental information, corroborating findings from other markets, such as Oware & Awunyo-Vitor (2021). Other variables, such as Power_Prest and ROA, also show positive correlations, although weaker. Conversely, variables such as Power_Est, Power_Prop, CEO age, and firm age display weak negative correlations with DIV, indicating that these factors have little or a negative relationship with environmental disclosure. Consistent with these results, Wukich (2020) observed a negative correlation between CEO power (measured in four ways) and all environmental disclosure characteristics examined in his study.

4.2 Regression Results

Table 5 presents a detailed estimation of the regression model used to analyze the impact of CEO power on environmental disclosure. CEO power was measured through three dimensions: structural power, ownership power, and prestige power. The model allows for an understanding of how each of these forms of power relates to the organization's environmental disclosure practices. It is noteworthy that the model exhibits an explanatory power of 34.43% (adjusted R^2), indicating that a significant portion of the variability in environmental disclosure levels can be explained by the variables selected in the study.

Table 5
Regression Model Results

Variables	**DIV**	
	Coef.	**Estat. Z**
Power_Est	0,035	0,759
Power_Prop	-0,121	0,509
Power_Prest	0,556	0,084*
Ida	-0,006	0,083*
Gen	0,807	0,093*
Tam	0,445	0,000***
ROA	-0,233	0,359
Ide	0,002	0,550
Firm fixed effects	Yes	
Year fixed effects	Yes	
Number of firms	215	
Number of observations	1453	
Adjusted R^2	34,43%	

Note. DIV = Environmental Disclosure; Power_EST = Structural Power; Power_PROP = Ownership Power; Power_PREST = Prestige Power; Ida = CEO Age; Gen = CEO Gender; Tam = Firm Size; ROA = Return on Assets; Ide = Firm Age.
***, **, * = Statistical significance at 1%, 5%, and 10%, respectively.
Source: Research data (2024).

The regression results presented in Table 5 show that the variable *Power_Prest* had a coefficient of 0.556 and a Z-statistic of 0.084, indicating a positive relationship that is statistically significant at the 10% level with environmental disclosure. In contrast, the variables *Power_Est* (coef. = 0.035; Z = 0.759) and *Power_Prop* (coef. = -0.121; Z = 0.509) had non-significant coefficients, with p-values greater than 0.10, suggesting that these forms of *CEO power* do not impact environmental disclosure. Among the control variables, *TAM* (company size) had a positive and significant coefficient (coef. = 0.445; Z = 0.000), reinforcing that larger companies tend to disclose more environmental information, while *IDA* (CEO age) showed a negative and statistically significant coefficient (coef. = -0.006; Z = 0.083), indicating that younger CEOs are associated with greater environmental transparency.

Although company size (TAM) was the variable most strongly associated with environmental disclosure, other significant variables were analyzed in greater depth to allow for a better interpretation.

As mentioned, the findings revealed that only prestige power (Power_Prest) was significantly and positively related to environmental disclosure. This result aligns with the research of Cheng (2023), which showed that companies led by award-winning CEOs tend to perform better in corporate social responsibility (CSR). The author highlights that recognized CEOs are highly valued in the market, providing them with greater opportunities, such as seats on the boards of large corporations. Such recognition can be attributed to the reputation these executives build within the institutional environment and among stakeholders, affecting the perception of their influence on corporate performance. Additionally, Yin et al. (2023) explored how award-winning CEOs balance personal interests and stakeholder demands when deciding between internal and external CSR practices. Their findings suggest that, after receiving social communication awards, CEOs tend to prioritize external CSR initiatives, which are more visible to the public and therefore contribute more to their image and prestige. This reinforces the idea that public recognition of executives influences their actions in favor of sustainability.

On the other hand, other types of power, such as structural power (assessed through CEO duality and holding multiple positions), did not show significant relevance. The results obtained by Lagasio and Cucari (2019) support this conclusion, showing that CEO duality has little impact on corporate environmental disclosure. Ownership power (Power_Prop) also lacked statistical significance, as it was not significant in the study by Lagasio and Cucari (2019). In research conducted in Malaysia, Abdul Majid et al. (2023) reported a negative association between CEO ownership power, measured by their shareholding, and company decisions regarding the disclosure of carbon emissions. These findings reinforce agency theory, suggesting that an entrenchment effect occurs when CEOs hold a significant equity stake in the company, which negatively influences decisions related to transparency in carbon emissions disclosure.

In Wukich's (2020) study conducted in the United States, it was observed that the relationship between CEO power and corporate disclosures is not uniform, varying significantly depending on the context. This variability may help explain both the significant and non-significant results found in the present research and in other contexts, which frequently yield divergent outcomes. According to Wukich (2020), the level of CEO power can influence their behavior regarding information disclosure. Specifically, when CEOs hold substantial power, they may choose to share less information voluntarily in order to protect and maintain their position of authority. Such behavior can contribute to lower transparency in disclosures, reflecting a strategy aimed at preserving their personal and professional interests.

Regarding the independent variables related to CEO power, only Hypothesis 3 (H3) was confirmed, demonstrating a positive relationship between CEO prestige power and environmental disclosure. This indicates that CEOs with higher prestige (i.e., award-winning) tend to promote greater transparency in environmental matters. Conversely, Hypotheses 1 (H1) and 2 (H2) were not supported by the data, suggesting that, for the studied sample, structural power and ownership power do not have a significant impact on environmental disclosure. These results imply that while CEO prestige may be positively related to environmental disclosure practices, power derived from organizational structure and ownership does not have the same effect, possibly reflecting a different dynamic in the relationship between power and environmental responsibility within the analyzed sample.

Among the CEO control variables, both age and gender were significant. The observed relationship for age was negative, indicating that younger CEOs are associated with higher environmental disclosure. Supporting the present study, Haider et al. (2019), analyzing a sample of 2,730 annual observations from Australian firms between 2004 and 2013, found that younger CEOs tend to enhance the quality of the information environment and promote greater disclosure of non-financial information, including environmental issues. Similarly, Oware and Awunyo-Vitor (2021) highlight that younger CEOs are more likely to adopt an independent sustainability report to communicate environmental information to stakeholders.

These findings are consistent with existing literature, which identifies a statistically significant negative relationship between CEO age and greenhouse gas emissions disclosure. Previous studies, such as Chithambo et al. (2020), corroborate this relationship, indicating that younger CEOs tend to promote higher-quality environmental disclosures. In contrast, older CEOs often avoid risky investments, including expanding environmental disclosures, as noted by Chithambo et al. (2020). This behavior can be attributed to a greater tendency among more experienced executives to maintain a conservative approach, potentially negatively affecting transparency and innovation in the company's environmental practices.

Regarding gender, male leadership among CEOs was associated with higher corporate disclosure, including environmental information. However, this result should be interpreted cautiously, as more than 90% of the firms in the sample had male CEOs, which may introduce bias into the findings. This outcome diverges from Lagasio and Cucari (2019), who reported a positive association between female CEOs and more effective and transparent voluntary environmental disclosure. According to the authors, women in leadership positions tend to promote greater environmental responsibility. Oware and Awunyo-Vitor (2021) also highlight the low female representation in top corporate positions, reflecting a gender imbalance that may influence the interpretation of gender impacts on environmental disclosure.

Company size was also significant, corroborating existing literature (Cheng, 2023; Razali et al., 2016), which indicates that larger firms disclose more information, including environmental data. According to Suttipun and Stanton (2012), larger firms have more stakeholders demanding a higher level of disclosure. Conversely, ROA and firm age were not significant. Bhatia and Tuli (2017) point out that professional teams in older firms are more established and well-controlled to handle sustainability disclosures, which was not confirmed in this study. Similarly, in Wukich's (2020) study, firm age was also not significant.

The conclusions of this study provide a valuable contribution to the literature on the relationship between CEOs and environmental disclosure. This research establishes that the effective implementation of environmental practices within firms largely depends on proactive leadership from CEOs. Such leadership not only influences the adoption of these practices but also plays a crucial role in how companies communicate their environmental initiatives to the public and stakeholders. Therefore, the ability of CEOs to lead with a sustainability-oriented vision is essential to ensure that companies not only adopt environmental practices but also effectively promote and disclose them.

5 FINAL CONSIDERATIONS

This study examined the relationship between CEO power and environmental disclosure among Brazilian publicly listed companies on B3 between 2010 and 2022. The motivation for this research stemmed from the scarcity of studies focused on emerging markets, highlighting a gap in the literature regarding how CEO power may influence the way companies disclose their environmental practices. CEO power was assessed based on the metrics developed by Finkelstein (1992), while environmental disclosure was analyzed through key indicators related to the Sustainable Development Goals (SDGs), as defined by UNCTAD/UN in 2019.

The sample comprised 215 companies, resulting in 1,453 observations over a 13-year period (2010–2022). The necessary data for the analysis were extracted from the Refinitiv Eikon® database. Regarding the study's independent variables representing CEO power, only Hypothesis 3 (H3) was confirmed, indicating a positive relationship between prestige power and environmental disclosure. The other hypotheses (H1 and H2), which investigated structural power and ownership power, were not supported, suggesting that in the analyzed context, these types of power do not have a significant relationship with environmental disclosure.

Among the control variables, CEO age and gender were significant, corroborating the idea that younger and male CEOs are associated with higher environmental disclosure. For firm-level control variables, only company size was statistically significant, confirming the trend that larger firms disclose more information, including environmental data. Return on assets (ROA) and company age, on the other hand, were not statistically significant.

Environmental disclosure not only informs stakeholders but can also serve as an incentive mechanism for firms to adopt more sustainable practices, contributing to a more balanced development between economic growth and environmental preservation. This study contributes to the literature by demonstrating that CEO power can be a relevant factor in environmental disclosure, particularly regarding executive prestige. Additionally, the results offer practical implications for the market by aiding in the selection of CEOs whose profiles align with the growing demands for environmental responsibility.

The findings of this study indicate that CEO power can significantly influence the level of environmental disclosure in companies, reinforcing the need for alignment between corporate leadership and sustainability strategies to generate long-term positive impacts. For investors and other stakeholders, understanding the relationship between CEOs and environmental disclosure may serve as a strategic factor in evaluating a company's reputation and commitment to sustainability.

The choice of the Brazilian market does not represent a limitation but rather a relevant aspect for advancing the literature on corporate sustainability in emerging economies. Future research could expand this approach by including comparative analyses across countries and examining characteristics of the Board of Directors that may interact with CEO power in determining environmental transparency. Furthermore, in-depth investigations within environmentally sensitive sectors could enrich understanding of the factors driving environmental disclosure. Measuring CEO power through different variables also opens avenues for future research.

It was also observed that a considerable number of companies in the sample scored zero in environmental disclosure. Although this reflects a challenging scenario for environmental transparency in Brazil, the median-based analysis captures relevant trends without allowing extreme values to distort conclusions. Finally, this study reinforces the importance of corporate sustainability by linking CEO characteristics with environmental disclosure, providing both academic and practical implications for governance and environmental responsibility.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interest regarding this submitted work.

AUTHOR CONTRIBUTIONS

Roles	1ª author	2ª author	3ª author	4º author
Conceptualization	♦	♦	♦	♦
Data Curation	♦	♦		
Formal Analysis	♦	♦		
Funding Acquisition	♦			
Investigation	♦	♦		
Methodology	♦			
Project Administration	♦	♦	♦	♦
Resources	♦	♦	♦	♦
Software	♦	♦		
Supervision	♦		♦	
Validation	♦	♦	♦	♦
Visualization	♦	♦	♦	♦
Writing – Original Draft	♦	♦	♦	♦
Writing – Review and Editing	♦	♦	♦	