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Regular article

Sustainability report credibility and market performance of Brazilian companies

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ABSTRACT

Credibility is crucial in the communication between companies and society, particularly when addressing sustainability practices. This quality, vital for establishing effective communication, represents a significant challenge in corporate communication. In this context, this study aims to evaluate the impact of the credibility of environmental and social disclosures on the performance of companies listed on the Brazilian capital market. Analyzing a sample of 34 companies, we employed ALT software (Textual Readability Analysis) to assess the credibility of sustainability reports and the impact of this on company's performance. Using hierarchical linear modeling, our results reveal that the credibility of environmental and social reports significantly influences the Brazilian companies' market performance in potentially polluting industries.

1. Introduction

Climate change and environmental degradation have mobilized many people, groups, and authorities to support the conscious use of natural resources. The climate events that have occurred in recent years have impacted global society, making it vulnerable to climate changes driven by anthropogenic factors (Clarke et al., 2022). This situation has prompted industries to adopt environmental and social strategies and to disseminate this information to society. According to the website of the Governance & Accountability Institute[1], which examined the behavior of the 500 largest companies as of 2011, there was a 96% increase in the number of US companies highlighting their relationship with the environment and social issues through sustainability reports between 2011 and 2021.

In this context, addressing the communication process that involves companies and their relationship with the environment, particularly the credibility of environmental and social disclosure reports, involves dealing with ethical and moral factors described by Habermas (1984) in his theory of communicative action. These factors are crucial to maintain solid communication with the public on sustainability-related information. Effective communication is built on several essential criteria: truthful (reliable) content; comprehensiveness (exhaustiveness); compliance (appropriateness); and readability (understandability). These elements enable stakeholders (investors, government, suppliers, consumers, among others) to understand, trust, and make informed decisions based on the information contained in the reports. However, a reduced number of environmental and social actions disclosed by companies in the Brazilian capital market can indicate that they have not yet fully adapt to environmental preservation and protection measures.

A company has its environmental and social performance shaped by its response to external factors (government regulations, technological advances, social behaviors, and market structures), which compel companies to adopt new strategies in response to changing circumstances. This, in turn, is expected to generate benefits for society through the responsible adoption of better environmental and social practices during the period, leading to market gains in subsequent periods.

Abbreviations: ALT, Análise de Legibilidade Textual (Textual Readability Analysis); B3, Brasil, Bolsa e Balcão (Brazil, Exchange and Over-the-counter); ECL, Environmental Credibility Level; EP, Environmental Performance; ER, Environmental Report; GRI, Global Reporting Initiative; IBAMA, Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute for the Environment and Renewable Natural Resources); HLM, hierarchical linear modeling; MP, Market Performance; SCL, Social Credibility Level; SP, Social Performance; SR, Social Report

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In this article, we investigate the influence of environmental and social sustainability reports on the relationship between the socio-environmental and market performances of publicly traded Brazilian companies. Brazil was chosen for this study due to its rich biodiversity, which houses more than 20% of the total known species and is home to the largest humid tropical forest in the world.

The primary motivation for this study was to understand the relationship among Brazilian companies, the environment, and society in the face of contemporary climate change, with a specific focus on the role of sustainability report communication in shaping this relationship. To this end, based on the four credibility indicators from Habermas's Theory of Communicative Action, we developed and utilized software capable of measuring three of these indicators, as detailed in Section 4.4.

The justification for developing this research is the intense environmental degradation, such as deforestation and burning, and the consequent impacts of climate change that have affected humanity globally. In light of this scenario, several authorities have mobilized to propose and implement global solutions that can contain the advance of climate change. These initiatives are directly related to issues such as global warming, greenhouse gas emissions, destruction of the ozone layer, water resource management, and waste disposal policy.

The main contribution of this study was to understand the role that the credibility of sustainability reports has in communication between companies and society. We understand this communication as the one capable of transmitting information, ideas, and opinions in a detailed and clear manner, avoiding misunderstandings and conflicts when properly understood. Credible communication is the one which makes adequate use of the linguistic resources available in a language, without neglecting the ethical and moral principles essential to promote mutual understanding and trust between the parties involved, in addition to enabling the achievement of the objectives established in this social interaction.

Therefore, it is possible to state that communication plays a fundamental role in the construction of a company's history and in relationships with different audiences. The ability to communicate effectively and transparently is an essential characteristic for companies, as it is the key to building and maintaining solid and lasting relationships.

2. Environmental, social and market performance

Over the years, financial information has stopped being the only measure of a company's performance (Dobre et al., 2015). To ensure market competitiveness, companies must include in their reports not only financial data but also environmental and social practices, as well as the benefits these practices generate for employees and society. In this context, sustainability reports have gained prominence and are now recognized as valuable tools for performance analysis.

Given this, we aim to determine whether environmental and social actions impact the market performance of companies in the Brazilian capital market and whether the credibility of the disclosed information influences this relationship. Some researchers have sought to identify this connection. For example, Moneva and Ortas (2010) confirmed that the dissemination of socio-environmental strategies leads to positive returns, resulting in improved market performance, at least in the long term.

The disclosure of credible environmental and social information is the best approach to establish prudent communication with stakeholders when adopting a model of socially and environmentally responsible behavior. However, when companies do not meet the same disclosure standards, they hinder opportunities for comparative performance analysis, making it difficult for stakeholders to make informed decisions (Collins & Hansen, 2011). According to Saida (2009), the communication process that involves the dissemination of social and environmental reports tends to follow three practices: rational, conformist, and moral. The first considers that ethical attitudes stem from a rational decision-making process. The second suggests that compliance and the disclosure of this fact to the public help companies manage stakeholders' interests. The third practice involves moral values, which are seen as essential for developing actions that influence business activities. By adopting these practices, the impact of socio-environmental information within this communication process tends to generate a positive market reaction, thereby enhancing companies' market performance.

In this scenario, we observe that sustainability reports have assumed a crucial role in the market due to climate change. These reports facilitate the understanding of the actions carried out by companies owing to the credibility factors identified, as noted by Xiao and Shailer (2022). Green initiatives taken up by companies that participate in the capital markets and the quality of their disclosures influence both the market opinion and the performance of these companies, as discussed by Kim et al. (2022). Consequently, the credibility of sustainability reports enables investors to accurately analyze socio-environmental actions and make informed and sustainable decisions, as cited by Chiba et al. (2018). Conversely, a failure to comprehend these reports, which detail the environmental and social performance achieved by corporations, can negatively impact investors' decision-making processes, as indicated by Khan et al. (2024).

Numerous studies have demonstrated the influence of environmental and social performance on market performance. Ghoul et al. (2011), in a study conducted with American companies, showed that those who engage in socially responsible practices experience lower risks and higher market value. Ziegler et al. (2007) found a positive correlation between environmental performance and market performance among European companies. Making this information clearly available in environmental reports is crucial for attracting public attention.

In Malaysia, where environmental disclosure is voluntary, companies achieve good market returns when investments in environmental actions are well publicized (Nor et al., 2016). According to Feng et al. (2018), the transparency of socio-environmental information plays an important role in the corporate environment, and as a result, companies with high corporate social responsibility experience fewer negative market reactions when issuing shares.

In the Brazilian context, sustainable practices in publicly traded companies, which can cause pollution, are still in the maturation phase. However, these practices allow companies dedicated to environmental conservation to achieve better corporate performance, aligning the company's sustainable objectives with those of investors and contributing to growth and sustainability (Possebon et al., 2024). Another important aspect to remember is the influence of culture on sustainability practices, the effects of which can vary from country to country, influencing investor's decision making (Miska et al., 2017). Therefore, socially responsible investors in Brazil are influenced by social and institutional factors, such as economic, political, and cultural conditions that arise and impact the way investors make their decisions (Ortas et al., 2012). This generates a negative effect on the capital market, as economic turbulence destabilizes companies. Furthermore, the low relevance of environmental and social issues in the community, as pointed out by Dyck et al. (2017) and other researchers, can significantly impact the environmental and companies' social performance.

In countries like Brazil, where sustainable awareness in decision making is still evolving, the challenges related to achieving sustainable transport are high (Malvestio et al., 2018). Another important point concerns socio-environmental disclosures in Brazil, which still present some inaccuracies regarding environmental preservation and protection actions by some sectors. Furthermore, there is still no uniformity in the disclosure of some sectors, even though it is legally provided for in the Brazilian Federal Constitution (Trierweiller et al., 2013). Given this finding, Trierweiller et al. (2013) pointed out that the agricultural sector had the worst performance in environmental management disclosure, while the paper and mining sectors had the best performance. However, a notable case associated with the risks of mining activities

materialized in the tragedies of the Brazilian cities of Mariana (2015) and Brumadinho (2019). Vale, the mining company responsible for these high-impact events, has caused significant damage to public health, generating negative impacts on the affected communities. As a result, the Corporate Social Responsibility practices of this mining company have taken a different direction than expected, since conflicts associated with socio-environmental criteria increase as the mineral extraction process expands around the world.

3. Credibility from the theory of communicative action

The theory of communicative action, proposed by Habermas (1984), emphasizes dialogue as a fundamental instrument for social action and social responsibility, even within the business context. According to this theory, dialogue aims to achieve consensus in order to coordinate and implement business action plans. In both private and public spheres, the theory seeks to base opinions on the ability to coordinate and execute such plans, which is tangibly reflected in corporate reports. Companies are expected to disclose sustainable information in a credible manner to serve the primary users of sustainability reports, such as shareholders and managers. Social management does not reject the market economy, but instead proposes a critique and transformation of contemporary economic structures, with a strong emphasis on ethical and moral considerations.

(Habermas, 1984) outlines four validity claims necessary for effective communication: (i) understandability, or clarity of information; (ii) truth, referring to the correspondence with the objective world; (iii) adequacy, regarding shared social standards; and (iv) sincerity, concerning the communicator's honesty. These dimensions are essential to ensure the credibility of the information disclosed.

In companies, credibility should be a central component of Corporate Social Responsibility (CSR) reports, as it is fundamental for making informed decisions and represents a crucial criterion in the communication between stakeholders. The application of Habermas' dimensions of credibility enhances communication and guides investors toward more accurate decisions (Balluchi et al., 2021).

Based on the information provided, and considering the credibility of sustainability reports, we hypothesize that companies with a higher level of environmental and social credibility are more likely to present their actions authentically to persuade the public, thereby achieving better market performance. Consequently, we present the following hypotheses for this study (Fig. 1):

H_1: The level of credibility of the environmental report influences the relationship between the company's environmental performance and market performance.

H_2: The level of credibility of the social report influences the relationship between the company's social performance and market performance.

4. Methodology

4.1. Sample

Of the 434 companies listed on the Brazilian capital market during the analysis period of this research, 118 were identified as industries engaged in potentially polluting activities and whose operations are supervised by IBAMA and regulatory agencies. Of these, 34 companies released consecutive sustainability reports between 2015 and 2019, which was considered the period of analysis. Within this sample, the public utility service sector (9 companies) stood out, leading the others in the quality of its disclosures. The second largest was the food and beverage industry sector (6 companies), followed by the mineral extraction and treatment sector (4 companies).

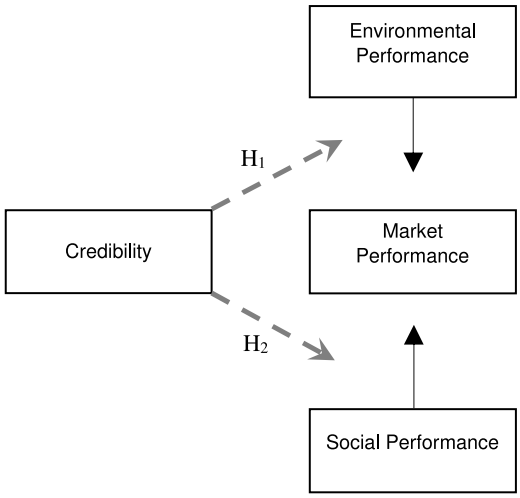

Fig. 1. Hypotheses H_1 and H_2: credibility influences the relationship between socio-environmental performance and market performance.

4.2. Calculation of market performance

We used the Refinitiv database to assess the market performance (MP) of the companies analyzed and to evaluate the effect of credibility on the dissemination of socio-environmental information. We consider two indicators to measure market performance: Earnings per Share and Market to Book Value. These indices are used to price shares and assess the companies' potential in the capital market, using financial statements as a basis. Earnings per Share measures a company's profitability by indicating how much profit each outstanding share of common stock has generated. The Market to Book Value index compares the market value of a company to its book value.

4.3. Calculation of environmental and social performance

To quantify the companies environmental performance (EP) and social performance (SP), we analyzed investments in environmental and social initiatives reported according to the GRI guidelines (G4, see Table 1). It is important to note that these investments represent resources that are not distributed to shareholders.

Using the GRI guidelines, we quantified the total investments made by Brazilian companies listed on the B3 stock exchange to mitigate environmental and social impacts. Table 2 summarizes the dimensions investigated according to the GRI guidelines.

4.4. Calculation of environmental and social credibility levels

The focus of our study was to evaluate the credibility of sustainability reports (both environmental and social) and their influence on company's performance. To achieve this, we used credibility as a moderating variable, which, according to the Theory of Communicative Action, is determined by understandability, appropriateness, completeness, and reliability.

The first three indicators, understandability, appropriateness, and completeness, were analyzed using ALT — *Textual Readability Analysis* (Moreno et al., 2022, 2023; Souza et al., 2021), a software capable of calculating understandability (readability), appropriateness, and word frequencies in Portuguese-language texts. Readability measures how easy a text is to read. Several formulas are available in the literature, with some of the most well known being the Flesch–Kincaid Grade Level (Kincaid, 1975), the Gunning Fog Index (Gunning, 1952), the Automated Readability Index (ARI) (Smith & Senter, 1968), and the Coleman-Liau Index (Coleman & Liau, 1975). Generally, these formulas

Table 1
Environmental and social performance indicators.

Dimension	Environmental indicators	Base	Previous Studies
Environmental protection	Investments in biodiversity Treatment of emissions, waste, and effluents Water and energy efficiency	GRI Guidelines	Lock and Seele (2016); Pratama et al. (2019); Balluchi et al. (2021)
Environmental management	Improvements in infrastructure Environmental licenses and certifications Costs for monitoring, maintenance, and environmental studies		
Dimensions	Social Indicators	Base	Previous Studies
Internal public	Training and education Health and safety at work	GRI Guidelines	Pratama et al. (2019)
External public	Combating hunger, education, health, sport, sponsorship, donations		

Table 2
Environmental and social performance indicators based on GRI (2014–2018).

Performance	Dimensions and measure
Environmental	Environmental protection: If there are investments to ensure progress and maintain preservation, with the environmental impact less than the benefits generated by its exploitation.
	Environmental management: If there are investments to ensure progress and maintain preservation, with the environmental impact less than the benefits generated by its exploitation.
Social	Internal public: If there are investments to promote social well-being, with training and security actions, as well as public policies to benefit the surrounding population.
	External public: If there are investments to promote social well-being, with training and security actions, as well as public policies to benefit the surrounding population.

Table 3
Measurement of the credibility of environmental and social reporting (2014–2018).

Indicators	Measurement	References
Understandability Appropriateness	Use of unified readability indexes: Flesch–Kincaid, Gunning fog, ARI, and Coleman-Liau	Lock and Seele (2016); Balluchi et al. (2021)
Completeness	$\frac{\sum \text{words} - \text{GRI key}}{\sum \text{content words (ER and SR)}}$	Balluchi et al. (2021)
Reliability	$\frac{\sum \text{Guidelines met (ER and SR)}}{\sum \text{Req. GRI guidelines (ER and SR)}}$	Pratama et al. (2019)

are based on the average length of sentences (longer sentences are less readable) and the proportion of complex words (a higher percentage of complex words reduces readability). The arithmetic mean of these four indicators, which range from 5 (very high readability) to 20 (very low readability), was used to assess the understandability and appropriateness of the reports, as shown in the first two lines of Table 3.

The third indicator, completeness, was derived from the "word count" functionality of the ALT software. This indicator, presented in the third line of Table 3, represents the percentage of keywords from the GRI guidelines included in the reports (Balluchi et al., 2021).

The final indicator, reliability, was measured without the ALT software. To obtain this, we calculated the ratio of fulfilled guidelines to the total GRI guidelines (G4) suggested in the published sustainability reports. This process was performed manually. This model was proposed by Pratama et al. (2019), who evaluated the decline in reliability in the disclosure of sustainability reports by measuring the degree of the information transparency.

All company data, including market performance, environmental and social performance, and levels of social and environmental credibility, were synthesized using the ADRIANA multicriteria method (Interactive Relative Decision Analysis of Acquisition and Non-Acquisition) (Hein, 2020), a technique based on the Behavioral Accounting work of Richard Thaler. ADRIANA method was used to rank the data hierarchically.

Table 4
Analysis of the market performance variable using ICC.

Parameter	Estimate	Error	Wald Z	Sig.
Residue	84.365	10.230	8.246	0.000
Intercept	54.992	17.549	3.134	0.002

4.5. Hierarchical linear modeling

To calculate the relationship between market performance and environmental and social performance, we used hierarchical linear modeling (HLM), a statistical method designed for data organized into hierarchical levels. HLM creates a separate regression model for each group, distinguishing them by different levels.

The groups were categorized into levels separated by tertiles. Low credibility was assigned to the first tertile, average credibility to the second tertile, and high credibility to the third tertile. Consequently, the analysis aimed to evaluate the influence of the levels of credibility in environmental and social disclosures on the relationship between internal performance (dependent on the company's actions) and external performance (dependent on the market) to test the hypotheses.

We used the following linear model to examine the relationship between market performance (MP) and environmental (EP) or social performance (SP):

$$\mathrm{MP}_{i,j,t} = \gamma_{00} + (\gamma_{10} + u_{1j})\mathrm{EP}_{ij} + \beta_2 \mathrm{ECL}_j + \beta_3(\mathrm{EP} \times \mathrm{ECL})_{ij} + + u_{0j} + \epsilon_{ij} + \epsilon_{jt} \quad (1a)$$

$$\mathrm{MP}_{i,j,t} = \gamma_{00} + (\gamma_{10} + u_{1j})\mathrm{SP}_{ij} + \beta_2 \mathrm{SCL}_j + \beta_3(\mathrm{SP} \times \mathrm{SCL})_{ij} + + u_{0j} + \epsilon_{ij} + \epsilon_{jt}, \quad (1b)$$

where $\mathrm{MP}_{i,j,t}$ represents the market performance of the ith company at the jth credibility level and time t, $\mathrm{EP}_{i,j}$ ($\mathrm{SP}_{i,j}$) denotes the environmental (social) performance of the ith company at the jth credibility level, NCREP_j ($\mathrm{NCRES}j$) indicates the level of environmental (social) credibility for the jth company, and u_{0j}, ϵ_{ij}, and ϵ_{jt} represent errors.

Finally, we used the intraclass correlation coefficient (ICC) to measure reliability when data are organized into groups, i.e., credibility levels. Table 4 displays the reliability analysis for this variable.

ICC assesses the correlation between two observations from the same group. We estimate $\sigma^2_{u_{0j}}$ and $\sigma^2_{\epsilon_{ij}}$, which correspond to the intercept variance (variance at the contextual level) – representing the difference between the observed and predicted values of the dependent variable – and the residual variance (variance at the individual level). The result of Eq. (1) shows that the reliability level for the Market Performance variable exceeded 0.10, indicating the presence of multilevel data.

$$\mathrm{ICC} = \frac{54.992}{54.922 + 84.365} = 0.3946 \geq 0.10 \quad (2)$$

Table 5
Influence of credibility levels of environmental disclosure on the relationship between environmental performance and market performance.

Parameter	Estimate	Error	Gl	T	Sig.	95% Confidence interval
Intercept	0.13578	3.0803	147.151	2.92	0.005	(−5.9516, 6.2232)
EP	−0.36222	0.5289	168.437	−2.99	0.004	(−1.4064, 0.6819)
ECL4=1	−0.96601	3.6379	169.251	−3.23	0.001	(−8.1475, 6.2155)
ECL4=2	−0.68532	2.9935	165.929	−2.67	0.009	(−6.5956, 5.2249)
ECL4=3	0.0000[a]	0.0000	–	–	–	–
ECL4=1 × EP	0.2946	0.5337	169.888	3.14	0.002	(−0.7589, 1.3481)
ECL4=2 × EP	0.3236	0.5257	169.842	2.67	0.009	(−0.7141, 1.3613)
ECL4=3 × EP	0.0000[a]	0.0000	–	–	–	–

[a] This parameter is set to zero because it is redundant.

Notes: EP Environmental Performance;
ECL=N: Environmental Credibility Level N;
ECL=N × EP: Effect of Environmental Credibility Level N on Environmental Performance.

5. Results

5.1. Analysis of hypothesis H_1

The linear regression calculation based on Eq. (1)(a) yielded the data presented in Table 5, which includes an estimate of environmental credibility at the *i*th level (ECL4=*i*). Based on this table, we derived the relationship between market and environmental performance across the three levels.

$$\text{Level 1: } MP_1 = -0.830 - 0.068EP \tag{3a}$$

$$\text{Level 2: } MP_2 = -0.549 - 0.039EP \tag{3b}$$

$$\text{Level 3: } MP_3 = \quad 0.136 - 0.362EP. \tag{3c}$$

At level 1, the intercept, or model constant β_0, which applies across levels, is 0.13578. When −0.96601 is added, representing the level of environmental credibility (ECL = 1), the result is 0.830, as shown in Eq. (3)a). The coefficient for environmental performance (EP) is −0.36222, but considering the study model, we added 0.294577, representing the effect of the environmental credibility level on environmental performance ([ECL=1]×EP), yielding −0.068.

An anticorrelation is observed at all levels. For group 1, the environmental credibility level [Eq. (3)a) is below average, negatively influencing the relationship between environmental performance (EP) and market performance (MP). At level 2 [Eq. (3)b), although the effect is smaller, the level of credibility remains below average, which affects this relationship. At level 3 [Eq. (3)c], where high environmental credibility was anticipated, the opposite occurred, with environmental performance further compromising market performance (MP). Across all levels, greater investments in environmental performance (EP) negatively impacted market performance (MP). Thus, the hypothesis was not confirmed, as the highest credibility (level 3) negatively influenced the relationship.

(Tachizawa & Carvalho, 2002) see state that spending on environmental protection represents a competitive advantage with long-term returns, because in the short term it overloads results, generating unfavorable effects on market performance by influencing profit distribution. This finding is consistent with research by King and Lenox (2008), suggesting that shorter analysis periods increase the likelihood of negative effects on market performance, as short-term analysis does not allow stakeholders to fully react to the information provided.

External factors can also influence performance, even with socially responsible behavior. This is particularly true in code-law countries, where there are few investors inclined toward environmental criteria. Therefore, the authors considered that the country's culture can determine whether stakeholders are interested in corporate social responsibility practices.

From Eq. (3), it is evident that credibility affected the relationship between environmental performance (EP) and market performance (MP) at all levels. Saida (2009) studied 72 multinational companies in countries with both common law and code law systems (American and European) and confirmed that individual characteristics, such as culture, market structure, and the economy of each country; influence the level of corporate's information disclosure (socio-environmental, accounting, etc.) and, consequently, market reactions (from investors, consumers, etc.).

Regarding voluntary disclosure, Friske et al. (2023) examined the effect of sustainability reporting on market performance using Signaling Theory. The results showed that sustainability reports negatively influence market value when measured in the short term, except for companies that ensure that their reports undergo external audits, enhancing the credibility of sustainability-related information. In this study, only 38% of the companies reported independent external verification, with limited assurance, which was another limiting factor for the short-term analysis.

Thus, voluntary sustainability reporting has become a barrier to transparency, leading to the omission of environmental and social actions. Some companies listed on B3 stated that they develop internal environmental policies for management only, without plans for public disclosure. B3 has encouraged the sharing of strategies that meet the sustainability objectives of companies listed on the Brazilian market (Chaves et al., 2018), but with limited success.

The absence of mandatory sustainability reporting in Brazil weakens market performance and diminishes credibility (Ioannis & George, 2019). As a result, socially responsible investing has not yet gained significant momentum in the Brazilian market. The consistently low levels of voluntary disclosure among companies listed on the B3 list indicate that investors tend to prioritize financial results over the methods used to achieve them. The Brazilian government must recognize the critical role of sustainability in investments and consider enacting legal regulations for companies listed on the Brazilian stock exchange. Although there have been attempts to make sustainability reporting mandatory for publicly traded companies, such as Senate Bill No. 289 of 2012, the initiative was archived on December 21st, 2018.

Regarding the Corporate Sustainability Index promoted by B3, Ortas et al. (2012) pointed out that socially responsible investors in Brazil are affected by institutional factors. Cunha and Samanez (2014) considered that the real performance associated with the risk of socially responsible companies discourages sustainable investors in Brazil from continuing to invest in companies with this characteristic. A prominent example are the risks associated with mining activities, which became manifest in the tragedies of Mariana (2015) and Brumadinho (2019). Vale, the mining company responsible for these highly impactful events, caused significant disruptions to public health, leading to the investors' withdrawal, halting operations, and reduced profits, although temporarily. Vale's environmental practices have negatively affected the economic and social dimensions of the sector, thus adversely influencing the market.

Despite Brazil's rich biodiversity, stakeholders have yet to fully acknowledged the environmental impacts caused by industrial activities (Amuah et al., 2023). As a result, the credibility of disclosed environmental information has not positively impacted the relationship between environmental performance and market performance,

Table 6
Influence of the levels of credibility of social evidence on the relationship between social performance and market performance.

Parameter	Estimate	Error	Gl	T	Sig.	95% Confidence interval
Intercept	1.778	3.843	132.362	2.85	0.006	(−5.8256, 9.3813)
SP	0.230	0.434	169.263	2.73	0.008	(−0.6283, 1.0876)
SCL=1	−2.665	4.052	155.962	−2.53	0.012	(−10.671, 5.3406)
SCL=2	−1.078	3.871	161.679	−3.23	0.001	(−8.7226, 6.5664)
SCL=3	0.000[a]	0.000	–	–	–	–
SCL=1 × SP	−0.294	0.438	169.697	−3.14	0.002	(−1.1616, 0.5709)
SCL=2 × SP	−0.324	0.434	169.757	−2.85	0.006	(−1.1827, 0.5337)
SCL=3 × SP	0.000[a]	0.000	–	–	–	–

[a] This parameter is set to zero because it is redundant.

Notes: SP: Social Performance;
SCL=N: Social Credibility Level N;
SCL=N × SP: Effect of Environmental Credibility Level N on Environmental Performance.

as Brazilian investors have not yet seriously considered crucial environmental concerns. Similarly, Ellwanger et al. (2022) highlighted that Brazil, renowned globally for its vast biodiversity and extensive forest cover, still nurtures a "popular imagination" that views natural resources as inexhaustible.

5.2. Analysis of hypothesis H_2

We present in Table 6 the data obtained from multilevel data regression. Similarly to what was mentioned in Section 5.1, we wrote Eqs. (4), which represents the influence of social credibility on the relationship between social and market performance.

$$\text{Level 1: } MP_1 = -0.887 - 0.065SP \tag{4a}$$

$$\text{Level 2: } MP_2 = -0.700 - 0.095SP \tag{4b}$$

$$\text{Level 3: } MP_3 = \quad 1.778 + 0.230SP \tag{4c}$$

Anticorrelations are evident in Eqs. (4)(a) and (4)(b), corresponding to groups with low and medium credibility. This finding is consistent with the study by Oprean-Stan et al. (2020), which demonstrated that poor management undermines credibility, negatively affecting market performance and company's sustainability.

In contrast, the group associated with level 3, characterized by high credibility, exhibited a positive effect on this relationship, as expected. Consequently, increased investments in public-oriented policies positively influence market performance (MP). These results are consistent with (Collins, 2001), who states that developing strategies for social purposes can be crucial to maintaining a competitive edge. Thereby, companies must develop strategies (both environmental and social) for social purposes as a core value throughout their history. This finding also supports (Danieli et al., 2021)'s research, which emphasizes that social strategies and policies for evaluating corporate sustainability should accurately reflect social responsibility practices, even in countries lacking legal requirements, to influence investors and enhance market value.

Other studies have shown that social aspects exert a psychological effect on both internal and external audiences, fervently influencing market performance. Consequently, conscious dissemination of socially responsible practices is essential to meet internal and external demands. This requires the company's management to adhere to rationality, compliance, ethics, and morality in the information disclosed, which are essential criteria for attracting and retaining stakeholders (Feng et al., 2018; Ghoul et al., 2011; Saida, 2009; Ziegler et al., 2007). Thus, the theory of communicative action plays a key role in this communication process, using communicative rationality to foster social interaction and achieve consensus with stakeholders. This approach contrasts with instrumental rationality, which, in pursuit of self-interest, disregards the surrounding reality (Habermas, 1984).

According to Habermas (1984), society can be viewed as divided into two axes: the system (market and government) and the world of life (personality, societal standards and social knowledge derived from culture, traditions and religions). The former consists of elites who control, command, and propagate policies to serve their own interests. The latter comprises the lower classes, the majority who, without communicative rationality, would be manipulated by the system and coerced into decisions that neglect the reasoning essential for life in society.

Therefore, the second hypothesis was not rejected. The results confirm that the credibility of environmental and social disclosure reports influences the relationships between environmental and social performance and the Brazilian companies' market performance.

6. Final considerations

The growing mistrust among investors about the accuracy of disclosed information has intensified discussions around corporate communication. In response to this concern, we conducted a study to evaluate the effects of the credibility of environmental and social reports on the companies' performance in the potentially polluting sectors listed on the Brazilian capital market (B3).

Our analysis, involving a sample of 34 companies, examined data related to the credibility of environmental and social responsibility reports (2014–2018), investments in environmental and social strategies (2014–2018), and market performance indicators (2015–2019). The study focused on short-term effects, exploring the correlation between the companies environmental and social performance and their market performance based on the credibility of the disclosed information.

The findings reveal that a higher level of credibility in environmental reports negatively impacted the relationship between environmental performance and market performance. In contrast, the credibility of social reports positively influenced the relationship between social performance and market performance. These results suggest that in Brazil, the companies' environmentally responsible profile is still underdeveloped, while social concerns have become more prominent, reflecting the various vulnerabilities that affect the Brazilian society.

With the expectation that future changes in the profile of Brazilian companies will be driven by new legal requirements for sustainability reporting and the need to reduce distrust surrounding the disclosure of information on environmental and social actions, we underscore the importance of credibility in corporate communication. It is a critical factor in the corporations' development and sustainability. In this context, the theory of communicative action is particularly relevant. It underscores communicative rationality to achieve consensus among stakeholders, in contrast to instrumental rationality, which focuses on self-interest without regard for the surrounding reality. The limitations of this study are mainly associated with spatial factors, as the research was focused exclusively on Brazil, which presents a unique characteristic: the absence of a legal requirement for the disclosure of sustainability reports. This reduced the sample size, as many companies listed on the B3 (Brazilian Stock Exchange) do not publish sustainability reports or do so inconsistently. The temporal scope (2014–2019) also constituted a limiting factor, as the study aimed to analyze short-term effects.

The methodology involved examining sustainability reports published consistently from 2014 to 2018 and assessing the impact of such disclosures on market performance in subsequent periods from 2015 to 2019. Consequently, the short analysis time may have affected the robustness of the results.

As this study evaluated the credibility of sustainability reports using an automated approach, we recommend that future research explore credibility from the consumers' and investors' perspectives in various global contexts. This would provide a more comprehensive understanding of the impact of corporate communication on public perception.

CRediT authorship contribution statement

Gleice C. de L. Moreno: Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Marco P.M. de Souza:** Writing – review & editing, Software. **Nelson Hein:** Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Biagio Fernando Giannetti:** Investigation.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used A.I. assistance to check for spelling errors and the readability of the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and assumed full responsibility for the publication.

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Ethics statement

Ethical approval is not applicable to this manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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