

O que explica a divulgação ESG? Um estudo com empresas brasileiras listadas na B3

What explains ESG disclosure? a study of brazilian companies listed on the B3

¿Qué explica la divulgación ESG? Un estudio con empresas brasileñas listadas en la B3

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Resumo: O objetivo deste estudo é investigar se fatores financeiros (rentabilidade e endividamento), estruturais (tamanho e idade) e de mercado (valor de mercado e quantidade de ações em circulação) são capazes de discriminar o nível de divulgação ESG das empresas brasileiras listadas na B3. Para isso, foi realizada uma pesquisa quantitativa, com aplicação da técnica estatística de análise discriminante, utilizando dados de uma amostra composta por 103 companhias não financeiras, extraídos da base LSEG *Data and Analytics* referentes ao ano de 2023. Os resultados indicam que o valor de mercado, o porte da empresa e o volume de ações em circulação são variáveis que discriminam significativamente os níveis de transparência ESG, enquanto a rentabilidade, a alavancagem financeira e a idade da empresa não apresentaram influência estatisticamente relevante. A análise dos pilares ESG de forma separada confirmou a predominância dos fatores estruturais e mercadológicos, especialmente na divulgação ambiental e social. Conclui-se que a transparência ESG está mais associada à visibilidade de mercado e às pressões regulatórias do que ao desempenho financeiro, o que reforça a importância de fatores externos para a consolidação das práticas sustentáveis nas empresas brasileiras de capital aberto.

Palavras-chave: Divulgação ESG. Análise discriminante. Mercado Financeiro.

Abstract: The objective of this study is to investigate whether financial factors (profitability and indebtedness), structural factors (size and age), and market factors (market value and shares outstanding) can discriminate the ESG disclosure level of Brazilian companies listed on the B3. To this end, a quantitative study was conducted by applying the statistical technique of discriminant analysis to data from a sample of 103 non-financial companies, extracted from the LSEG *Data and Analytics* database for the year 2023. The results indicate that market value, company size, and shares outstanding are variables that significantly discriminate ESG transparency levels, while profitability, financial leverage, and company age did not show a statistically significant influence. The analysis of the individual ESG pillars confirmed the predominance of structural and market factors, especially for environmental and social disclosure. The study concludes that ESG transparency is more associated with market visibility and regulatory pressures than with financial performance, which reinforces the importance of external factors in the consolidation of sustainable practices among Brazilian publicly listed companies.

Keywords: ESG Disclosure. Discriminant Analysis. Financial Market.

Resumen: El objetivo de este estudio es investigar si los factores financieros (rentabilidad y endeudamiento), estructurales (tamaño y edad) y de mercado (valor de mercado y cantidad de acciones en circulación) son capaces de discriminar el nivel de divulgación ESG de las empresas brasileñas cotizadas en la B3. Para ello, se realizó una investigación cuantitativa, aplicando la técnica estadística de análisis discriminante, utilizando datos de una muestra compuesta por 103 empresas no financieras, extraídos de la base LSEG Data and Analytics correspondientes al año 2023. Los resultados indican que el valor de mercado, el tamaño de la empresa y el volumen de acciones en circulación son variables que discriminan significativamente los niveles de transparencia ESG, mientras que la rentabilidad, el apalancamiento financiero y la edad de la empresa no presentaron una influencia estadísticamente relevante. El análisis de los pilares ESG de forma separada confirmó el predominio de los factores estructurales y de mercado, especialmente en la divulgación ambiental y social. Se concluye que la transparencia ESG está más asociada a la visibilidad de mercado y a las presiones regulatorias que al desempeño financiero, lo que refuerza la importancia de los factores externos para la consolidación de las prácticas sostenibles en las empresas brasileñas de capital abierto.

Palabras clave: Divulgación ESG. Análisis discriminante. Mercado financiero.

Introduction

In recent years, ESG (Environmental, Social, and Governance) agenda has become increasingly relevant for companies worldwide. Regulatory pressures, investor expectations, and growing concerns regarding sustainability have driven organizations to adopt more transparent and responsible practices (Yu et al., 2024). The disclosure of such information has become essential for corporate management, influencing market and societal perceptions regarding firms' reliability and commitment to sustainable practices (Liu et al., 2023). In Brazil, this trend is particularly evident among companies listed on B3, the Brazilian stock exchange, where the publication of ESG reports is a mechanism to strengthen stakeholder trust and mitigate reputational risks (Barba et al., 2024; Silva & Mascena, 2024).

Despite the growing dissemination of ESG practices, uncertainties remain regarding the factors that effectively drive such transparency in the Brazilian context. International studies suggest that factors such as firm size, profitability, governance structure, and existing regulatory frameworks are key determinants of ESG disclosure practices (Bagh et al., 2024; Rau & Yu, 2024). In Brazil, however, some studies indicate characteristics such as industry sector, liquidity, and the presence of institutional investors also play a significant role in explaining ESG disclosure levels (Silveira et al., 2025).

Given this context, the following research question emerges: which financial, structural, and market-related factors are capable of discriminating the level of ESG disclosure among non-financial Brazilian companies listed on B3? Based on this question, the objective of this study is to investigate whether financial factors (profitability and leverage), structural factors (firm size and age), and market-related factors (market value and the number of outstanding shares) are capable of discriminating the level of ESG disclosure among Brazilian companies listed on B3. Therefore, this study seeks to contribute to a better understanding of the factors which drive ESG disclosure practices and to provide useful insights for academics, regulators, and managers interested in enhancing corporate sustainability strategies.

This research is associated with the growing impact of ESG disclosure practices on firms' financial performance and corporate reputation, as evidenced by the increasing levels of environmental disclosure identified in the recent literature. With the intensification of regulatory requirements and stakeholder pressure for greater transparency, understanding the determinants that motivate firms to

disclose ESG information is essential to support strategic decision-making and guide public policy development (Wang & Hou, 2024; Wang et al., 2023).

Furthermore, this study contributes to the academic literature by addressing a highly relevant topic within the Brazilian context. Recent studies emphasize the need to investigate ESG disclosure practices in emerging economies, given that most existing research remains concentrated in developed markets. Consequently, there is a significant research gap concerning studies focused on emerging countries, particularly within the Brazilian context.

Theoretical Foundations of the Research

Theories Associated with ESG

The disclosure of Environmental, Social, and Governance (ESG) practices by Brazilian companies listed on B3 can be analyzed from different theoretical perspectives. Among these, Signaling Theory and Legitimacy Theory stand out as important approaches for understanding the strategic incentives underlying these initiatives and their implications for the financial market.

Signaling Theory, proposed by Spence (1978), explains how companies use strategic information to reduce information asymmetry between firms and investors. In the context of ESG disclosure, this theory suggests companies using and disclosing sustainability and governance practices send positive signals to the market, reinforcing their commitment to transparency and corporate responsibility. For investors, these signals may indicate lower financial risk and greater operational resilience, making such firms more attractive for capital allocation decisions (Andreas & Topanotti, 2024).

Furthermore, higher levels of ESG disclosure are associated with more effective investor relations management, suggesting that transparency in these areas may strengthen investor confidence and enhance corporate reputation (Liang & Cao, 2024). In Brazil, this movement has become increasingly evident, particularly among nonfinancial companies listed on B3 that seek to attract institutional and foreign investors. Therefore, by adopting and disclosing ESG practices, firms differentiate themselves in the market, influencing their financial valuation and the interest of multiple stakeholders.

Legitimacy Theory (Suchman, 1995) is grounded in the premise that companies must align with social and institutional expectations to ensure their acceptance and continuity within the market. Based on this theoretical perspective, in the Brazilian context, where environmental and social challenges are frequently debated, ESG practices may be understood as mechanisms for strengthening corporate reputation and organizational legitimacy before society and stakeholders.

The market demonstrates substantial and significant appreciation for the environmental practices used by firms operating outside environmentally sensitive industries. Conversely, for companies operating in environmentally sensitive sectors, such as mining, oil, and agribusiness, market valuation is primarily associated with social and corporate governance practices, highlighting the importance of ESG strategies aligned with the specific characteristics of each industry (Kisata et al., 2024).

Moreover, this theory suggests reassurance from institutional investors, regulators, and consumers may lead firms to reinforce their ESG policies, even when such initiatives are driven more by external necessity than by genuine organizational commitment (Meyer & Rowan, 1977). From this perspective, within the Brazilian context, this dynamic can be observed in the requirements imposed by Brazilian

Securities and Exchange Commission (CVM) and B3, both of which have intensified demands for greater transparency and commitment regarding ESG disclosure practices among listed companies.

Therefore, the advancement of ESG disclosure practices can be understood both as a market signaling strategy, highlighting firms perceived as more solid and transparent, and as an instrument of institutional legitimization aimed at meeting regulatory and societal expectations. These two theoretical approaches are complementary and help explain why publicly traded Brazilian companies are increasingly investing in the ESG agenda.

Firm Attributes and ESG Disclosure

The adoption and disclosure of Environmental, Social, and Governance (ESG) practices may be influenced by several organizational attributes. Factors such as firm size, age, profitability, capital structure, ownership dispersion, and geographic location play a relevant role in corporate transparency and in the manner through which firms commit to the ESG agenda (Andreas & Topanotti, 2024; Kisata et al., 2024; Liang & Cao, 2024; Wang & Hou, 2024).

Within the Brazilian context, understanding these characteristics makes it possible to identify how firms differ regarding ESG disclosure levels, categorized as insufficient, moderate, above average, and high.

Profitability may also be associated with the level of ESG disclosure, since more profitable firms possess greater capacity to invest in sustainability and governance practices (Rao et al., 2023). Indicators such as Return on Equity (ROE) are widely used to measure financial performance and may represent important determinants of ESG disclosure (Andreas & Topanotti, 2024). In Brazil, studies suggest that highly profitable companies frequently rank among those with the highest levels of ESG disclosure, indicating that this variable may be useful in differentiating firms according to their ESG disclosure practices.

Financial leverage may also constitute an influential factor. Highly leveraged firms may present lower financial flexibility to invest in sustainability initiatives, which can result in lower levels of ESG disclosure (Jensen & Meckling, 1976). Conversely, some firms use ESG practices as a competitive advantage to attract investors and reduce financing risks (Flammer, 2013), which may affect their position regarding ESG transparency.

Large firms tend to demonstrate greater transparency and stronger commitment to ESG disclosure, since they are more exposed to regulatory requirements and market pressures (Putri & Puspawati, 2023). Studies indicate larger companies possess greater financial resources and organizational structures to implement ESG practices, while also being subject to increased scrutiny from institutional investors and regulatory bodies (Indana et al., 2024).

Firm age may also influence the degree of ESG engagement. Older firms, due to their consolidated governance structures and greater experience in adapting to regulatory and social demands, tend to present more structured ESG disclosure practices (Junius et al., 2020). However, younger firms may be more agile and innovative in implementing ESG practices, seeking to differentiate themselves in the market and attract investors interested in sustainability (Rao et al., 2023). Therefore, firm age may represent a relevant factor in distinguishing companies according to their level of ESG transparency.

Market value reflects investors' perceptions regarding the company and may be associated with the degree of ESG transparency. Firms with high market capitalization tend to be more visible and, therefore, possess greater incentives to adopt and disclose ESG practices (Kisata et al., 2024). In this

context, market value may represent a relevant attribute in differentiating ESG disclosure levels, as more highly valued firms frequently demonstrate greater commitment to corporate transparency and sustainable practices.

Companies with greater ownership dispersion (free float) tend to present higher levels of ESG disclosure, since they are subject to stronger pressure from institutional investors, who frequently prioritize transparency and responsible governance practices (Kuzey et al., 2023). Therefore, the percentage of outstanding shares may constitute a discriminating factor between firms that disclose higher or lower levels of ESG information.

Methodological Elements of the Research

The methodology adopted in this study is characterized as quantitative, as it is based on the analysis of numerical data and employs statistical techniques to explore patterns and identify relationships among variables (Prodanov & Freitas, 2013). Regarding its nature, this research is classified as descriptive, since it seeks to understand and detail the profiles of publicly traded Brazilian companies based on their ESG performance. In this sense, the study describes the characteristics of specific phenomena (Gil, 2023). The research is also classified as documentary, as it uses secondary data extracted from reliable sources, such as LSEG Data and Analytics reports and other consolidated databases (Marconi et al., 2003).

Data analysis was conducted using Stata software, which was employed for the statistical treatment of the information and for the application of discriminant analysis. Initially, the data were organized and processed in Stata, enabling variable verification and the generation of statistical results. Subsequently, the outputs generated were exported to Microsoft Excel, which was used for the complementary organization of tables and for the structured presentation of the results in the study.

Sample and Data Source

The sample of this study consists of 103 companies listed on B3, Brazil's stock exchange, with data referring to the year 2023. To ensure consistency and comparability of the information, companies from the financial sector were excluded due to their specific accounting and regulatory characteristics, which could compromise the homogeneity of the analysis.

In addition, companies that did not disclose information regarding ESG disclosure levels and their respective pillars (Environmental, Social, and Governance) were excluded, since transparency in the disclosure of such data is essential for the classification and evaluation of environmental, social, and governance practices. Therefore, the final sample comprises nonfinancial companies whose ESG disclosure levels and related pillars (Environmental, Social, and Governance) were properly reported.

Data collection was conducted using the LSEG Data and Analytics and Economatica databases, which provide detailed information regarding ESG indicators and financial attributes of the companies analyzed.

Statistical Model and Definition of Variables

To achieve the objective of the study, the investigation was conducted through discriminant analysis, which was used to identify which financial characteristics (profitability and leverage), structural characteristics (firm size and age), and market characteristics (firm value and number of

shares) of companies listed on B3 contribute to differentiating them according to their ESG transparency levels.

Discriminant analysis is a multivariate statistical technique applied when the objective is to classify observations into previously defined groups while maximizing the differences among them (Hair et al., 2009). This method is widely used in economic and financial research because it enables the identification of which independent variables most strongly influence the separation among the analyzed groups (Mingoti, 2005). In the context of this study, this technique made it possible to verify which financial and structural attributes are associated with different levels of ESG transparency.

Table 1 presents the dependent and independent variables used in this study.

Table 1 - **Dependent and Independent Variables**

	Variable	Concept	Reference
Dependent Variables	ESG Disclosure Level	Represents the overall level of transparency in the disclosure of environmental, social, and governance practices by firms.	LSEG
	Environmental Disclosure Level	Indicates the degree of disclosure of information related to environmental practices.	LSEG
	Social Disclosure Level	Reflects the level of transparency in the disclosure of social aspects.	LSEG
	Governance Disclosure Level	Measures the level of disclosure of corporate governance practices.	LSEG
Independent Variables	Return on Equity (ROE)	$\frac{\text{Net profit}}{\text{Net worth}}$	(Damodaran, 2012)
	Financial Leverage	$\frac{\text{Total debt}}{\text{Net worth}}$	(Brealey et al., 2011)
	Size	Total active log	(Penman, 2010)
	Age	Represents the length of time the company has been in operation, measured in years since its foundation.	(Berger & Gregory, 1998)
	Market Value	Share Price x Number of Shares	(Penman, 2010)
	Outstanding Shares	Total issued shares – repurchased shares	(Claessens et al., 2000)

Source: Prepared by the authors (2024).

This study employed Fisher's Linear Discriminant Analysis (LDA), which is a statistical method designed to identify a linear combination of independent variables that best classifies observations into the groups of the dependent variable by minimizing within group variance and maximizing between group variance (Fisher, 1936).

The ESG indicator used in this study was obtained from the LSEG Data & Analytics database and consists of a score ranging from 0 to 100 points. This indicator measures the level of transparency and disclosure of firms' environmental, social, and corporate governance practices by considering the extent and quality of publicly disclosed ESG information. Therefore, the higher the score, the greater the company's level of ESG disclosure.

The companies were classified into four groups according to their ESG disclosure scores, as presented in Table 2.

Table 2 - Study Groups

ESG Level	Score Range	Description
Insufficient	0 a 25	Scores within this range indicate an insufficient level of transparency in the public disclosure of relevant information.
Moderate	> 25 a 50	Scores within this range indicate a moderate level of transparency in the public disclosure of relevant information.
Above average	> 50 a 75	Scores within this range indicate an above average level of transparency in the public disclosure of relevant information.
High	> 75 a 100	Scores within this range indicate a high level of transparency in the public disclosure of relevant information

Source: Adapted from LSEG Data & Analytics (2024).

Although LSEG provides a continuous ESG score, the classification of companies into the groups “insufficient,” “moderate,” “above average,” and “high” was defined by the authors of this study based on the score ranges of the indicator. This categorization was adopted to facilitate the operationalization of the discriminant analysis and to enable comparisons across different levels of ESG disclosure.

With the characterization of the sample, the definition of the variables, and the description of the statistical model, this methodological stage is concluded. The methodological choices adopted seek to ensure the consistency of the analysis and the reliability of the results. The following section presents the research findings, focusing on the identification of the factors that most strongly influence ESG disclosure practices among Brazilian companies listed on B3.

Results and discussion

This section presents the results of the research based on the analysis of 103 non-financial companies listed on B3. The data are organized to demonstrate the profile of the companies according to their ESG disclosure levels and to identify which variables contribute to differentiating them. The analysis is divided into the overall ESG disclosure level and the three pillars (environmental, social, and governance), combining descriptive statistics and statistical tests to highlight the main observed patterns.

Overall ESG disclosure level and ESG pillars: company profile

To describe the profile of firms across the different ESG disclosure levels and ESG pillars, descriptive statistical analysis of the investigated variables was initially conducted. Measures such as mean, minim, and maximum value were examined to characterize the profile of companies classified into the insufficient, moderate, above average, and high categories. Descriptive statistics contribute to a preliminary understanding of the sample characteristics and of the differences among the analyzed groups (Fávero & Belfiore, 2017).

Table 3 presents the descriptive statistics of the groups of companies according to their ESG disclosure levels, enabling the identification of patterns among the analyzed attributes (age, profitability, leverage, market value, number of shares, and firm size) and the level of ESG disclosure.

Table 3 - Descriptive Statistics by ESG Disclosure Level Group

ESG Level		ESG Disclosure	Age	ROE	Financial Leverage	Market Value	Outstanding Shares	Size
Insufficient	Mean	15.21	30.66	3.08	1.02	14.77	12.5	15.64
	Min.	1.13	13	-75.14	-19.08	10.46	9.89	13.2
	Max.	24.5	61	37.32	22.46	17.46	14.56	18.34
Moderate	Mean	38.82	44.22	8.84	1.16	15.44	13.1	16.35
	Min.	25.55	10	-50.1	-5.5	13.39	11.05	14.74
	Max.	48.18	117	81.92	8.14	17.32	15.82	18.1
Above average	Mean	60.89	40.63	5.91	2.58	16.55	13.88	17.45
	Min.	50.14	4	-149.13	-22.83	12.89	11.87	14.58
	Max.	72.98	124	36.86	91.82	19.19	16.57	19.14
High	Mean	82.81	52.64	15.34	1.32	17.38	14.2	17.72
	Min.	77.17	23	-11.9	-7.18	15.69	13.2	15.36
	Max.	91.92	90	34.93	5.42	20.01	16.37	20.77
Overall	Mean	51.43	41.75	7.69	1.8	16.11	13.52	16.93
	Min.	1.138	4	-149.13	-22.83	10.46	9.89	13.2
	Max.	91.92	124	81.92	91.82	20.019	16.57	20.77

Source: Prepared by the authors (2024).

Companies classified in the “high” group, for instance, present the highest mean values across virtually all analyzed variables, particularly regarding ROE, firm age, and market value. In contrast, “insufficient” and “moderate” groups exhibit lower average values for these same variables.

It is also possible to observe that companies in the “above average” group present the highest mean level of financial leverage among all groups, indicating heterogeneity in organizational profiles with respect to capital structure, regardless of the ESG disclosure level.

Although these data do not allow conclusions regarding cause-and-effect relationships, they provide an overview of the profiles of companies within each disclosure category.

Regarding the Environmental pillar, the results are presented in Table 4. The findings indicate that environmental disclosure levels tend to be higher among larger firms, companies with greater market value, and firms with stronger participation in the financial market, rather than being associated with financial performance or firm age.

The relationship between firm age and the level of Environmental disclosure does not follow a linear pattern, since the moderate group presents the highest average age. This finding suggests that older firms do not necessarily exhibit higher levels of environmental disclosure, whereas younger companies may stand out when they use ESG oriented strategies from an early stage.

Profitability (ROE) also does not present a clear pattern. Although companies with higher levels of environmental disclosure demonstrate higher average ROE compared to firms with lower disclosure levels, the data reveal substantial variation within the groups, indicating that high profitability does not necessarily imply greater investment in sustainability practices.

Table 4 - Descriptive Statistics by Environmental Disclosure Level Group

E. Disclosure Level		E. Disclosure	Age	ROE	Financial Leverage	Market Value	Outstanding Shares	Size
Insufficient	Mean	9.22	30.33	4.39	1.00	15.14	12.90	15.99
	Min.	0	10	-75.14	-19.08	10.46	9.89	13.20
	Max.	24.50	67	37.32	22.46	18.48	16.15	18.75
Moderate	Mean	38.27	48.28	5.21	-0.25	15.84	13.43	16.74
	Min.	26.26	14	-50.10	-22.83	12.89	11.51	15.22
	Max.	49.02	117	22.59	3.93	18.02	15.71	18.45
Above average	Mean	61.78	44.24	8.29	3.82	16.33	13.54	17.16
	Min.	51.16	4	-149.13	-5.50	13.82	11.76	14.58
	Max.	74.89	124	81.92	91.82	20.01	16.37	20.77
High	Mean	83.49	43.82	13.51	0.73	17.30	14.47	17.96
	Min.	75.12	17	-14.54	-9.61	15.69	13.20	16.26
	Max.	93.98	90	34.93	5.42	19.62	16.57	19.93
Overall	Mean	48.32	41.75	7.69	1.80	16.11	13.52	16.93
	Min.	0	4	-149.13	-22.83	10.46	9.89	13.20
	Max.	93.98	124	81.92	91.82	20.01	16.57	20.77

Source: Prepared by the authors (2024).

Financial leverage also does not follow a single trend. The “above average” level presents the highest leverage, whereas companies classified in the “high” level, which exhibit the highest environmental disclosure, present, on average, more moderate indebtedness. This behavior suggests that some firms may use ESG agenda as a strategy to attract investors and improve corporate image, while others do not prioritize this approach.

On the other hand, market value, ownership dispersion, and firm size demonstrate a more consistent discriminating capacity regarding the environmental score. Firms with higher market value and greater exposure to the financial market tend to disclose more information concerning their environmental practices.

Overall, the results indicate that companies with higher levels of environmental disclosure are predominantly large firms with high market value and strong participation in the financial market. In contrast, factors such as firm age, profitability, and financial leverage appear to exert limited influence on environmental transparency. This finding suggests that the adoption of environmental practices is more strongly associated with the need to provide accountability to investors and the market than with a direct relationship to firms’ financial health or longevity.

With respect to social disclosure, Table 5 presents the descriptive statistics. The results indicate that companies with higher levels of social disclosure tend, on average, to have longer market presence, higher return on equity (ROE), and larger organizational size.

Companies classified in “high” level present the highest average age and profitability among all groups. This may indicate that older firms possess greater maturity in adopting structured social practices. However, this difference may also be associated with other factors, such as industry sector or corporate governance characteristics, which were not considered in the analysis.

Table 5 - Descriptive Statistics by Social Disclosure Level Group

S. Disclosure Level		S. Disclosure	Age	ROE	Financial Leverage	Market Value	Outstanding Shares	Size
Insufficient	Mean	9.18	33.53	1.39	0.69	15.08	12.89	15.98
	Min.	0.61	13	-75.14	-19.08	10.46	11.26	13.41
	Max.	23.98	67	37.32	22.46	17.46	15.71	18.34
Moderate	Mean	40.08	44.55	10.62	1.46	15.34	12.94	16.17
	Min.	25.11	10	-50.10	-5.50	11.28	9.89	13.20
	Max.	49.84	117	81.92	8.14	17.32	15.82	18.10
Above average	Mean	62.43	38.62	3.97	2.49	16.40	13.74	17.35
	Min.	51.45	4	-149.13	-22.83	12.89	11.29	14.58
	Max.	74.96	89	36.86	91.82	19.19	16.57	19.14
High	Mean	84.89	51.33	16.72	1.42	17.30	14.29	17.72
	Min.	75.15	17	-11.94	-7.18	15.69	13.20	15.36
	Max.	96.50	124	34.93	5.42	20.01	16.37	20.77
Overall	Mean	53.77	41.75	7.69	1.80	16.11	13.52	16.93
	Min.	0.611	4	-149.13	-22.83	10.46	9.89	13.20
	Max.	96.50	124	81.92	91.82	20.01	16.57	20.77

Source: Prepared by the authors (2024).

When market value is considered, the group with the highest social scores presents, on average, the highest market value, which may indicate that companies with higher social scores tend to be more highly capitalized.

Regarding governance disclosure, Table 6 presents the descriptive statistics.

Table 6 - Descriptive Statistics by Governance Disclosure Level Group

G. Disclosure Level		G. Disclosure	Age	ROE	Financial Leverage	Market Value	Outstanding Shares	Size
Insufficient	Mean	16.53	45.63	10.74	0.97	15.18	13.02	16.07
	Min.	1.46	19	-17.20	-1.29	10.46	11.26	13.42
	Max.	24.97	83	81.93	3.72	17.32	15.83	18.35
Moderate	Mean	37.51	36.61	7.65	0.83	15.82	13.38	16.55
	Min.	26.15	10	-75.15	-19.09	11.28	9.89	13.20
	Max.	49.37	117	59.97	22.46	19.19	16.57	18.70
Above average	Mean	63.69	48	2.44	3.63	16.29	13.64	17.27
	Min.	50.01	14	-149.13	-22.83	12.89	11.92	15.91
	Max.	74.63	124	32.86	91.82	18.86	15.25	18.33
High	Mean	82.78	38.71	12.35	1.61	17.08	14.01	17.79
	Min.	75.33	4	-11.95	-7.19	13.40	11.05	15.32
	Max.	92.75	90	34.93	6.89	20.02	16.38	20.77
Overall	Mean	51.11	41.76	7.70	1.81	16.12	13.53	16.94
	Min.	1.46	4	-149.13	-22.83	10.46	9.89	13.20
	Max.	92.75	124	81.93	91.82	20.02	16.57	20.77

Source: Prepared by the authors (2024).

The results indicate that corporate governance is associated with firm size and the manner in

which companies structure their capital. Larger firms and companies with greater market recognition tend to present higher levels of governance, suggesting that transparency and the adoption of good governance practices are more prevalent among organizations with greater visibility and accountability toward investors and other stakeholders.

Furthermore, companies with more developed governance structures tend to demonstrate greater financial stability and lower exposure to risk, whereas firms with lower governance levels exhibit greater variation in their results, which may indicate managerial fragility. These findings reinforce the relevance of corporate governance not only as a competitive advantage but also as an important factor for corporate sustainability and long-term growth.

Discriminating Factors of Overall ESG Disclosure Level and ESG Pillars

In order to identify which financial, structural, and market related attributes best discriminate the different ESG disclosure levels of the analyzed companies, Fisher's Linear Discriminant Analysis (Linear Discriminant Analysis – LDA) was employed. This multivariate technique is used to identify which financial, structural, and market attributes best discriminate the different ESG disclosure levels among the analyzed firms (Mingoti, 2005).

Table 7 presents the results of the discriminant analysis applied to the overall ESG disclosure level and to environmental, social, and governance pillars.

Table 7 - **Factors that differentiate overall and pillar-specific ESG disclosure levels**

Variables	ESG		Environmental		Social		Governance	
	F	Pr > F	F	Pr > F	F	Pr > F	F	Pr > F
Age	1.81	0.1500	2.23	0.0800	1.63	0.1800	1.63	0.1800
Return on Equity (ROE)	0.66	0.5700	0.49	0.6800	1.47	0.2200	0.7	0.5500
Financial Leverage	0.32	0.8000	0.7	0.5400	0.26	0.8500	0.88	0.4500
Market Value	13.72	0.0000	6.99	0.0000	10.29	0.0000	5.82	0.0000
Outstanding Shares	7.99	0.0000	5.94	0.0000	6.58	0.0000	2.05	0.1100
Size	12.18	0.0000	8.48	0.0000	10.12	0.0000	7.39	0.0000

Source: Prepared by the authors (2024).

The results indicate that, for the overall ESG disclosure level, the variables market value, outstanding shares, and firm size presented statistical significance, indicating a greater capacity to discriminate among the groups classified according to different ESG disclosure levels. Conversely, firm age, return on equity, and financial leverage did not present statistical significance, suggesting lower discriminating capacity among the analyzed groups.

These findings indicate that companies classified at different ESG disclosure levels tend to exhibit more evident distinctions in attributes related to organizational structure and participation in the financial market. The results are consistent with the studies of Barbosa and Klann (2023) and Macedo et al. (2022), which emphasize the relevance of market value in ESG disclosure practices. Complementarily, Mainardi et al. (2024) demonstrate that larger firms tend to present lower levels of information asymmetry regarding ESG disclosure.

The findings reinforce that ESG disclosure does not depend exclusively on firms' financial condition, but rather on their market context and the pressure exerted by different stakeholders. Larger firms, companies with higher market value, and organizations with a greater number of shareholders tend to disclose more ESG information, either due to regulatory requirements or the need to maintain

a favorable image in the market. At the same time, the absence of significant effects for profitability and leverage suggests that ESG engagement may be more strategic in nature than directly associated with firms' financial strength. In other words, ESG transparency may be more strongly related to corporate visibility and market pressure than to a spontaneous commitment to sustainability.

Regarding environmental disclosure, the results of the discriminant analysis indicate that firm size, market value, and outstanding shares presented greater discriminating capacity among the groups classified according to environmental disclosure levels. In contrast, firm age, profitability, and financial leverage did not present statistical significance.

These findings suggest that the differences observed among the environmental disclosure groups are more strongly associated with firms' structural and market related attributes than with financial characteristics. The results corroborate the findings of Solikhah et al. (2021), who identified greater prominence of larger firms in environmental disclosure practices, as well as Amosh and Khatib (2024), who highlighted the relevance of market dynamics in the valuation of corporate environmental practices.

Regarding the Social pillar, market value and outstanding shares demonstrated greater discriminating power among the analyzed groups. The variables firm age, profitability, and financial leverage did not present statistically significant differences.

Therefore, the results indicate that firms classified at different levels of social disclosure tend to differ primarily in aspects related to organizational size and participation in the financial market. These findings reinforce the literature emphasizing the influence of market exposure and stakeholder pressure on corporate transparency practices (Kuzey et al., 2023).

Concerning the Governance pillar, the results revealed that market value and firm size were the only variables presenting statistical significance. The remaining variables did not demonstrate significant discriminating capacity among the groups classified according to governance disclosure levels. These findings indicate that firms classified at different governance disclosure levels tend to exhibit more evident distinctions in structural and market related attributes, reinforcing the relevance of organizational size and corporate visibility in differentiating the analyzed groups.

Overall, market value and firm size were the only variables that remained statistically significant across all ESG pillars as well as for the overall ESG disclosure level. Furthermore, outstanding shares demonstrated significant discriminating capacity in the Environmental and Social pillars. In contrast, firm age, return on equity, and financial leverage did not present statistical significance in any of the analyzed dimensions.

From the perspective of Signaling Theory, the results suggest that firms with larger size, higher market value, and greater ownership dispersion tend to position themselves within groups characterized by higher ESG disclosure levels, using corporate transparency as a signaling mechanism to the market (Spence, 1978).

From the perspective of Legitimacy Theory, the findings also indicate that firms with greater exposure to the market and stakeholders tend to demonstrate stronger commitment to ESG disclosure, possibly due to the institutional and regulatory pressures to which they are subjected (Suchman, 1995).

Final Considerations

This study aimed to identify the factors capable of discriminating the ESG disclosure levels of Brazilian companies listed on B3 by considering financial, structural, and market related attributes. To achieve this objective, Fisher's Linear Discriminant Analysis (Linear Discriminant Analysis – LDA)

was employed, enabling the identification of the variables with the greatest capacity to differentiate companies classified at distinct ESG disclosure levels.

The results revealed that structural and market related variables presented greater discriminating power among the analyzed groups. In particular, market value, firm size, and the number of outstanding shares were the attributes that most effectively differentiated ESG disclosure levels. In contrast, variables traditionally associated with financial performance, such as profitability, financial leverage, and firm age, did not demonstrate statistically significant relevance in distinguishing the groups.

The analysis of environmental, social, and governance pillars confirmed the predominance of structural and market related factors in discriminating the different ESG disclosure levels. The findings indicated that companies classified at higher levels of environmental and social disclosure tend to present larger organizational size, higher market value, and greater ownership dispersion. In the case of corporate governance, organizational size and market value emerged as the most relevant discriminating factors.

The findings suggest ESG disclosure, within the context of Brazilian companies listed on B3, is more strongly associated with organizational visibility, market exposure, and institutional pressures than with firms' financial performance itself. From the perspective of Signaling Theory, larger firms, companies with higher market value, and firms with greater ownership dispersion tend to use ESG disclosure as a mechanism to reduce information asymmetry and strengthen corporate reputation before investors and stakeholders. Complementarily, Legitimacy Theory contributes to understanding that companies more exposed to the market and public scrutiny tend to expand their ESG transparency practices in response to regulatory, social, and institutional pressures.

Furthermore, the results reinforce the importance of the institutional and sectoral context in understanding ESG disclosure practices among Brazilian companies. Although this study did not conduct a specific analysis by economic sector, it is important to recognize that certain industries are more exposed to environmental, social, and regulatory pressures, which may influence ESG transparency levels. Companies operating in environmentally sensitive sectors, such as energy, mining, oil, and agribusiness, tend to face greater pressure from investors, regulators, and society, which may result in different ESG disclosure levels when compared to firms operating in less exposed industries.

From a theoretical perspective, this study contributes to the literature by expanding empirical evidence regarding the discriminating factors of ESG disclosure within the Brazilian context, particularly through the use of discriminant analysis, a technique that remains underexplored in national ESG studies. Moreover, the findings reinforce the assumptions of Signaling Theory and Legitimacy Theory by demonstrating that structural and market related factors possess greater capacity to discriminate ESG disclosure levels among the analyzed firms.

In practical terms, the findings may assist regulators, investors, and corporate managers. For regulators, the results provide evidence that may contribute to the improvement of policies aimed at enhancing transparency and ESG disclosure in the Brazilian market. For investors, the findings contribute to a better understanding of the corporate characteristics that differentiate firms with higher ESG transparency levels. For managers, the study highlights the importance of aligning ESG practices with the institutional, regulatory, and market demands of the environment in which organizations operate.

As a limitation, this study considered only nonfinancial Brazilian companies listed on B3 and utilized data referring to a single time period. In addition, the absence of a more in depth sectoral

analysis limits the understanding of possible differences among economic sectors regarding ESG disclosure levels.

Finally, future research is encouraged to expand the scope of analysis through the incorporation of sectoral, institutional, and longitudinal variables, as well as through the application of complementary statistical methods, such as logistic regression, cluster analysis, and panel data models. Future studies may also conduct comparative analyses between emerging and developed markets, in addition to including privately held firms, with the objective of deepening the understanding of the factors associated with ESG disclosure practices.

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