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Relationship between economic and financial performance and ESG practices in brazilian companies

Relación entre el desempeño económico y financiero y las prácticas de ESG en empresas brasileñas

Relação entre o desempenho econômico e financeiro e as práticas de ESG em empresas brasileiras

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Abstract

Objective: The objective of this study is to analyze the relationship between economic-financial performance and ESG practices in Brazilian companies listed on B3.

Methodology: The study is descriptive research with a quantitative approach, conducted through documental procedures. Data were collected from companies listed on B3 between 2018 and 2022, and panel data regression was used for analysis.

Results: The results indicate that Return on Assets (ROA), Return on Equity (ROE), and Indebtedness (DEB) did not show a statistically significant influence on ESG practices. In contrast, Company Size (S) positively influences ESG practices, and Liquidity (LIQ) negatively influences them, with both relationships being statistically significant. The control variable Covid (COVID) showed a negative influence, but without statistical significance. These findings highlight the complexity and contextual dependence of the relationship between corporate characteristics and the adoption of ESG practices.

Contributions of the Study: The study contributes by demonstrating that traditional financial metrics (ROA and ROE) do not effectively predict investment in ESG practices in Brazilian companies. It reveals the complexity of corporate decision-making, where liquidity acts negatively and size positively. This suggests that ESG practices are influenced by multiple factors beyond immediate financial performance, demanding a more holistic approach to sustainability.

Keywords: ESG. Economic performance. Sustainability. Brazilian companies.

Resumen

Objetivo: El objetivo de este estudio es analizar la relación entre el desempeño económico-financiero y las prácticas de ESG en empresas brasileñas que cotizan en B3.

Metodología: Se trata de una investigación descriptiva con enfoque cuantitativo, realizada a través de procedimientos documentales. Los datos fueron recolectados de empresas que cotizan en B3 entre 2018 y 2022, utilizando la técnica de regresión de datos de panel para el análisis.

Resultados: Los resultados indican que el Retorno sobre Activos (ROA), el Retorno sobre el Patrimonio Neto (ROE) y el Endeudamiento (END) no mostraron una influencia estadísticamente significativa en las prácticas ESG. En contraste, el Tamaño (TAM) de la

empresa influye positivamente en las prácticas ESG, y la Liquidez (LIQ) las influye negativamente, siendo ambas relaciones estadísticamente significativas. La variable de control Covid (COVID) mostró una influencia negativa, pero sin significancia estadística. Estos hallazgos resaltan la complejidad y la dependencia contextual de la relación entre las características corporativas y la adopción de prácticas ESG.

Contribuciones del Estudio: El estudio contribuye al demostrar que las métricas financieras tradicionales (ROA, ROE) no predicen eficazmente la inversión en prácticas ESG en empresas brasileñas. Revela la complejidad de la toma de decisiones corporativas, donde la liquidez actúa negativamente y el tamaño positivamente. Esto sugiere que las prácticas ESG están influenciadas por múltiples factores más allá del desempeño financiero inmediato, lo que exige un enfoque más holístico para la sostenibilidad.

Palabras clave: ESG. Desempeño económico. Sostenibilidad. Empresas brasileñas.

Resumo

Objetivo: O objetivo deste estudo é analisar a relação entre o desempenho econômico e financeiro e as práticas de ESG em empresas brasileiras listadas na B3.

Metodologia: Trata-se de uma pesquisa descritiva com abordagem quantitativa, realizada por meio de procedimentos documentais. Os dados foram coletados de empresas listadas na B3 entre 2018 e 2022, utilizando-se a técnica de regressão de dados em painel para análise.

Resultados: Os resultados indicam que o Retorno sobre Ativos (ROA), o Retorno sobre o Patrimônio Líquido (ROE) e o Endividamento (END) não apresentaram influência estatisticamente significativa nas práticas de ESG. Em contraste, o Tamanho (TAM) da empresa influencia positivamente as práticas de ESG, e a Liquidez (LIQ) as influencia negativamente, sendo ambas as relações estatisticamente significativas. A variável de controle Covid (COVID) apresentou uma influência negativa, mas sem significância estatística. Esses achados destacam a complexidade e a dependência contextual da relação entre as características corporativas e a adoção de práticas ESG.

Contribuições do Estudo: O estudo contribui ao demonstrar que métricas financeiras tradicionais (ROA, ROE) não preveem eficazmente o investimento em práticas ESG em empresas brasileiras. Revela a complexidade da decisão corporativa, onde a liquidez atua negativamente, e o tamanho positivamente. Isso sugere que as práticas ESG são influenciadas por múltiplos fatores além do desempenho financeiro imediato, demandando uma abordagem mais holística para a sustentabilidade.

Palavras-chave: ESG. Desempenho econômico. Sustentabilidade. Empresas brasileiras.

1 Introduction

In recent years, the global landscape has been marked by profound economic, social, and environmental changes, which have significantly impacted business activities (Ballerini, Ballerini & Fontes, 2023). The emergence of issues related to sustainability, climate change, social responsibility, and governance has placed companies before new challenges and opportunities (Ballerini et al., 2023). In this context, the concept of ESG (Environmental,

Social, and Governance) has gained prominence as an integrated approach aimed at assessing companies' performance not only in financial terms but also in relation to the environmental and social impacts of their operations, as well as corporate governance practices (Hassani & Bahini, 2022).

ESG represents the evolution in the way organizations are evaluated and valued by investors, customers, employees, and society in general (Villalba & Strassburg, 2023). Sustainability and social responsibility have come to be considered essential elements for the survival and success of companies in the long term (Villalba & Strassburg, 2023). Investors are interested in allocating their resources to companies that show solid financial performance, while also demonstrating a commitment to sustainable and ethical business practices (Lemos, 2023).

The relationship between ESG and economic and financial performance has been the subject of research and debate in academia and the business world, in which its strategies and operations can obtain tangible benefits such as competitive advantage (Tavares & Lisboa, 2022), financial advantages, better reputation with consumers and investors, and risk reduction (Ballerini et al., 2023).

Despite significant advances in understanding the importance of ESG and its implications for corporate performance, there are gaps to be explored. One of these gaps relates to how a company's economic and financial performance can influence its initiatives and investments in ESG practices (Villalba & Strassburg, 2023). While discussions are extended about how ESG affects financial performance, little is known about the possible reverse impact, whether economic and financial performance can affect the company's ability or interest in adopting and implementing ESG practices (Villalba & Strassburg, 2023).

In the Brazilian business scenario, a significant gap persists in understanding the relationship between economic and financial performance and the adoption of ESG practices. Although it is recognized that companies with strong ESG engagement often reap benefits such as better reputation and access to capital, it is still uncertain how financial health or the pursuit of specific economic results shapes the ability or motivation to invest in sustainability. Thus, it is necessary to investigate this dynamic to optimize corporate strategies and sustainable development policies in the country.

Given this context, **the current study presents the following research problem: what is the influence of economic and financial performance on the ESG practices of Brazilian companies listed on B3?** Thus, the objective is to analyze the influence of economic and financial performance on the ESG practices of Brazilian companies listed on B3.

The conduct of this study is justified by its relevant contribution to the ESG literature in two main aspects. First, in line with the observations of Yip and Lau (2024), it enriches the discussion by providing a country-specific analysis of the impact on ESG practices, fitting into the growing literature focused on emerging markets. Second, this research deepens the understanding of the relationship between corporate performance and ESG practices, highlighting the potential role of company-specific variables.

Additionally, ESG practices are increasingly growing in the business environment. With investors and consumers increasingly concerned about environmental and social issues, Brazilian companies are being pressured to adopt and disclose their ESG initiatives (Fernandes & Linhares, 2017). Thus, understanding the relationship between economic and financial performance and ESG practices is important to guide business decision-making, responsible investments, and government policies. This research may also be relevant for investors, regulators, and other stakeholders who wish to assess the performance of companies under the

influence of ESG practices in the Brazilian context (Fernandes & Linhares, 2017; Mazzioni, Ascari, Rodolfo & Dal Magro, 2023).

It is essential to investigate the relationship between economic and financial performance and ESG practices in Brazilian companies, especially considering the constantly evolving context (Villalba & Strassburg, 2023; Araújo, Correia & Câmara, 2022). From a practical point of view, the study provides guidance for Brazilian companies, helping them make informed decisions about resource allocation, investment strategies, and sustainability policies. In addition, it promotes social benefits as companies incorporate ESG practices, contributing to the reduction of environmental impact, the promotion of social justice, and better working conditions (Himaras & Bahini, 2023). The research also aligns with global trends in social and environmental responsibility, improving the image of Brazilian companies on the international stage and attracting sustainable investors.

2 Literature review

2.1 Economic and financial performance and ESG practices

The economic and financial performance of Brazilian companies is a critical measure of their success and sustainability in the market, referring to the company's ability to generate revenue, profits, and growth over time. Financial performance, in turn, evaluates the efficiency in resource allocation, the management of assets and equity, the ability to pay debts, and the maximization of shareholder value (Frozza, De Castro Neto & Fernandes, 2006).

Companies that adopt solid ESG (Environmental, Social, and Governance) practices can obtain financial benefits, such as reduced operational costs, access to financing, and attraction of socially responsible investors (Soler, 2023). Similarly, companies with ESG practices tend to be more resilient in times of crisis, as they are better prepared to manage risks, maintain investor confidence, and adapt to changes in stakeholder expectations (Silva, 2023).

ESG practices are a set of criteria and actions adopted by companies with the aim of evaluating and incorporating considerations related to the environment in which they operate (Huang, 2021). These practices have gained recognition and notoriety due to the growing awareness of global challenges related to sustainability, climate change, social inequality, and corporate ethics (Aldowaish, Kokuryo, Almazyad & Goi, 2022). These practices stand out as a comprehensive approach to assessing the impact of companies on the environment, the communities in which they operate, and society as a whole (Aldowaish et al., 2022).

ESG practices in companies have become an undeniable reality and a requirement that companies must consider ensuring their survival, sustainability, and performance. At the macroeconomic level, most studies have focused on the effects of ESG on risk and uncertainty in economic policy (Borghesi, Chang & Li, 2019) or on the volatility of the capital market (Deng et al., 2022). At the microeconomic level, other studies have examined the impact of ESG on corporate financial performance and market value (Tampakoudis, Noulas, Kiosses & Drogalas, 2021; Van Linh, Hung & Binh, 2022; Wasiuzzaman, Ibrahim & Kawi, 2023), while the opposite direction related to the effect of a company's financial performance on ESG practices remains unexplored (Villalba & Strassburg, 2023).

Çigdem (2020) finds evidence that during periods of high Economic Policy Uncertainty Index (EPU), European companies increase their ESG practices essentially to reduce risk and preserve company value. However, in the specific context of state-owned enterprises, the empirical results of Zhao, Xiao, and Zhang (2021) show that the increase in EPU limits

Corporate Social Responsibility (CSR) behavior. Thus, the inhibitory effect of EPU on CSR is stronger for financially troubled companies.

Tampakoudis et al. (2021) demonstrated that, during the COVID-19 crisis, ESG had a negative and significant impact on investors, as the costs of sustainability activities outweighed the potential gains in a period of economic turbulence. Hassen and Hamdi (2022) found evidence that uncertainty in oil prices negatively affects Corporate Social Responsibility (CSR) for 507 U.S. companies in the period from 1985 to 2019.

In this context, it is essential to understand the reciprocal interaction between economic and financial performance and a company's ESG practices. On one hand, robust financial performance tends to facilitate greater investment and integration in ESG initiatives. On the other hand, ESG practices can boost the company's results; after all, a company in financial trouble will hardly be able to allocate resources to sustainability (Hamdi, Guenich & Ben Saada, 2022).

A solid economic and financial performance exerts a multifaceted influence on ESG practices. On the social aspect, it drives the improvement of working conditions and the increase in productivity. This financial capacity allows the company to invest in social, cultural, and sports initiatives, aiming at stakeholder satisfaction and the enhancement of its social score (Robinah & Akello, 2023).

In the environmental pillar, good performance encourages the adoption of measures for sustainable development, focusing on environmental protection. These actions include combating global warming and transitioning to a green and circular economy, which prioritizes renewable energy. Such initiatives not only build a positive reputation and generate stakeholder trust, but also promote the company's sustainability, facilitating the gradual abandonment of fossil fuels — which often increase expenses — and improving its environmental score (Gürel, Atasever & Gürel, 2025).

In the pillar of corporate governance, solid economic and financial performance allows the company, according to agency theory, to strengthen its practices. This includes the independence of the board of directors, the effective performance of the audit and risk committee, and the robustness of internal controls. Such measures preserve the rights of minority shareholders, minimize conflicts of interest between shareholders and managers, improve the quality of financial reporting, and consolidate an efficient and sustainable value creation process for all stakeholders. All these practices, in turn, raise the company's governance score (Hamdi et al., 2022).

Although investment in environmental, social, and governance (ESG) aspects is often conditioned by the company's economic and financial performance (Hamdi et al., 2022), most of the previous literature has focused on the inverse relationship: the impact of ESG on economic and financial performance, market value, and risk, incorporating these criteria into investment strategies (Tampakoudis et al., 2021; Wasiuzzaman et al., 2023). However, more recent research, such as that of Deng et al. (2022), also indicates that capital market opening mechanisms influence companies' ESG practices.

The perception that the costs of ESG practices may outweigh their potential gains leads shareholders and managers to condition investment in ESG actions on the company's performance. Thus, the improvement of corporate performance encourages the allocation of more resources to sustainability and governance (Hamdi et al., 2022). This growing investment, in turn, raises the company's ESG score, enhances its reputation, and strengthens trust with its stakeholders.

2.2 Research hypotheses

Discussions involving ESG practices and economic and financial performance have sparked the interest of the academic and professional community. Although the growing interest in the adoption of ESG practices by companies is positive and fundamental to promoting more sustainable development, it is necessary to recognize that merely adopting these practices by itself may not be sufficient to ensure corporate sustainability. In this context, ESG practices seem to have been limited to the investor's perspective, highlighting the importance of a more comprehensive approach that considers sustainability as an important aspect for organizations (Larrinaga, 2023).

From this perspective, Zhou and Caldecott (2020) investigated the relationship between the development of green assets and the adoption of ESG practices. They analyzed how the integration of these criteria by investors and companies influences the demand and supply of these assets, suggesting that the growing awareness of sustainable finance drives an increase in investment decisions based on ESG.

Chams, García-Blandón, and Hassan (2021) investigated whether ESG is driven by financial performance, as well as the moderating role of Total Quality Management (TQM) in this relationship. They revealed that there is a positive relationship between Free Cash Flow (FCF) and ESG scores. These findings suggest that companies with good liquidity tend to achieve higher ESG scores, indicating a link between the availability of financial capital and the pursuit of better sustainability management. The study also highlights that not all financial indicators are equally capable of driving sustainable investments, emphasizing the importance of free cash flow as a relevant antecedent for ESG practices in companies (Chasm et al., 2021).

Araújo et al. (2022) investigated the influence of environmental innovation on the corporate sustainability of Latin American companies, identifying it as a determining factor for ESG practices. The study revealed that environmental innovation positively impacts ESG scores and that companies that invest in more sustainable technologies and practices tend to achieve better financial results. This demonstrates that innovation is a critical element for the sustainable success of organizations.

Zhou and Liu (2023) examined the impact of digitalization on the economy and how it relates to resource efficiency in the pursuit of environmental, social, and governance (ESG) goals. The study identified that the total asset size and stock price are significant factors driving investments in ESG. This highlights the importance of companies' financial capacity and market sentiment in promoting commitment to ESG goals. However, the study also raises concerns regarding the allocation of received loans, suggesting that there may be insufficient green financing for ESG initiatives. In order to address this issue and promote investment in ESG through digitalization and resource efficiency, the authors recommend the implementation of practical policies, such as encouraging the adoption of green energy and the application of effective taxes on emissions. These measures can incentivize sustainable practices in publicly listed companies, contributing to the achievement of ESG goals and promoting a more digitalized and resource-efficient economy.

The discussions carried out reveal that, although the interrelationship between ESG and performance is widely debated, the specific influence of economic and financial performance on the adoption and improvement of ESG practices still represents an area that requires further empirical investigation. This research aims to address this gap, seeking to provide robust evidence that assists companies and information users in a process guided by sustainable commitment. Based on this perspective, the following research hypotheses are formulated:

H1a: ESG practices are positively and significantly influenced by economic and financial performance measured by ROA.

H1b: ESG practices are positively and significantly influenced by economic and financial performance measured by ROE.

3 Methodological procedures

3.1 Research strategy and method

This study is descriptive and quantitative in nature. Descriptive, because it seeks to analyze the influence of economic and financial performance on the ESG practices of Brazilian companies listed on B3. It is also quantitative, since it aims to identify cause-and-effect relationships between the variables, using statistical tools applied to a dataset. In terms of procedures, the research is documentary, as the data were collected from the Refinitiv® database, constituting the use of secondary data.

3.2 Population or sample

The population that comprises this study consists of all publicly traded companies listed on B3 (Brasil, Bolsa, Balcão) that were active in the year 2022. Thus, the population comprises 434 companies. Financial companies and holdings were excluded from the population because they have economic and accounting regulations that are significantly different from other branches of economic activity, and companies under judicial recovery were excluded as well because it impacts the composition of the profitability indices used in the present study (Leite, Bogoni & Hein, 2019; Pamplona, Leite & Costa da Silva Zonatto, 2018; Wrubel et al., 2016). Therefore, the final sample is composed of 240 Brazilian companies throughout the entire analysis period. Table 1 presents the composition of the research sample.

Table 1
Constitution of the research sample

Description	Amount
Population	434
(-) Financial companies	(70)
(-) Holding companies	(96)
(-) Companies under judicial reorganization	(28)
(=) Total sample	**240**

Source: research data.

The analysis period covers from 2018 to 2022, a five-year timeframe. Although the 17 Sustainable Development Goals (SDGs) were established in 2015 by the United Nations Summit (Mazzioni et al., 2024), the choice of 2018 is justified by the fact that ESG (Environmental, Social, and Governance) metrics in emerging countries like Brazil reached greater consistency and equity, making the data more trustworthy for analysis. This period also stands out for the intensification of awareness about sustainability, pressure from investors, and incentives from regulatory agencies for the adoption and reporting of ESG practices (Mazzioni et al., 2024).

Thus, the period allows for the investigation of the behavior of Brazilian companies in a context of robust ESG data and increasing regulatory and market attention, providing

information on the maturation of sustainability practices in emerging economies. The availability of data also supported this choice, since longer periods would significantly reduce the number of companies, compromising a representative sample. Table 2 presents the sample distributed by year and sector.

Table 2
Sample by year and sector

Sector	Period					
	2018	2019	2020	2021	2022	Total
Energy	4	5	6	8	8	36
Materials	10	9	10	12	12	63
Industrial	7	14	14	16	16	74
Consumer goods	11	18	24	25	27	116
Consumer goods	9	11	14	14	14	71
Health care	5	5	6	7	7	34
Computer science and technology	1	1	1	1	3	8
Communication services	3	3	3	3	4	18
Public health services	14	15	16	17	17	93
Real estate	2	2	3	4	4	16
Total	66	83	97	107	112	528

Source: research data.

3.3 Definition of variables and database

Table 3 presents the research variables and their respective forms of operationalization.

Table 3
Research variables

Variables	Description	Metric	Source
Dependent	ESGR (ESG rating)	Scale from 0 to 100, considering the dimensions: environmental, community, employees, and corporate governance.	Refinitiv®
	ROA (Return on assets)	$\frac{EBIT}{Total\ Asset}$	
	ROE (Return on equity)	$\frac{Net\ Income}{Shareholders'\ Equity}$	
Independent	DEB (Total debt)	$\frac{Current\ Liabilities + Non - Current\ Liabilities}{Total\ Asset}$	
	LIQ (General liquidity)	$\frac{Current\ Assets}{Current\ Liabilities}$	
	Size (Company size)	Natural logarithm of total assets	
Control	COVID	Dichotomous variable 1 for the COVID-19 period, 0 otherwise.	

Source: research data.

The study variables, detailed in Table 3, were selected based on the reviewed literature, which highlights their potential to analyze the influence of economic and financial performance on ESG practices of Brazilian companies listed on B3. The dependent variable, ESG, is measured by the score available in the Refinitiv® database. This score ranges from 0 to 100, where 100 represents compliance with all criteria analyzed by the database, and 0 indicates non-compliance with any (Ioannou & Serafeim, 2012; Mazzioni et al., 2024). Refinitiv® structures its ESG scoring into environmental, social, and governance pillars, which are further subdivided into specific dimensions, such as emissions, environmental product innovation, human rights, and Corporate Social Responsibility (CSR) strategies, among others (Mazzioni et al., 2024).

The independent and control variables were selected based on their relevance in the literature to explain ESG practices. The independent variables include profitability metrics, such as Return on Assets (ROA), which reflects efficiency in generating profits, and Return on Equity (ROE), which indicates profitability for shareholders. The choice of these metrics is justified by the correlation between better economic and financial performance and a greater capacity to invest in ESG initiatives (Rahman, Zahid & Al-Faryan, 2023).

Additionally, the financial and operational characteristics Debt (DEB), Overall Liquidity (LIQ), and Size (S) were included. Debt and Overall Liquidity influence the company's ability and propensity to allocate capital to ESG projects, while Size (S) is associated with greater public visibility, regulatory scrutiny, and availability of resources to develop and report robust ESG practices (Abdul Rahman & Alsayegh, 2021; Mazzioni et al., 2024). All data for these variables were obtained from the Refinitiv® database. As a control variable, Covid (COVID) (Mazzioni et al., 2024) was employed, whose inclusion aims to isolate the effects of a global exogenous shock that impacted the business environment and altered corporate priorities, including the sustainability strategies of the analyzed organizations.

3.4 Data analysis technique

For data analysis, spreadsheets were used for tabulation. Descriptive statistics (mean, standard deviation, minimum, and maximum) and multiple linear regression for panel data with unbalanced data were performed using the statistical software Stata®. In the regression model, the assumptions of normality, multicollinearity, residual autocorrelation, and heteroscedasticity were checked and respected. With the aim of analyzing the influence of economic and financial performance on the ESG practices of Brazilian companies listed on B3, the multiple linear regression model was formulated according to Equation 1.

$$ESGR = \beta_0 + \beta_1 ROA + \beta_2\, ROE + \beta_3 END + \beta_4 RCD + \beta_5 S + \beta_6 COVID + \sum SectorFixedEffect + \sum EFixedEffectYear + \varepsilon \quad \text{(Equation 1)}$$

Where:

ESGR: Scale from 0 to 100, considering the dimensions: environmental, community, employees, and corporate governance.
ROA: Return on Assets
ROE: Return on Equity
DEB: Debt
LIQ: General Liquidity

S: Company Size
COVID: Covid
∑SectorFixedEffect: sector fixed effects control
∑SectorFixedEffect: year fixed effects control
ε: Error Term (residual)

4 Results and analyses

4.1 Descriptive statistics

Table 4 presents the descriptive statistics of the dependent numerical variable (ESGR) and the independent numerical variables (ROA, ROE, DEB, LIQ, and S).

Table 4
Descriptive statistics

Variable	Mean	Standard deviation	Minimum	Maximum
ESGR	50.66	20.49	1.27	91.44
ROA	0.08	0.07	-0.28	0.38
ROE	0.09	0.38	-3.95	1.85
DEB	2.68	4.1	0.1	39.66
LIQ	1.88	1.14	0.48	11.8
S	22.89	1.48	18.67	27.19

Caption: ESGR: ESG; ROA: Return on Assets; ROE: Return on Equity; DEB: Total Debt; LIQ: General Liquidity; S: Company Size.
Source: research data.

The analysis of the descriptive statistics, presented in Table 4, reveals the heterogeneity of the sample of companies. The dependent variable, ESGR, has an average score of 50.66, with a standard deviation of 20.49, indicating considerable dispersion among the companies and a range that varies from a minimum of 1.27 to a maximum of 91.44. These results are in line with the findings of Mazzioni et al. (2024) when analyzed in the Brazilian context.

Regarding the independent variables, ROA (Return on Assets) shows an average of 0.08 and a standard deviation of 0.07, with values ranging from -0.28 to 0.38, suggesting that most companies have positive operational profitability, but with some exceptions. ROE (Return on Equity), with an average of 0.09, stands out for its high standard deviation of 0.38 and an extreme range (from -3.95 to 1.85), indicating a large variability in shareholder profitability. These results are similar to those found in the studies by Beuren, Pamplona, and Leite (2020) and Leite, Pamplona, and Hein (2021).

In turn, Debt (DEB) has an average of 2.68, but with a standard deviation of 4.1 and a maximum value of 39.66, suggesting the presence of companies with very high levels of financial debt. The Debt Coverage Ratio (LIQ), with an average of 1.88 and a standard deviation of 1.14, ranges from 0.48 to 11.8, indicating that, on average, companies have adequate coverage capacity, but with cases of low and high liquidity. Company Size (S), measured by the natural logarithm, has an average of 22.89 and low dispersion (standard deviation of 1.48), ranging from 18.67 to 27.19, indicating relative homogeneity in company size. These results are similar to those found in the studies by Mazzioni et al. (2024).

4.2 Panel data regression

Table 5 shows the results of the regression analysis on panel data, focusing on examining how different independent variables (ROA, ROE, DEB, LIQ, S, and COVID) influence ESG practices (ESGR).

Table 5
Influence of performance on ESG practices

ESGR	Coefficient	Robust Std. Error	*t*	*p-value*
ROA	10.81653	11.81168	0.92	0.360
ROE	-1.613814	2.047692	-0.79	0.431
DEB	-0.099915	0.1816923	-0.55	0.583
LIQ	-1.909471	0.5476912	-3.49	0.001***
S	6.771642	0.6156086	11.00	0.000***
COVID	-1.397529	2.579017	-0.54	0.588
Observations				528
R-squared				0.31
Sector FE				Yes
Year FE				Yes

Note: Significance at the level of *** 1%, ** 5%, and * 10%. Caption: ESGR: ESG; ROA: Return on Assets; ROE: Return on Equity; DEB: Total Debt; LIQ: General Liquidity; S: Company Size; Sector FE: Sector Fixed Effect; Year FE: Year Fixed Effect.
Source: research data.

According to Table 5, the Return on Assets (ROA) variable showed a positive influence (coefficient of 10.81653) on ESG practices (ESGR), however without statistical significance. Similarly, Return on Equity (ROE) presented a negative influence (coefficient of -1.613814) on ESG practices, also in a non-significant manner. Although studies such as Zhou and Caldecott (2020) suggest a positive relationship between sustainable financial practices and investment decisions based on ESG criteria, the lack of statistical significance for ROA and ROE in this investigation aligns with the perspective of Chams et al. (2021), who warn that not all performance indicators are able to explain investments in ESG practices. This may indicate that, for the sample and period analyzed, traditional profitability performance is not the main driver or predictor of companies' ESG practices.

The Debt variable (DEB) showed a negative influence (coefficient of -0.099915) on ESG practices (ESGR), however without statistical significance. Although not statistically significant, this negative result suggests that companies with higher debt may prioritize debt management over investments in ESG. This finding diverges significantly from the prevailing literature, in which Mazzioni et al. (2024), in a context of G20 companies (including Brazil), identified a positive and significant relationship between debt and ESG practices.

Similarly, Abdul Rahman and Alsayegh (2021) and Baldini et al. (2018) also found that financial debt can drive higher levels of ESG engagement. These authors argue that more indebted companies often face greater scrutiny and pressure from investors and other stakeholders, which leads them to increase disclosure levels and improve their ESG practices as a way to enhance visibility and build trust in the market. The lack of significance and the negative sign in the present study indicate a possible peculiarity in the sample or a particular context that challenges this dynamic.

The General Liquidity (LIQ) variable showed a negative and statistically significant influence (coefficient of -1.909471, $p<0.01$) on ESG practices (ESGR). This result diverges from what is commonly observed in the literature, such as in the study by Chams et al. (2021),

which suggests a positive relationship where companies with higher liquidity tend to achieve higher ESG scores, justified by greater availability of capital to invest in sustainability initiatives. The divergence found in this study may indicate that, for the sample analyzed, excessive or poorly managed liquidity does not necessarily translate into greater investments in ESG. This finding challenges the assumption that the availability of capital is sufficient to drive ESG practices, pointing to the complexity of corporate resource allocation.

The Size (S) of the companies in the sample showed a positive and statistically significant influence (coefficient of 6.771642, $p<0.01$) on ESG practices (ESGR). This result corroborates findings from previous studies, such as those by Baldini et al. (2018), Garcia, Mendes-Da-Silva, and Orsato (2017), and Mazzioni et al. (2024), which indicate that larger companies tend to exhibit better ESG practices. This convergence is justified by the fact that larger companies generally have more financial and human resources to invest in sustainability initiatives, face greater public visibility and regulatory scrutiny, and are under greater pressure from various stakeholders (investors, consumers, regulators) to demonstrate social and environmental responsibility. Additionally, large corporations tend to have more robust governance structures and departments that allow for the effective implementation and monitoring of ESG strategies.

The COVID variable showed a negative influence (coefficient of -1.397529) on ESG practices (ESGR). Although this relationship was not statistically significant, the result suggests that, during the COVID-19 pandemic period, the companies in the sample may have reallocated resources or reassessed their investment priorities, potentially to the detriment of ESG initiatives. This finding contrasts with the results of Mazzioni et al. (2024), who observed more robust ESG practices during the pandemic years, on average, in the countries that make up the G20. The divergence can be understood in light of the broad macro and microeconomic repercussions, as highlighted by Habib and Mourad (2024).

While more resilient companies or those under greater pressure from stakeholders may have intensified their ESG efforts as a long-term strategy or social responsibility, others, possibly more affected by the crisis and focused on operational survival, may have prioritized immediate financial stability, postponing or reducing investments in areas such as ESG. This indicates a heterogeneous response of companies to the pandemic shock, where pressure for liquidity and uncertainty may have led to the postponement of investments not considered essential in the short term.

The results of this study do not allow accepting Hypotheses $H1_a$ and $H1_b$, indicating that ROA and ROE do not significantly influence ESG practices, challenging the expected linear relationship. The lack of significance for Debt (DEB) and COVID highlights the complexity of ESG factors. On the other hand, the company's Size (S) confirms its positive and significant influence, while General Liquidity (LIQ) shows a negative and significant relationship, a divergent finding. The relevance of these findings lies in demonstrating that the adoption of ESG practices is multifaceted and contextually dependent, not driven solely by traditional financial metrics, and that external shocks can generate heterogeneous responses, especially in specific markets.

5 Final considerations

The objective of this study was to analyze the relationship between economic and financial performance and ESG practices in Brazilian companies listed on B3. To achieve this objective, regression analysis on panel data was used, with data collected from companies listed on B3 from 2018 to 2022. Based on the analysis of the results, it can be inferred that, for the

sample analyzed, Hypotheses H1a and H1b cannot be accepted, since neither Return on Assets (ROA), which showed a positive influence, nor Return on Equity (ROE), with its negative influence, showed statistical significance regarding ESG practices. This lack of significance for traditional profitability indicators, combined with the lack of significance of Debt (DEB) – which showed a negative relationship, contrasting with literature findings that suggest the opposite – and the COVID variable, which was also not significant and pointed to a reduction in ESG practices during the pandemic, challenges the idea of a linear and universal relationship between economic and financial performance and external events and ESG engagement.

In contrast, Company Size (S) emerged as a robust predictor, with a positive and statistically significant influence on ESG, aligning with the literature that associates larger size with more resources and pressure to invest in ESG practices. Conversely, General Liquidity (LIQ) showed a negative and statistically significant influence, a divergent finding that suggests that, for the studied sample, greater availability of capital does not always translate into prioritizing investments in ESG. In summary, these findings reveal that the dynamics between corporate characteristics and ESG practices are complex, not driven exclusively by basic financial metrics or responding uniformly to external shocks, and that the motivation for ESG is strongly dependent on the context and peculiarities of each company and market.

This study contributes significantly to the literature on the influence of financial performance on ESG practices by reinforcing the thesis that not all traditional metrics are effective predictors of investment in sustainability. By highlighting the lack of statistical significance of ROA and ROE, as well as the inverse relationship of liquidity with ESG practices in the analyzed sample, the research demonstrates the complexity of corporate decision-making regarding ESG practices. Such findings indicate that companies consider a diverse range of factors beyond immediate financial performance when defining their ESG commitments. Thus, the research emphasizes the need for a more holistic approach to understand corporate sustainability strategies and policies, which integrates stakeholder pressures, sectoral context, resource capacity, and long-term strategic vision, transcending the mere optimization of short-term financial indicators.

This research has limitations inherent to its scope and methodology. Firstly, the relatively recent nature of the development of ESG practices in organizations implies that the analysis period may not capture the entire evolution or maturation of these strategies, suggesting that future studies with longer time horizons could reveal different dynamics in relation to ESG practices. Secondly, the statistical technique employed, although robust, does not allow a direct approximation to the peculiarities of each company, which opens the door to the application of alternative methodological approaches that could enrich the understanding of the underlying mechanisms.

Additionally, the results are limited to the context of Brazilian companies, which may restrict generalization to other markets. However, it is important to highlight that, despite these acknowledged limitations, the results obtained in this study are not invalidated. They provide a relevant and significant snapshot of the reality observed within the established methodological and temporal scope, contributing important empirical evidence to the literature and to future research agendas that aim to deepen or contrast these findings in other contexts.

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