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Relationship between recognition of provisions and ESG performance of Brazilian companies listed on the stock exchange

Relação entre o reconhecimento de provisões e o desempenho ESG de companhias listadas brasileiras

Relación entre el reconocimiento de provisiones y el desempeño ESG de las empresas brasileñas que cotizan en bolsa

Larissa Ribeiro Soares
Mestre em Ciências Contábeis pela Universidade Federal
de Uberlândia (UFU)
Doutoranda em Ciências Contábeis na Universidade
Federal de Minas Gerais (UFMG), Uberlândia/MG, Brasil
larissaribeiro.00@hotmail.com
https://orcid.org/0000-0002-0448-5450

Denise Mendes da Silva
Doutora em Controladoria e Contabilidade pela
Universidade de São Paulo (USP)
Professora Associada na Universidade Federal de
Uberlândia (UFU), Uberlândia/MG, Brasil
denise.mendes@ufu.br
https://orcid.org/0000-0002-1490-5148

Dermeval Martins Borges Júnior*
Doutor em Ciências Contábeis pela
Universidade Federal de Uberlândia (UFU)
Doutor em Administração pela
Universidade Federal de Uberlândia (UFU)
Professor Adjunto na Universidade Federal de Goiás (UFG),
Goiânia/GO, Brasil
dermeval.junior@ufg.br
https://orcid.org/0000-0003-2279-449X

Primary contact address for correspondence *
Universidade Federal de Goiás, Campus Samambaia, Prédio da FACE, 1109, CEP: 74690-900– Goiânia/GO, Brasil

Abstract
This study aims to examine the relationship between the recognition of provisions and the environmental, social and governance (ESG) performance of Brazilian listed companies. Using a quantitative approach and panel regression, the research analyzes ninety-seven companies listed on B3, between 2014 and 2022. The results indicate a positive relationship between the recognition of provisions and environmental and governance performance. Social provisions are positively related to social performance, while environmental provisions have a negative relationship with environmental performance, when measured by their monetary value, and positive, when measured by dummies. The results obtained can assist in making decisions about capital allocation, considering not only financial aspects, but also voluntary information related to ESG performance.
Keywords: Recognition of Provisions; ESG performance; Disclosure

Resumo
Este estudo tem o objetivo de examinar a relação entre o reconhecimento de provisões e o desempenho ambiental, social e de governança (ESG) das companhias listadas brasileiras. Com abordagem quantitativa e regressão com dados em painel, a pesquisa analisa 97 empresas listadas na B3, entre 2014 e 2022. Os resultados indicam uma relação positiva entre o reconhecimento de provisões e o desempenhoambiental e de governança. As provisões sociais estão positivamente relacionadas ao desempenho social, enquanto as provisões ambientais apresentam uma relação negativa com odesempenho ambiental, quando mensuradas pelo seu valor monetário, e positiva, quando mensuradas por *dummies*. Os resultados obtidos podem auxiliar na tomada de decisões sobre alocação de capital, considerando não apenas os aspectos financeiros, mas também as informações voluntárias relacionadas ao desempenho ESG.
Palavras-chave: Reconhecimento de Provisões; Desempenho ESG; *Disclosure*

Resumen
Este estudio tiene como objetivo examinar la relación entre el reconocimiento de provisiones y el desempeño ambiental, social y de gobernanza (ESG) de las empresas brasileñas que cotizan en bolsa. Utilizando un enfoque cuantitativo y regresión de panel, la investigación analiza 97 empresas que cotizan en B3, entre 2014 y 2022. Los resultados indican una relación positiva entre el reconocimiento de provisiones y el desempeño ambiental y de gobernanza. Las provisiones sociales están relacionadas positivamente con el desempeño social, mientras que las provisiones ambientales tienen una relación negativa con el desempeño ambiental, cuando se miden por su valor monetario, y positiva, cuando se miden mediante variables ficticias. Los resultados obtenidos pueden ayudar en la toma de decisiones sobre asignación de capital, considerando no solo aspectos financieros, sino también información voluntaria relacionada con el desempeño ESG.
Palabras clave: Reconocimiento de Provisiones; desempeño ESG; Divulgación

1 Introduction

The rise of agendas and discussions surrounding the disclosure of information related to Corporate Social Responsibility (CSR) and environmental, social, and governance (ESG) aspects has been observed in the financial market. This is due to the recognition of the need to assess the impacts of organizational activities and the demands from stakeholders for increasingly transparent and accurate information aligned with business reality (Raimo et al., 2021; Christensen et al., 2022).

Voluntary disclosures refer to specific reports, such as Annual Reports, Sustainability Reports, Integrated Reports, among others, and are grounded in the attempt to reduce agency conflicts, minimizing information asymmetry and enhancing the reliability of what is reported. These reports have facilitated the creation of ESG scores (indices), which aim to measure companies' performance regarding voluntary disclosures, encompassing environmental, social, and governance practices (Martins & Cunha, 2022). Additionally, it is important to note that environmental, social, and legal impacts may also be recognized in Financial Statements through provisions.

From this perspective, Ribeiro et al. (2019) concluded that the environmental provision recognized in the balance sheet is relevant for explaining the level of environmental disclosure, as measured by Bloomberg's Environmental Disclosure Score (EDS), with an impact slightly lower than a company's inclusion in the Corporate Sustainability Index (ISE). Based on this inference, in a subsequent study, Ribeiro et al. (2022) concluded that, among non-potentially polluting companies, being part of the ISE is significant for explaining the EDS, supporting the image theory. In contrast, among potentially polluting companies, the materiality of environmental provisions is significant for explaining the EDS, aiming at self-legitimation.

In other words, an association was identified between the recognition of environmental provisions and the score that classifies environmental performance, regardless of whether the companies' motivation is to preserve their image in the face of environmental liabilities or to legitimize the existence of such liabilities through environmental disclosure measured by the EDS. However, it is noted that Ribeiro et al. (2022) focused on evaluating only one ESG pillar and only one type of provision (environmental), creating an opportunity for further research in this line, including other provisions that may be related to ESG performance.

Essentially, provisions are designated as present obligations with estimated values, likely requiring an outflow of resources to settle these obligations (Ribeiro et al., 2019; Bergamini, 2021). In literature, studies have investigated variables (determinants) that may explain the recognition or disclosure of provisions, such as: (i) corporate governance (Acar & Ozkan, 2017); (ii) profitability (Silva et al., 2018); (iii) size, profitability, leverage, auditing, and governance (Barcelar et al., 2023).

In turn, the determinants of ESG performance (or ESG scores) have also been the subject of studies, such as those by Drempetic et al. (2019), Crespi and Migliavacca (2020), Sharma et al. (2020), Elafify (2021), Rahman and Alsayegh (2021), Chung et al. (2024), and Hmouda et al. (2024). These studies concluded that variables such as company size, profitability, the country's economic and social development, financial and market performance, leverage, board independence and size, audit firm, and industry sector are related to ESG performance or ESG scores within the respective contexts analyzed.

As observed, the literature demonstrates that some determinants of provisions coincide with determinants of the scores that classify companies' ESG performance. However, no studies were found that addressed this perspective in an integrated manner, considering a possible relationship between the recognition of provisions and ESG performance. This study, therefore, represents an opportunity to identify whether the recognition of provisions, the amount recognized, or their materiality could be an additional determinant of the ESG score, thereby legitimizing companies' actions.

In this context, considering the three dimensions of the ESG score (environmental, social, and governance), the following research question is formulated: **what is the relationship between the recognition of provisions and the environmental, social, and governance performance of Brazilian listed companies?** The objective of this study is to examine the relationship between the recognition of provisions and the environmental, social, and governance performance of Brazilian listed companies.

This study advances beyond previously developed research by proposing to analyze the relationship between all types of provisions recognized in companies and the overall ESG score (environmental, social,

and governance performance), as well as considering the pillars individually. This proposition aims to demonstrate whether ESG performance is being used to legitimize the existence of environmental, social, or legal liabilities in companies.

The main contribution of this study, both theoretically and practically, lies in the opportunity to verify whether the recognition of provisions by companies leads them to report ESG practices, particularly in situations where the risks highlighted in the financial statements, through provisions, are incompatible with ESG performance. More specifically, the study aims to fill a gap in the related literature by focusing on the ways in which financial information (in this case, provisions) impacts voluntary disclosures, which encompass information considered non-financial.

Specifically in the practical realm, the in-depth analysis of accounting information and the evaluation of companies' financial and non-financial performance, particularly through the recognition of provisions in the ESG (environmental, social, and governance) context, offer significant benefits to various stakeholders in the financial market. For analysts, this expanded approach contributes to a better understanding of companies' performance, going beyond traditional indicators and incorporating sustainable and social aspects into evaluations.

Regarding investors, it is evident that they also benefit from the comprehensive analyses proposed in this study, as they can make informed decisions aligned with their own sustainable investment criteria. Addressing the impacts of provisions on ESG performance can help identify companies that are adopting responsible practices and managing risks effectively, thereby attracting investors who value such aspects.

Finally, for regulatory bodies, the approach considered in this research can inform discussions on improvements in accounting policies and standards, focusing on promoting greater transparency and corporate responsibility, such as those related to the mandatory adoption of standards for reporting sustainability-related financial information and the requirement for audits of such reports. Overall, the results can also guide business decisions by analyzing the effects and impacts arising from the recognition of provisions on ESG performance.

2 Literature Review and Hypothesis Development

According to information available on the LSEG Data & Analytics platform portal (2022), corporate actions related to environmental, social, and governance aspects are evaluated to form performance metrics corresponding to ESG scores. The ESG score is generated through a comprehensive assessment of a company's practices and policies regarding environmental, social, and governance issues. This process involves collecting detailed data on various criteria, such as carbon emissions, waste management, diversity policies, board structure, among others. Each criterion is weighted based on its relative importance, considering factors such as industry relevance and overall impact on sustainability (LSEG Data & Analytics, 2022).

Companies are evaluated and scored on each criterion, and the individual scores are aggregated to create an overall ESG score. Thus, higher scores reflect better performance in ESG practices, while lower scores indicate poorer performance. This score reflects the company's commitment to corporate social responsibility and enables comparisons with other organizations, assisting investors and stakeholders in decision-making (LSEG Data & Analytics, 2022).

According to Seow (2024), stakeholders, particularly investors, are relying on companies' ESG disclosures to assess their ESG performance and develop strategies for their investment decision-making. Additionally, Martiny et al. (2024) state that understanding the determinants of companies' ESG performance is not only a fundamental goal of strategic management but also critical for addressing the world's most pressing environmental and social challenges and ensuring the survival of ESG.

Disclosures may be associated with various factors, as they aim to meet the needs of different users (Iudícibus, 2010). Thus, variables such as company size, profitability, leverage or indebtedness, industry sector, and corporate governance are considered determinants of the level of disclosure by companies and, consequently, of ESG performance, based on the disclosed ESG practices.

Regarding size, there is a tendency for larger companies to disclose more information than smaller ones, as larger companies are more likely to face greater regulatory requirements or seek legitimacy among stakeholders (Ricardo et al., 2017; Borges, 2019; Drempetic et al., 2019), which also impacts their ESG score (performance). In turn, Borges (2019) found that profitability is positively associated with disclosure, just as Sharma et al. (2020) verified that profitability impacts the ESG score. In other words, more profitable companies tend to disclose more information to maintain or improve their economic or environmental, social, and governance performance.

Elafify (2021) identified a positive correlation between leverage and corporate sustainability disclosure, as did Borges (2019). However, there is no consensus on the influence of leverage on the ESG score, as Rahman and Alsayegh (2021) found a positive relationship, while Sharma et al. (2020) and Crespi and Migliavacca (2020) identified a negative relationship.

Patten (2002) identified that entities with potential sensitivity to environmental legislation tend to exhibit a higher level of disclosure compared to companies in sectors less sensitive to the environment. Thus, specific regulations, prioritization of reputation, and sensitivity to stakeholders are some of the factors that lead

companies in certain sectors to present greater disclosure (Murcia & Santos, 2009; Consoni & Colauto, 2016), which should reflect in ESG performance. Finally, when considering the corporate governance variable, some studies reveal a positive relationship with the level of disclosure, indicating a tendency for companies listed in segments that reflect greater corporate governance (transparency) to disclose more information (Murcia & Santos, 2009; Consoni & Colauto, 2016; Ribeiro et al., 2019), positively impacting the ESG score.

As can be seen, although there are studies that have addressed the voluntary disclosure of ESG and CSR practices, their determinants, and economic consequences, there is a gap regarding the relationship between the recognition of provisions and the environmental, social, and governance performance of companies. From this perspective, Ribeiro et al. (2019) investigated, from 2010 to 2015, whether the environmental provision recognized in the balance sheet is positively associated with the level of environmental disclosure of Brazilian companies in the electric energy sector, measured by the Environmental Disclosure Score (EDS), one of the three components of the ESG disclosure score from Bloomberg. Ribeiro et al. (2019) found that larger companies with higher profitability, included in the Corporate Sustainability Index (ISE), and with environmental provisions in the balance sheet tend to disclose more environmental information, and concluded that the recognition of environmental provisions in the balance sheet is relevant for explaining the level of environmental disclosure.

Based on this conclusion, in a subsequent study (2010-2018) with Brazilian non-financial companies, Ribeiro et al. (2022) investigated which theory better explains the motivation for environmental disclosure: the image theory (proxy: inclusion in the ISE) or the legitimation theory (proxy: materiality of provisions for environmental damages in the balance sheet). From this perspective, Ribeiro et al. (2022) concluded that, among non-potentially polluting companies, being part of the ISE is significant, with a proactive strategy of creating value and differentiation through environmental disclosure prevailing (image theory). In contrast, among potentially polluting companies, the materiality of environmental provisions is significant, with a reactive stance of disclosing to seek self-legitimation among stakeholders after causing environmental damage prevailing (legitimation theory).

Based on the study by Ribeiro et al. (2022), it can be argued that an important aspect to consider in reports deemed voluntary or containing information considered non-financial is their alignment with financial (mandatory) information. This implies that it is not coherent to present a narrative highlighting concern for environmental and social issues if the financial statements reveal, for example, a high amount of environmental, civil, and labor liabilities (provisions). Given that ESG performance (score) results from companies' transparency (disclosure) regarding their environmental, social, and governance practices, it is expected to be related to economic-financial performance and vice versa.

Based on the above, it can be inferred that companies with recognized provisions tend to disclose more information about their environmental, social, and governance practices, to compensate or legitimize themselves before society or the market. Consequently, it is expected that such companies will have better ESG performance, which supports the following hypotheses:

H1: The recognition of provisions is positively related to the ESG performance of Brazilian companies listed on B3.

H2: The recognition of provisions is positively related to the environmental performance of Brazilian companies listed on B3.

H3: The recognition of provisions is positively related to the social performance of Brazilian companies listed on B3.

H4: The recognition of provisions is positively related to the governance performance of Brazilian companies listed on B3.

Additionally, it is possible to identify environmental provisions and those considered social, such as pension (or labor), civil, and employee benefit provisions. Thus, they can be related to the respective environmental and social scores, based on the same expectation that the greater the recognition of these types of provisions, the higher the environmental and social performance (score), as predicted in the following hypotheses:

H5: The recognition of environmental provisions is positively related to the environmental performance of Brazilian companies listed on B3.

H6: The recognition of social provisions is positively related to the social performance of Brazilian companies listed on B3.

There is no theoretical or literature support for segregating or grouping certain types of provisions that would be characterized as governance-related, since this dimension involves elements related to management and transparency. In this sense, it is understood that hypothesis H4 sufficiently addresses, in general terms, the analysis intended in this study.

3 Methodological Procedures
3.1 Sample and Data Collection

The research population includes Brazilian publicly traded companies listed on B3, from 2014 to 2022, that reported an ESG score in the LSEG Data & Analytics database, totaling 97 companies. The justification for the chosen study period is based on the evaluation of publicly available data, with a significant increase in

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ESG score disclosures starting from 2014. The selection of 2022 as the end of the sample period is due to the data collection having occurred in the second half of 2023, when more recent annual data were not yet available. The choice of the LSEG Data & Analytics database is attributed to its accessibility.

The ESG scores were collected by accessing the LSEG Data & Analytics database, which explicitly states that the ESG score is obtained based on the evaluation of publicly available and auditable data provided by the companies. The main themes, evaluated for the weighting of the calculations, are allocated into categories following the three ESG pillars. The ESG scores from LSEG Data & Analytics are designed to transparently and objectively measure aspects related to a company's ESG performance, commitment, and effectiveness (LSEG Data & Analytics, 2022).

Regarding provisions, they were measured in three ways. The first was through the total gross amount recognized. Although this approach may attract criticism, the use of absolute value metrics instead of relative ones has been observed in recent studies on provisions, such as Ribeiro et al. (2019), Oliveira et al. (2022), and Borges and Rover (2022). The justification for its use stems from identifying the magnitude of provisions in monetary terms, which can be useful for certain descriptive analyses, as presented in Table 2. Nevertheless, acknowledging the limitations of this variable, two other measurement approaches were considered: a dummy variable that identifies recognized provisions and the representativeness of the provision amount relative to total assets (Ribeiro et al., 2019; Ribeiro et al., 2022). Table 1 lists the variables used in the econometric models.

Table1
Variables used in the econometric models.

Variable	Variable Type	Proxy	Acronym	Expected Effect	Authors
ESG	Dependent	Company ESG performance in LSEG, based on verifiable publicly reported data	ESG	N/A	Drempetic et al. (2019); Crespi and Migliavacca (2020); Sharma et al. (2020); Elafify (2021); Rahman and Alsayegh (2021); Chung et al. (2024); Hmouda et al. (2024)
Environmental performance	Dependent	Company environmental performance in LSEG, based on verifiable publicly reported data	ENV	N/A	Crespi and Migliavacca (2020); Rahman and Alsayegh (2021); Chung et al. (2024); Hmouda et al. (2024)
Social performance	Dependent	Company social performance in LSEG, based on verifiable publicly reported data	SOC		
Governance performance	Dependent	Governance performance in LSEG, based on verifiable publicly reported data	GOV		
Provisions	Independent	Monetary value of the provision recognized by company i in year t	PROVT	(+)	Ribeiro et al. (2019)
	Independent	Dummy value of "1" for company i that has a provision in year t; and "0" if no provision is presented	PROV_D		Ribeiro et al. (2019); Ribeiro et al. (2022)
	Independent	Representativeness of the total provision value of company i in year t, relative to the total asset value of company i in t, expressed as a percentage	PROVT_AT		
Size	Control	Natural Logarithm of Assets	AT	(+)	Drempetic et al. (2019); Crespi and Migliavacca (2020); Sharma et al. (2020); Elafify (2021); Rahman and Alsayegh (2021)

Variable	Variable Type	Proxy	Acronym	Expected Effect	Authors
Profitability	Control	Net Income / Assets	ROA	(+)	Elafify (2021); Chung et al. (2024)
	Control	Net Income / Equity	ROE	(+)	In analogy to the study by Crespi and Migliavacca (2020)
Leverage	Control	Liabilities / Equity	ALAV	(+)	Drempetic et al. (2019); Elafify (2021)
Sector	Control	Vector of dummy variables that identify the corresponding business sectors of the companies in the sample	SETOR	(+)	Sharma et al. (2020); Chung et al. (2024)
Year	Control	Vector of dummy variables that identify the years from 2014 to 2022	ANO	N/A	Crespi e Migliavacca (2020); Chung et al. (2024)
Corporate Governance	Control	Dummy value of "1" for company *i* listed on the Novo Mercado in year *t*; and "0" for listing in other segments	SEG	(+)	Ribeiro et al. (2019)

N/A = not applicable.

As shown in Table 1, in addition to the variables of interest (ESG performance and provisions), control variables identified in the literature were included. It is noteworthy that the joint use of ROA and ROE in the same model allows for a more comprehensive and detailed assessment of companies' economic performance. While ROA evaluates the company's operational efficiency in generating profit relative to total assets, ROE measures profitability in relation to shareholders' equity, providing different perspectives on resource utilization and company management. Environmental provisions and those grouped as social provisions (pension, civil, and employee benefits) followed the same configurations as the provisions in Table 1.

3.2 Data Analysis Procedures

The data were analyzed using descriptive statistics and panel data regression models, estimated with pooled data. Due to missing data for certain companies over the years, an unbalanced panel was used. The generic econometric model for the tests conducted is represented in the following equation:

$$ESG_{i,t+1} = \beta_0 + \beta_1 PROV_{i,t} + \beta_2 AT_{i,t} + \beta_3 ROA_{i,t} + \beta_4 ROE_{i,t} + \beta_5 ALAV_{i,t} + \beta_6 SEG_{i,t} \sum_{j=1}^{10} \gamma_j * SETOR_j$$

$$+ \sum_{t=2014}^{2022} \theta_t * ANO_t + \varepsilon_{i,t}$$

Where: *ESG* represents the ESG score; *PROV* represents the metrics used to measure provisions; *AT* represents the natural logarithm of total assets; *ROA* represents return on assets; *ROE* represents return on equity; *ALAV* represents the degree of leverage; *SEG* represents the listing segment; *SETOR* represents the business sectors; *ANO* represents the year; the coefficients for the variables are given by *β*, *γ*, and *θ*; *i* represents the companies; *t* represents the period; *j* represents the sector category; *ε* represents the error term.

For robustness purposes, to address potential issues arising from endogeneity, the models were re-estimated using the two-stage least squares method, with the inclusion of instrumental variables. The independent variables of interest, corresponding to the absolute value of recognized provisions, the ratio between the total value of recognized provisions and total assets, and the dummy variable identifying the recognition of provisions, were instrumented using a first-order time lag, in accordance with the procedures adopted by Borges (2022) and Santos (2022).

4 Presentation and Analysis of Results
4.1 Descriptive Statistics
In Table 2, it is possible to observe the descriptive statistics related to the types of provisions and ESG scores found in the companies during the analysis period.

Table 2
Descriptive statistics of observations by type of provision and ESG scores

Provisions	Mean	Standard deviation	Minimum	Median	Maximum
PPREV	181,950.81	360,477.65	0.00	23,279.85	2,563,658.47
PCIVI	151,182.26	513,789.89	0.00	6,492.83	5,641,418.31
PBENE	96,741.96	378,505.20	0.00	0.00	2,524,936.07
PAMBI	26,854.65	100,619.52	0.00	0.00	954,492.28
PROVT	3,715,358.76	16,336,946.43	0.00	60,6297.80	213,465,360.00
PROVT_AT	0.05	0.06	0.00	0.03	0.52
ESG	51.34	20.57	1.03	53.95	91.06
ENV	46.47	27.39	0.00	49.88	95.90
SOC	53.76	23.19	1.50	56.72	96.72
GOV	52.98	21.77	0.83	54.80	94.86

Notes: PPREV = pension provisions; PCIVI = civil provisions; PBENE = employee benefit provisions; PAMBI = environmental provisions; PROVT = total amount of provisions; PROVT_AT = total provisions relative to Assets (%); values in thousands of Reais, adjusted for inflation, except for PROVT_AT; ESG = ESG score; ENV = environmental score; SOC = social score; GOV = governance score; N = 526.

It is important to highlight that the total amount of provisions includes, in addition to those specified in Table 2, provisions for taxes, restructuring, and warranties. The analysis of the information regarding the total provisions relative to assets (%) reveals a relatively low range of values, reaching a maximum of 0.52% and a mean of 0.05%. These results can be justified by the fact that the research includes large companies, in which provisions are diluted relative to the size of the assets.

The ESG, environmental, social, and governance scores show considerable variation between their minimum and maximum scores. This demonstrates the diversity of practices and performances among the analyzed companies. Additionally, it is observed that the mean ESG score (51.34) is positive and above the midpoint (50 points) of the scale used by LSEG Data & Analytics, suggesting that the analyzed companies tend to have practices and policies aligned with sustainability, social responsibility, and good governance criteria.

4.2 Relationship between the recognition of provisions and ESG performance
The relationship between provisions, measured by monetary value, and ESG performance reveals aspects of financial management and corporate responsibility of companies, as evidenced in Table 3.

Table 3
Provisions measured by monetary value and ESG performance

Variable	ESG	ENV	SOC	GOV
PROVT	1.09E-06	1.18E-06	1.27E-07	2.11E-06[***]
AT	5.87[***]	7.84[***]	7.31[***]	0.41
ROA	0.20	0.22	0.27[*]	0.07
ROE	0.02	0.08	0.02	-0.04
ALAV	5.92E-04	6.33E-03[*]	-9.60E-04	-3.70E-03
SEG	10.49[***]	7.85[***]	9.68[***]	15.57[***]
Constant	-52.61[**]	-89.93[***]	-67.34[***]	31.33
Year	Yes	Yes	Yes	Yes
Sector	Yes	Yes	Yes	Yes
Obs.	526	526	526	526
Average VIF	2.00	2.00	2.00	2.00
R²	0.29	0.34	0.28	0.15

Notes: *** significant at 1%, ** significant at 5%, and * significant at 10%; PROVT = total provision; AT = Assets; ROA = Return on Assets; ROE = Return on Equity; ALAV = Leverage; SEG = Listing segment; ESG = ESG score; ENV = environmental score; SOC = social score; GOV = governance score; VIF = Variance Inflation Factor. The results were consistent in robustness tests with instrumental variables, estimated using the two-stage least squares method.

Regarding the variables of interest, the total provisions showed a positive effect only on the governance score, supporting hypothesis H4 for this form of provision measurement. This means that companies with recognized provision amounts tend to have better governance performance, i.e., they tend to

have more actions related to transparency, responsibility, and ethics. The other hypotheses (H1, H2, and H3) were not supported for this form of provision measurement.

When comparing the finding with the prior literature presented in the theoretical framework, its alignment with the findings of Acar and Ozkan (2017) is observed. Acar and Ozkan (2017) demonstrated that the size of the board of directors influences the recognition of provisions. Thus, if the board of directors constitutes a dimension of corporate governance, the result presented in Table 3, specifically the positive relationship between the recognition of provisions and the governance score, is consistent with the findings of the previous study.

Still in Table 3, it is verified that company size has a positive relationship with ESG performance. When evaluating the aspects separately, it is noted that company size has a positive relationship with environmental and social performance. This can be attributed to the fact that larger organizations generally have more financial, technological, and human resources to invest in and disclose sustainable and environmentally and socially responsible practices. Therefore, company size can serve as an indicator of its commitment to environmental and social performance.

Profitability, measured by ROA, shows a positive relationship only with social performance. The level of corporate governance, represented by the listing segment, exhibits a positive relationship with ESG, environmental, social, and governance performance. In turn, more leveraged companies are those that show better environmental performance, but they do not appear to be those with better ESG, social, and governance performance.

These findings corroborate studies on the determinants of disclosure, more specifically, the determinants of ESG performance, such as Drempetic et al. (2019), Crespi and Migliavacca (2020), Sharma et al. (2020), Elafify (2021), and Rahman and Alsayegh (2021), which found that variables such as company size, profitability, and leverage are related to ESG performance or ESG scores. On the other hand, they partially contradict the results of Ribeiro et al. (2019) regarding corporate governance, as they found that being listed in the Novo Mercado segment has no significant effect on the environmental disclosure score.

In Table 4, the representativeness of provisions relative to total assets and its relationship with ESG performance is elucidated.

Table 4
Provisions relative to assets and ESG performance

Variable	ESG	ENV	SOC	GOV
PROVT_AT	34.21**	59.70***	11.57	33.28
AT	6.88***	8.91***	7.42***	2.39*
ROA	0.17	0.17	0.26*	0.02
ROE	0.03	0.10*	0.02	-0.04
ALAV	6.34E-04	6.54E-03*	-8.96E-04	-3.87E-03
SEG	9.80***	7.27***	9.65***	13.99***
Constant	-69.09***	-108.28***	-69.42***	0.17
Year	Yes	Yes	Yes	Yes
Sector	Yes	Yes	Yes	Yes
Obs.	526	526	526	526
Average VIF	1.69	1.69	1.69	1.69
R²	0.29	0.35	0.28	0.14

Notes: *** significant at 1%, ** significant at 5%, and * significant at 10%; PROVT_AT = total provisions relative to assets; AT = Assets; ROA = Return on Assets; ROE = Return on Equity; ALAV = Leverage; SEG = Listing segment; ESG = ESG score; ENV = environmental score; SOC = social score; GOV = governance score; VIF = Variance Inflation Factor. The results were consistent in robustness tests with instrumental variables, estimated using the two-stage least squares method.

The results presented in Table 4 indicate that, when evaluating provisions measured by monetary value, the total amount of provisions is significant for the governance score. However, when evaluating provisions relative to assets, no significant effect is identified for the same governance score, but rather for the overall ESG score and the environmental score. In other words, when using a relative measure of provisions, the result supports hypotheses H1 and H2.

It is observed that company size has a positive relationship with ESG performance, and it is also significant when evaluating the scores individually across the environmental, social, and governance pillars. Another particularity observed in the econometric model is the evaluation of ROE, which showed significance for the environmental score. However, it is noted that the results presented in Table 4, when considering the variables ROA, leverage, and corporate governance, exhibited the same behavior identified in Table 3.

Finally, it is considered that the existence of recognized provisions may influence a company's ESG performance. The results can be visualized in Table 5.

Table 5
Existence of provisions and ESG performance

Variable	ESG	ENV	SOC	GOV
PROV_D	-2.92	-5.97	-5.73	3.45
AT	7.00***	9.13***	7.58***	2.33*
ROA	0.18	0.20	0.27*	0.04
ROE	0.01	0.07	0.02	-0.05
ALAV	2.74E-04	5.89E-03*	-1.17E-03	-4.02E-03
SEG	9.85***	7.45***	10.17***	13.38***
Constant	-66.96***	-104.15***	-66.44***	-0.77
Year	Yes	Yes	Yes	Yes
Sector	Yes	Yes	Yes	Yes
Obs.	526	526	526	526
Average VIF	1.67	1.67	1.67	1.67
R²	0.28	0.34	0.28	0.13

Notes: *** significant at 1%, ** significant at 5%, and * significant at 10%; PROV_D = total provision by dummy; AT = Assets; ROA = Return on Assets; ROE = Return on Equity; ALAV = Leverage; SEG = Listing segment; ESG = ESG score; ENV = environmental score; SOC = social score; GOV = governance score; VIF = Variance Inflation Factor.

In Table 5, it is observed that there were no statistically significant relationships when considering the variable of interest, provision, measured by a dummy variable. Thus, the existence or absence of recognized provisions, measured by the provision dummy, is not related to ESG, environmental, social, and governance performance, making it impossible to draw inferences about the hypotheses for this form of provision measurement. For the control variables, the results of this model follow the same line of significance as those found in Table 4.

The results of these analyses partially contradict the findings of Ribeiro et al. (2019), who examined environmental provisions in relation to the environmental disclosure score. Ribeiro et al. (2019) found that companies with environmental provisions in their balance sheets tend to disclose more environmental information, that the magnitude of the environmental provision matters less than its presence in the disclosure score, and that the environmental provision dummy was the second most relevant variable in explaining the level of environmental disclosure.

4.3 Relationship between types of recognized provisions and ESG pillars

Next, the relationships between the types of provisions and the pillars that constitute the ESG acronym were analyzed, focusing on the environmental and social aspects. Environmental provisions were related to the environmental pillar (performance). In turn, social provisions, which in this study encompass pension, civil, and employee benefit provisions, were associated with the social dimension (performance).

Environmental provisions were considered independent variables of interest separately in three models (environmental provision measured by monetary value; environmental provision relative to assets; and the existence of environmental provision assessed by a dummy variable). For all three models, the dependent variable was the environmental score. The results of the relationships between environmental provisions and environmental performance can be observed in Table 6.

Table 6
Environmental provisions and performance

Variable	ENV	ENV	ENV
PAMBI	-8.03E-05**		
PAMBI_AT		-16.91	
PAMBI_D			5.78**
AT	9.01***	8.96***	8.77***
ROA	0.19	0.20	0.22
ROE	0.07	0.07	0.07
ALAV	4.84E-03	6.07E-03*	-7.80E-03**
SEG	6.75**	6.81**	7.36***
Constant	-107.14***	-106.96***	-105.71***
Year	Yes	Yes	Yes
Sector	Yes	Yes	Yes
Obs.	526	526	526
Average VIF	1.68	1.66	1.69
R²	0.34	0.34	0.34

Notes: *** significant at 1%, ** significant at 5%, and * significant at 10%; PAMBI = environmental provisions; PAMBI_AT = environmental provisions relative to Assets; PAMBI_D = total provision by dummy; AT = Assets; ROA = Return on Assets; ROE = Return on Equity; ALAV = Leverage; SEG = Listing segment; ENV = environmental score; VIF = Variance Inflation Factor. The results were consistent in robustness tests with instrumental variables, estimated using the two-stage least squares method.

It is inferred that environmental provisions, when measured by their monetary value, showed a negative relationship with the environmental score. On the other hand, when measured by the dummy variable, the relationship found was positive. The ratio of environmental provisions to total assets was not statistically significant. The variation in the results of environmental provisions suggests sensitivity in the relationship between the recognition of these provisions and environmental performance.

The negative interpretation, when considering the monetary value, may be associated with potential expenses or environmental liabilities, meaning that in some situations, companies may inflate their numbers and create excess reserves to cover future environmental impacts, which can negatively affect the company's environmental performance. On the other hand, the positive interpretation, when evaluated by the dummy variable, may indicate that the mere disclosure or recognition of such environmental provisions, even without considering an explicit monetary value, reflects a transparent and committed stance by the company toward environmental issues, positively impacting its score in this aspect. In this sense, there is evidence consistent with hypothesis H5.

These results corroborate the findings of Ribeiro et al. (2019), reinforcing that companies that recognize environmental provisions tend to demonstrate a higher level of environmental disclosure. Thus, the studies converge in finding that the presence of environmental provisions is positively associated with greater corporate commitment to disclosing information on environmental issues.

Regarding social provisions, these were considered independent variables of interest separately in three models (social provision measured by monetary value; social provision relative to assets; and the existence of social provision assessed by a dummy variable). In all three models, the dependent variable was the social score. The results obtained can be seen in Table 7.

Table 7
Social provisions and performance

Variable	SOC	SOC	SOC
PROVS	6.29E-06***		
PROVS_AT		151.17*	
PROVS_D			6.02***
AT	6.65***	7.57***	7.40***
ROA	0.30*	0.29*	0.27*
ROE	0.03	0.03	0.02
ALAV	1.30E-03	3.46E-04	1.21E-03
SEG	10.85***	10.05***	9.68***
Constant	-58.70***	-73.24***	-72.70***
Year	Yes	Yes	Yes
Sector	Yes	Yes	Yes
Obs.	526	526	526
Average VIF	1.81	1.68	1.67
R²	0.29	0.29	0.29

Source: Authors' elaboration. Notes: *** significant at 1%, ** significant at 5%, and * significant at 10%; PROVS = social provisions; PROVS_AT = social provisions relative to Assets; PROVS_D = total provision by dummy; AT = Assets; ROA = Return on Assets; ROE = Return on Equity; ALAV = Leverage; SEG = Listing segment; SOC = social score; VIF = Variance Inflation Factor. The results were consistent in robustness tests with instrumental variables, estimated using the two-stage least squares method.

As shown in Table 7, the results indicated that social provisions, across all three measurement forms, maintain a positive and significant relationship with the social score. These results suggest that pension, civil, and employee benefit provisions have a positive influence on the social performance of companies. This implies that the recognition of social provisions, with financial implications, encourages greater disclosure of benefits to society, interpreted as an effort to legitimize corporate actions and compensate for social litigation, highlighting the benefits offered to the community. Thus, hypothesis H6 is supported by the results.

4.4 Robustness tests

To address potential issues arising from endogeneity, robustness tests were conducted with the inclusion of instrumental variables in the models, which were estimated using the two-stage least squares method. The independent variables of interest, corresponding to the absolute value of recognized provisions, the ratio between the total value of recognized provisions and total assets, and the dummy variable identifying the recognition of provisions, were instrumented using a first-order time lag, in accordance with the procedures adopted by Borges (2022) and Santos (2022). The results reported in the previous sections were confirmed in the robustness tests conducted.

5 FINAL CONSIDERATIONS

The objective of this study was to examine the relationship between the recognition of provisions and the environmental, social, and governance (ESG) performance of Brazilian companies listed on B3, using data from the period of 2014 to 2022.

It was observed that variables traditionally used in studies on the determinants of ESG performance, such as size (Drempetic et al., 2019; Crespi & Migliavacca, 2020; Sharma et al., 2020; Elafify, 2021; Rahman & Alsayegh, 2021), profitability (Crespi & Migliavacca, 2020; Elafify, 2021; Chung et al., 2024), leverage (Drempetic et al., 2019; Elafify, 2021), and the level of corporate governance, represented by the listing segment (Ribeiro et al., 2019), showed a statistically significant positive relationship with ESG performance or with at least one of its performance dimensions (environmental, social, and governance) in the econometric models used.

Regarding the independent variables of interest, related to the recognition of provisions, the main results indicate a positive relationship between the recognition of provisions and environmental and governance performance. Social provisions are positively related to social performance, while environmental provisions show a negative relationship with environmental performance when measured by their monetary value and a positive relationship when measured by dummy variables. The evidence partially corroborates the studies by Ribeiro et al. (2019) and Ribeiro et al. (2022), in the sense that companies that recognize environmental provisions are more likely to demonstrate a higher level of environmental disclosure.

These findings provide insights for managers and accountants, guiding decisions regarding the recognition of provisions and promoting transparent disclosure practices. In the academic realm, it fills a gap by providing empirical evidence on the relationship between the recognition of provisions and corporate characteristics, going beyond disclosure aspects. It also expands the literature by adding provisions, representing liabilities of various natures, such as environmental, social, and regulatory, to the set of determinants of ESG performance.

As limitations of this study, it is noted that the results are based on a specific sample of companies listed on B3 with ESG scores, within a defined period, which prevents the generalization of the conclusions to other contexts. Additionally, the variables used may not capture all possible determinants of ESG performance, suggesting the need to consider other variables in future research. Another limitation relates to the lack of definition regarding which provisions can be aligned with governance, which restricts the ability to establish a relationship between the recognition of provisions and governance performance, highlighting the need for further investigation.

It is noteworthy that, to advance this field of research, it would be interesting to expand the analysis to include companies from other countries or markets, in order to verify whether the results obtained are consistent across different contexts. Furthermore, exploring other ESG metrics and examining how they might be influenced by the recognition of provisions could further enrich the understanding of the relationships between sustainable practices and accounting.

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NOTES

Larissa Ribeiro Soares, Denise Mendes da Silva, Dermeval Martins Borges Júnior

AUTHORSHIP CONTRIBUTION
Conception and elaboration of the manuscript: L. R. Soares, D. M. Silva
Data collection: L. R. Soares, D. M. Silva, D. M. Borges Júnior
Data analysis: L. R. Soares, D. M. Borges Júnior
Discussion of results: L. R. Soares, D. M. Silva
Review and approval: D. M. Silva, D. M. Borges Júnior

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