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Environmental, social, and governance (ESG) performance and earnings management: evidence from the brazilian stock market

Desempeño en environmental, social y governance (ESG) y gestión de resultados: evidencias en el mercado accionario brasileño

Desempenho *environmental, social and governance* (ESG) e gerenciamento de resultados: evidências no mercado acionário brasileiro

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Abstract

Purpose: The objective of this study is to analyze the influence of Environmental, Social, and Governance (ESG) performance on earnings management in the Brazilian stock market.

Methodology: Using a sample of 717 observations from 96 companies listed on Bolsa, Brasil, Balcão (B3) from 2010 and 2022, earnings management was estimated through two methods: accrual-based (EM-A) and real activities-based earning management (EM-R). ESG performance was measured using the LSEG Data & Analytics platform score, which applies a proprietary methodology to rate companies on a scale from 0 to 100. The econometric analysis was conducted using Ordinary Least Squares (OLS) with robust standard error corrections and fixed effects for year and sector.

Results: The findings indicate ESG performance does not influence earnings management overall. However, when breaking down the ESG components, corporate governance shows a significant negative effect on EM-A, indicating that stronger corporate governance reduces incentives to manipulate accounting earnings. Additionally, social performance has a significant negative impact on EM-R, suggesting that higher corporate social responsibility reduces earnings manipulation through real activities.

Contributions of the Study: Thus, the study seeks to provide support for governments to develop public policies and regulatory mechanisms aimed at transparency and sustainability; for companies to improve their governance and compliance systems; and for investors to incorporate ESG criteria into their decisions, contributing to the mitigation of conflicts of interest in the market.

Keywords: ESG; Earnings Management; Brazilian Stock Market.

Resumen

Objetivo: El objetivo de este estudio es analizar la influencia del desempeño en Environmental, Social y Governance (ESG) sobre la gestión de resultados en el mercado accionario brasileño.

Metodología: Con una muestra de 717 observaciones de 96 empresas listadas en la Bolsa, Brasil, Balcão (B3) entre 2010 y 2022, la gestión de resultados se estimó mediante dos métodos: basado en acumulaciones contables (GR-A) y basado en actividades reales (GR-R). El desempeño ESG se midió a través del puntaje de la plataforma LSEG Data & Analytics, que emplea una metodología propia para clasificar a las empresas en una escala de 0 a 100. El análisis econométrico se realizó mediante Mínimos Cuadrados Ordinarios (MCO) con corrección de errores estándar robusta y efectos fijos de año y sector.

Resultados: Los resultados muestran que el desempeño ESG no afecta la gestión de resultados de las empresas en general. Sin embargo, al descomponer los componentes del ESG, se observa que la gobernanza tiene un efecto negativo significativo sobre el GR-A, lo que indica que una mejor gobernanza corporativa disminuye los incentivos para manipular los resultados contables. Además, el desempeño social tiene un impacto negativo y significativo sobre el GR-R, señalando que una mayor responsabilidad social empresarial reduce la manipulación de los resultados a través de actividades reales.

Contribuciones del Estudio: Así, el estudio busca ofrecer insumos para que los gobiernos desarrollen políticas públicas y mecanismos regulatorios orientados a la transparencia y la sostenibilidad; para que las empresas mejoren sus sistemas de gobernanza y cumplimiento; y para que los inversionistas incorporen criterios ESG en sus decisiones, contribuyendo a la mitigación de conflictos de interés en el mercado.

Palabras clave: ESG; Gestión de Resultados; Mercado Accionario Brasileño.

Resumo

Objetivo: O objetivo deste estudo é analisar a influência do desempenho *Environmental, Social and Governance* (ESG) no gerenciamento de resultados no mercado acionário brasileiro.

Metodologia: Com uma amostra por 717 observações de 96 empresas listadas na Bolsa, Brasil, Balcão (B3) entre 2010 e 2022, estimou-se o gerenciamento de resultados por meio de dois métodos: o baseado em *Accruals* (GRA) e o baseado em atividades reais (GRR). O desempenho ESG é medido pelo *score* da plataforma LSEG Data & Analytics, que utiliza uma metodologia própria para classificar as empresas em uma escala de 0 a 100. A análise econométrica, realizada por Mínimos Quadrados Ordinários (MQO) com correção de erro padrão robusto e efeitos fixos de ano e setor.

Resultados: Os resultados mostram que o desempenho ESG não afeta o gerenciamento de resultados das empresas, no entanto, ao separar os componentes do ESG, observa-se que a governança tem um efeito negativo significativo sobre o GRA, indicando que uma melhor governança corporativa diminui os incentivos para manipular os lucros contábeis. Além disso, o desempenho social tem impacto negativo e significativo sobre o GRR, apontando que uma maior responsabilidade social das empresas reduz a manipulação dos lucros por meio de atividades reais.

Contribuições do Estudo: Assim, o estudo busca fornecer subsídios para que os governos desenvolvam políticas públicas e mecanismos regulatórios voltados à transparência e sustentabilidade; para que as empresas aprimorem seus sistemas de governança e c*ompliance*; e para que investidores incorporem critérios ESG em suas decisões, contribuindo para a mitigação de conflitos de interesse no mercado.

Palavras-chave: ESG; Gerenciamento de resultados; Mercado acionário brasileiro.

1 Introduction

This study uses an integrated perspective to examine the environmental, social, and governance aspects that influence corporate performance (Sharma et al., 2020), consolidating them into the concept of Environmental, Social and Governance (ESG), developed by the United Nations Environment Programme in 2004 to establish a benchmark for evaluating companies' performance in terms of sustainability and social responsibility (Cheng et al., 2023).

The problem leads to two possible faces intrinsic to the universe of practices that shape this instrument. On the one hand, it invites reflection on its role in the context of the financial market, in which voluntary disclosure by listed companies can contribute to economic and financial performance, reducing costs and improving efficiency (Broadstock et al., 2021; Conca et al., 2021; Habib, 2023). In addition to it, it is considered that actions encompassed in ESG tripod denote companies' concern beyond profit maximization, increasing brand value and reputation in the market (Harymawan et al., 2021).

It is agreed with the perspective according to which, in practice, the disclosure of these practices constitutes a broader process, characterized by the pressure of interest groups on companies vis-à-vis the need to demonstrate Corporate Social Responsibility (CSR), acting, in effect, in generating value for companies (Chouaibi & Zouari, 2022; Habib, 2023), which is in line with the stakeholder theory approach.

On the other hand, the real nature of these activities is questioned, as they may be permeated by opportunism and discretionary actions. Specifically, the assumption is that ESG practices actually constitute an instrument for earnings management by agents who seek to maximize their utility.

Earnings management involves manipulating financial statements with the purpose of achieving specific targets, generally in contexts marked by agency conflicts (He et al., 2022).

One of the most recurrent practices is accrual-based earnings management, which is based on accounting estimates related to realized transactions (Saleh et al., 2023). Another strategy used by managers is earnings management through real activities, which changes financial results based on operational decisions, without directly resorting to accounting estimates (Chen & Hung, 2021).

At the threshold of this debate, part of the empirical literature has revealed ESG model best practices are related to the reduction of information asymmetry and ethical perspective improvements, resulting in a lower propensity for earnings management (Cheng et al., 2023; Garcia-Sanchez & Garcia-Meca, 2017; Lee, 2017; Mao, Wang & Lin, 2024; Saleh, Abu Afifa & Alkhwaja, 2025; Soeprajitno et al., 2024; Sun et al., 2024; Suteja et al., 2016; Velte, 2019).

While other studies draw attention to fragile governance mechanisms and the disclosure of environmental and social information as rhetoric and/or marketing with the objective of preserving the status quo and making use of actions that intensify conflicts of interest (Ben

Amar & Chakroun, 2018; Garcia-Sanchez & Garcia-Meca, 2017; Martínez-Ferrero et al., 2016; Velayutham, 2018).

Given these contradictory pieces of evidence, it becomes necessary to deepen the investigation of the relationship between ESG practices and earnings management. Thus, this research seeks to answer the following research question: **What is the influence of Environmental, Social and Governance (ESG) performance on earnings management in the Brazilian stock market?** Thus, the objective of this study is to analyze the influence of Environmental, Social and Governance (ESG) performance on earnings management in the Brazilian stock market.

To achieve it, the methodological strategy encompassed a sample of 717 observations from 96 companies listed on the Brazilian Stock Exchange, Brasil, Bolsa, Balcão (B3), from 2010 and 2022, estimating earning management through two methods: accrual-based (AEM) and real activities-based (REM). ESG performance is measured by the score from the LSEG Data & Analytics platform. The econometric analysis was carried out using Ordinary Least Squares (OLS) with robust standard error correction and fixed effects for year and sector.

This research aims to fill a gap in the theoretical research, especially regarding the national literature on the subject. It analyzes how each aspect of ESG performance scores influences companies' engagement in earnings management practices, both through accruals and real activities, in emerging markets, based on a sample of Brazilian companies listed on the stock exchange.

By connecting ESG agenda to accounting literature, the study seeks to contribute to the development of more comprehensive analytical models that consider non-financial factors as potential influences on the quality of accounting information. Moreover, it may offer a conceptual basis for new regulatory frameworks focused on transparency and governance, and it broadens ESG research by proposing an approach oriented not only toward reputation or symbolic disclosure, but also toward its strategic function in accounting and managerial decision-making.

From a practical standpoint, the study results may support companies in restructuring their governance and compliance processes, contributing to mitigating opportunistic practices associated with earning management. For investors, the findings provide input for assessing informational risks and incorporating ESG criteria into capital allocation decisions, promoting choices more aligned with social and environmental responsibility. There are also implications for governments and regulatory agencies, which may benefit from empirical evidence when drafting ESG disclosure regulations, strengthening oversight mechanisms, and establishing incentives for adopting more transparent and sustainable business practices, especially in institutional contexts still in consolidation, such as Brazil.

2 Literature Review

2.1 ESG Performance and Earnings Management

There are several theories that seek to understand how companies' ESG performance relates to earnings management, including stakeholder theory, agency theory, legitimacy theory, and signaling theory (Chouaibi & Zouari, 2022). These approaches offer different perspectives on the motivations of companies in communicating social, environmental, and governance practices, particularly regarding value creation and the management of external perceptions. In this study, stakeholder theory is used as the analytical lens.

According to this theory, developed by Freeman (1984), companies must take into account the interests and demands of various groups that influence or are affected by their actions, such as shareholders, creditors, employees, customers, government, media, and society (Park et al., 2014). These groups are called stakeholders and form a heterogeneous coalition that supports the existence of the company (Freeman, 1984).

This perspective differs from agency theory (Jensen & Meckling, 1976; Ross, 1973), which argues that the company should be concerned only with the interests of shareholders and creditors, who are the providers of capital.Therefore, stakeholder theory advocates a broader and moral perspective of corporate responsibility. So, the company should seek to satisfy the expectations and needs of its various audiences, aiming to harmonize economic and social interests, which may favor an appropriate reporting of financial and non-financial information (Amel-Zadeh & Serafim, 2018).

Furthermore, stakeholder theory proposes the company should consider the impacts of its decisions and actions on the groups affected by them, seeking to minimize harm and maximize benefits for all. In doing so, the company can build a positive reputation and a relationship of trust with its stakeholders, which may generate competitive and sustainable advantages in the long term (Bozzolan et al., 2015).

Thus, it is assumed managers aligned with stakeholder theory engage increasingly in ESG activities, valuing their heterogeneous stakeholders and consequently disclosing more relevant financial and non-financial reports for decision-making (Velayutham, 2018). Therefore, it is assumed that companies oriented toward ESG practices have fewer incentives to manage their accounting results (Chih et al., 2008).

This occurs because such companies have a long-term vision and seek to build relationships of trust and cooperation with their stakeholders (Pathak & Gupta, 2022). These companies also tend to use more transparent and reliable disclosure policies, reducing information asymmetry and the risk of conflicts of interest (Palacios-Manzano et al., 2021), since low earnings quality does not reflect stakeholders' interests (Velayutham, 2018).

In this regard, empirical studies analyzing the relationship from ESG performance and earning management indicate mixed and contradictory results. However, most research consistent with stakeholder theory has shown a negative relationship among ESG and earning management, suggesting that companies with better ESG performance tend to have a lower propensity to manipulate their results (Cheng et al., 2023; Garcia-Sanchez & Garcia-Meca, 2017; Lee, 2017; Mao, Wang & Lin, 2024; Saleh, Abu Afifa & Alkhwaja, 2025; Soeprajitno et al., 2024; Sun et al., 2024; Suteja et al., 2016; Velte, 2019).

On the other hand, with some specific exceptions, studies have found a positive or no relationship among ESG and earning management, indicating companies with better ESG performance may use earning management as a way to signal social responsibility or avoid regulatory sanctions (Garcia-Sanchez & Garcia-Meca, 2017; Velayutham, 2018).

In addition to it, research has analyzed the influence of a company's ESG orientation on its incentives to disclose financial information, considering the trade-off among accrual-based earning management (AEM) and real earning management (REM). However, previous studies, such as Kim et al. (2012), have not yet emphasized that an ESG component may have a differentiated impact on AEM and REM. In this context, the first two hypotheses of this study propose that:

H1: ESG performance is associated with a lower degree of accrual-based earning management.

H2: ESG performance is associated with a lower degree of real activities earning management.

2.2 ESG Dimensions and Earnings Management

Within the scope of the dimensions which make up ESG model, studies suggest that better sustainable practices act as inhibitors of earnings management (Oh et al., 2020), which also contributes to reducing information asymmetry. Furthermore, companies that implement such actions may be perceived as entities that disclose and, therefore, value the quality of accounting information, reducing the practice of earning management (Kim et al., 2012; Pyo & Lee, 2013).

Expanding on these findings, research highlights that companies adopting such practices improve organizational processes and enhance financial performance indicators (Weber, 2017). It is also understood environmentally responsible companies tend to be more conservative in their decisions, disclosing more accurate information to stakeholders (Gerged et al., 2023).

Nevertheless, environmental responsibility may lead to the phenomenon of greenwashing, in which companies' commitment to such actions becomes rhetorical, that is, distancing themselves from concrete practices and, moreover, disseminating information that does not reflect reality (Martínez-Ferrero et al., 2016), which tends to foster earning management.

In this context, a critical perspective has developed, associating the disclosure of sustainable actions with the preservation of the power of large corporations and their managers, who use such mechanisms as a means to maintain their positions and increase compensation, ultimately mitigating the practice of earning management (Prior et al., 2008; Gargouri et al., 2010). Added to this debate is the fact that companies facing environmental problems tend to engage in earning management as a way to mitigate public and stakeholder pressure (Ben Amar & Chakroun, 2018).

In turn, the incorporation of socially responsible aspects, such as the guarantee of human rights, the structure of labor relations, security in transactions and the bonds created with consumers, in addition to involvement and concern with the community, tend to mitigate earnings management since they aim to maintain the companies' reputation (Ben Amar & Chakroun, 2018). It should also be considered that actions of this kind reflect concern for stakeholders, so it is expected that companies will avoid practices that put the trust of these users at risk.

Despite the importance of the social and environmental spheres, the literature focuses its attention on corporate governance aspects, largely due to its internal role in promoting an efficient, transparent organizational structure that is closer to companies' decision-making and control (Velte, 2019).

Thus, governance mechanisms such as committees, board structure (independence, diversity, size) and aligned incentive packages (with emphasis on the forms of remuneration granted) contribute to strengthening internal controls and reviewing accounting practices (Benkraiem et al., 2017; Yasser et al., 2014; Ntim et al., 2015). Given the above, the following research hypotheses are proposed:

H3: Governance performance has a stronger negative impact on accrual-based earning management compared with Environmental and Social performance.

H4: Governance performance has a stronger negative impact on real activities earning management compared with Environmental and Social performance.

3 Methodological Procedures

3.1 Research Universe and Sample

The research covered companies listed on the Brazilian Stock Exchange, Brasil, Bolsa, Balcão (B3), with data obtained from the LSEG Data & Analytics databases. However, in defining the final sample, some exclusions were made. First, companies belonging to the financial sector, such as banks, insurance companies, and investment funds, were removed, since they present specific characteristics that could influence the results. Next, companies with negative equity, negative assets, and those that did not present complete data on the variables of interest for the study were eliminated.

After applying these criteria, the final sample comprised 717 observations on 96 companies during the period from 2010 to 2022. The choice of the year 2010 is because, from that date, publicly traded companies in Brazil began to use International Financial Reporting Standards (IFRS) as mandatory for the preparation and disclosure of their financial statements, which allows greater comparability and consistency of the data.

3.2 Variables and Measures

3.2.1 Dependent Variables: Earnings Management

In this research, both AEM and REM were considered in the analyses, in line with previous studies (Kim et al., 2019; Velte, 2019), and separate regression analyses were conducted for the two types of earnings management, AEM and REM. To measure AEM proxy, the methodology developed by Kothari et al. (2005) was used, which is based on a modified version of the Jones model (Dechow et al., 1995), additionally considering the Return on Assets (ROA). This methodology is widely used in the earnings management literature (Velayutham, 2018; Trimble, 2018; Velte, 2019; Viana Jr. et al., 2023). Equation 1 shows the econometric model estimated to obtain the total accruals of the companies in the sample.

$$TA_{it} = \alpha_0 + \beta_1 \frac{1}{Ais_{it-1}} + \beta_2 \frac{(\Delta S_{it} - \Delta REC_{it})}{Ais_{it-1}} + \beta_4 \frac{PPE_{it}}{Ais_{it-1}} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (1)$$

To calculate the total accruals (TA_{it}) of each company i in year t, the difference between working capital and total assets at the end of the period is divided by total assets at the beginning of the period (Ais_{it-1}). Subsequently, these TA are submitted to a regression using a series of explanatory variables, such as the percentage variation in sales (ΔS_{it}), the percentage variation in accounts receivable (ΔREC_it), the proportion of gross fixed assets (PPE_{it}), and the return on assets (ROA_{it}), all in relation to Ais_{it-1}.

The constant term of the regression represents the normal accruals expected for company *i* in year *t*, and the residual (ε_{it}) corresponds to discretionary accruals, reflecting

managerial decisions. The regression is carried out by year to account for interannual disparities that may affect the level of provisions.

To estimate total REM, the method proposed by Roychowdhury (2006) was used, which developed an aggregate model combining different REM indicators to capture the main forms of earnings manipulation through real activities. These indicators are: abnormal operating cash flow (Abn _CFO), which measures the deviation of operating cash flow from the expected level; abnormal discretionary expenses (Abn_DisExp), which measure the deviation of discretionary expenses from the expected level; and abnormal production costs (Abn_Prod), which measure the deviation of production costs from the expected level. These are calculated according to Equations (2), (3), and (4), respectively.

$$\frac{PROD_{it}}{Ais_{it-1}} = \alpha_0 + \beta_1 \frac{1}{Ais_{it-1}} + \beta_2 \frac{S_{it}}{Ais_{it-1}} + \beta_3 \frac{\Delta S_{it}}{Ais_{it-1}} + \beta_4 \frac{\Delta S_{it-1}}{Ais_{it-1}} + \varepsilon_{it} \quad (2)$$

$$\frac{CFO_{it}}{Ais_{it-1}} = \alpha_0 + \beta_1 \frac{1}{Ais_{it-1}} + \beta_2 \frac{S_{it}}{Ais_{it-1}} + \beta_3 \frac{\Delta S_{it}}{Ais_{it-1}} + \varepsilon_{it} \quad (3)$$

$$\frac{DISX_{it}}{Ais_{it-1}} = \alpha_0 + \beta_1 \frac{1}{Ais_{it-1}} + \beta_2 \frac{S_{it}}{Ais_{it-1}} + \varepsilon_{it} \quad (4)$$

For each company *i* in year *t*, production costs (PROD) are defined as the sum of the cost of goods sold and the change in inventories from year *t-1* to *t*. Operating cash flow (CFO) is calculated indirectly as net income minus total accruals. Discretionary expenses (DISX) are defined as the sum of research and development (R&D) expenses and selling, general, and administrative (SG&A) expenses. All other variables are as defined above.

The expected values of these variables were obtained through cross-sectional regressions for each year. The residuals from these regressions represent the REM measures. To facilitate interpretation, following the approach of previous studies (Cohen & Zarowin, 2010; Kim et al., 2019; Trimble, 2018; Velte, 2019; Viana Jr. et al., 2023; Zang, 2012), the signs of ABN_CFO and ABN_DISX were inverted, so that higher values of these variables indicate a higher likelihood of cash flow manipulation and reduction of discretionary expenses, respectively. The three REM proxies were then summed into a single variable that reflects the general degree of corporate engagement in REM practices.

3.2.2 Independent Variable: ESG Performance

Regarding the independent variables, the research focused on four main metrics: (i) the combined ESG score, (ii) the environmental score, (iii) the social score, and (iv) the governance score. These scores were obtained from LSEG Data & Analytics. The scores range from 0 to 100, where 0 represents the worst performance and 100 the best.

The higher the ESG score, the greater the level of commitment and adoption of ESG practices by companies. The choice of LSEG ESG scores was based on their wide acceptance and use in the academic literature, as demonstrated by Aydoğmuş et al. (2022), Chouaibi & Zouari (2022), Duque Grisales & Aguilera-Caracuel (2021), Giannopoulos et al. (2022), Grimaldi et al. (2020), and Velte (2019).

LSEG stands out as a provider of one of the most comprehensive ESG datasets on a global scale. The LSEG ESG methodology encompasses 10 themes and 3 pillars that reflect the main aspects of corporate sustainability. The themes are: emissions, innovation, and resource

use (environmental pillar); human rights, workforce, product responsibility, and community (social pillar); and shareholders, management, and CSR strategy (governance pillar).

For each theme, LSEG applies more than 600 criteria based on international standards such as the United Nations Global Compact Principles, the United Nations Sustainable Development Goals (SDGs), and the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises (LSEG, 2025).

LSEG obtains most ESG data from public and reliable sources, such as corporate websites, annual reports, and other official company documents. When necessary, LSEG also requests information directly from companies through specific questionnaires. After collecting the data, LSEG conducts a rigorous audit and standardization process to ensure data quality, consistency, and comparability. Based on these data, LSEG calculates ESG scores for each company, indicating their performance and exposure to ESG risks. The LSEG ESG scores are updated quarterly and are available for more than 10,000 companies worldwide (LSEG, 2025).

3.2.3 Control Variables

To mitigate potential impacts of other variables on the dependent variable, numerous studies have incorporated control variables in their analyses (Chouaibi & Zouari, 2022). Thus, consistent with prior literature (Almeida et al., 2009; Cupertino et al., 2016; Du et al., 2015; Hochberg, 2012; Joia & Nakao, 2014; Kim et al., 2012; Lai & Tam, 2017; Velte, 2019; Viana Jr. et al., 2023), this research incorporates a diversified range of control variables encompassing both firm-specific and environmental characteristics to deepen the understanding of the phenomenon under investigation.

Firm size (SIZE) is a factor that affects the interests of stakeholders regarding financial and non-financial reporting, as demonstrated by previous studies (Kim et al., 2012). Larger firms tend to engage more in earnings management (Du et al., 2015) because they are more subject to market demand, which creates greater pressure on managers to meet specific targets. Therefore, SIZE was included in the model using the natural logarithm of total assets at year-end (Viana Jr. et al., 2023). On the other hand, shareholders and analysts, aware of this, are more motivated to monitor managers' discretionary practices (Hochberg, 2012). In this context, SIZE may have a positive or negative effect on earnings management.

Another variable considered was the Market-to-Book ratio (MTB), which is expected to have a positive effect on earnings management, as evidenced by previous studies (Kim et al., 2012). Companies with a high MTB indicate that agents have high expectations about their future performance, as the market recognizes information not captured by accounting due to its standards (Almeida et al., 2009). Thus, managers have an incentive to meet shareholder expectations while maximizing their own utility.

To assess firms' accounting performance, Return on Assets (ROA) was used, corresponding to net income divided by total assets at year-end. Previous literature has shown a negative relationship between earnings management and ROA, suggesting that managers tend to manipulate results when financial performance is unsatisfactory, to improve the company's image (Joia & Nakao, 2014; Cupertino et al., 2016).

Another relevant control variable is financial leverage (LEV), defined as the ratio between long-term debt and total assets. Companies with high levels of indebtedness may have incentives to manipulate earnings to avoid breaching contractual clauses (Lai & Tam, 2017). The percentage change in sales (ΔS) was also included, as it reflects firm growth. According to Velte (2019), firm growth has a negative effect on earnings management because expanding

firms may have less need to manipulate results. In this sense, Table 1 presents a summary of all variables used in the study, as well as their definitions.

Table 1

Summary of Variables

Variables	Description / Formula
Dependent Variables	
AEM	Based on Dechow et al. (1995), modified Jones model (1991), to measure discretionary accruals, additionally considering Return on Assets (Kothari et al., 2005).
REM	Based on Roychowdhury (2006). Sum of abnormal production costs (ABN_PROD), abnormal discretionary expenses (ABN_DISX) multiplied by –1, and abnormal operating cash flows (ABN_CFO) multiplied by –1.
Independent Variables	
ESG	LSEG proprietary score measuring the extent to which a company meets environmental, social, and governance issues. Ranges from 0 to 100; higher scores indicate better ESG performance.
E	LSEG proprietary score for environmental performance. Higher scores indicate better environmental performance.
S	LSEG proprietary score for social performance. Higher scores indicate better social performance.
G	LSEG proprietary score for governance performance. Higher scores indicate better governance performance.
Control Variables	
SIZE	Natural logarithm of total assets at year-end.
MTB	Market-to-book ratio (market value divided by book value).
ROA	Net income divided by total assets at year-end.
LEV	Total liabilities divided by total assets at year-end.
ΔS	Percentage change in sales.

Source: *Research data.*

3.3 Statistical Model and Data Analysis Technique

To test the research hypotheses, this study employed two regression models, one for each dependent variable. As the independent variables, corresponding to the ESG scores, exhibit a high degree of correlation among themselves, separate models were estimated for each to avoid multicollinearity problems that could compromise the validity of the results. Thus, eight different models were run—four for each dependent variable—aiming to estimate the coefficients accurately and reliably. In Equations (5) and (6), AEM_{it} and REM_{it} are the dependent variables, respectively; X_{it} represents the set of independent variables composed of ESG scores; $\sum CV_{it}$ represents control variables; and $\varepsilon_{it}$is the error term for company *i* in period *t*.

$$AEM_{it} = \alpha + \beta_1 . X_{it} + \emptyset_n . \sum CV_{it} + \varepsilon_{it} \quad (5)$$

$$REM_{it} = \alpha + \beta_1 . X_{it} + \emptyset_n . \sum CV_{it} + \varepsilon_{it} \quad (6)$$

The approach adopted to estimate the equations involved the application of Ordinary Least Squares (OLS). To mitigate potential issues related to cross-sectional and serial correlations, the robust standard error method was applied, adjusting the regression coefficient estimators. Additionally, to control for specific sector and year effects on the dependent variables, fixed effects were included in the regression for each of these categories. The data

were organized as an unbalanced panel, allowing the use of all available observations, even when some sectors or years contained missing data. This strategy aims to reduce information loss and increase the efficiency of the estimators.

4 Results and Analysis

4.1 Descriptive Statistics and Correlation Matrix

Table 2 presents a summary of the variables used in the estimation models, encompassing dependent, independent, and control variables. It is noteworthy that the Accrual-Based Earnings Management (AEM) variable was expressed in absolute values, while Real Earnings Management (REM) was expressed in nominal values. The Environmental, Social and Governance (ESG) performance variables were standardized on a scale from 0 to 1 to align with the scale of the other variables. In addition, to mitigate possible effects caused by outliers, the winsorization technique was applied to adjust the values of continuous variables at the 1% and 99% levels. This procedure helped reduce the influence of outliers on the analysis results.

Table 2
Descriptive Statistics of Variables

Variables	Mean	Median	Std. Deviation	Minimum	Maximum
AEM	0,0608	0,0422	0,0675	0,0001	0,6080
REM	-0,0314	0,0929	0,2525	-1,4377	1,0264
ESG	0,5146	0,5377	0,1990	0,0126	0,9166
E	0,4904	0,5208	0,2445	0	0,9418
S	0,5391	0,5674	0,2377	0,0065	0,9640
G	0,5131	0,5228	0,2151	0,0083	0,9422
SIZE	23,7031	23,6170	1,2298	20,7541	27,6183
MTB	2,7019	1,6529	4,0225	0,0309	66,2560
ROA	0,0755	0,06758	0,0700	-0,2753	0,4906
LEV	0,6067	0,1722	0,6026	0,0949	0,9910
ΔS	0,1884	0,1060	1,1106	-0,7379	28,4927
Obs.	717				

Source: *Research data.*

The mean value of the Accrual-Based Earnings Management (AEM) and Real Earnings Management (REM) variables was 0.0608 and -0.0314, respectively. Therefore Brazilian companies tend to use AEM more than REM to manage accounting information. However, the variability of AEM and REM among companies, represented by the standard deviation, suggests there are significant differences in the way and intensity with which managers manipulate accounting information, depending on the specific characteristics of each firm. This result is consistent with the existing literature, which shows that earnings management is a common practice in different economic and cultural contexts, as observed in studies such as Grimaldi et al. (2020) in Italy, Velte (2019) in Germany, Wu et al. (2016) in China, and Kim et al. (2012) in the United States.

Regarding the companies' performance in relation to environmental, social, and governance (ESG) criteria, it is noted that the average ESG score of the companies analyzed is 0.5146, which means that, on average, they have practices in these areas that are at an intermediate level of quality and commitment. However, there is great variation among companies, since some of them present high ESG levels (0.9166), while others present very low levels (0.0126). Among the ESG components, the social dimension obtained the highest

average score (0.5391), indicating that companies tend to pay more attention to social issues than to environmental (0.4904) and governance (0.5131) issues. These results are consistent with previous research that also pointed out greater emphasis on the social dimension of ESG (Velte, 2019).

With regard to the control variables, SIZE shows an average of 23.7031, with a median of 23.6170. These values indicate that the distribution of firm size is relatively symmetrical around the mean, that is, there is not a large difference between larger companies (27.6183) and smaller ones (20.7541). Another control variable used was MTB, which measures the relationship between market value and book value of the companies. This index reflects investors' expectations regarding future firm growth. The arithmetic mean of MTB in the sample was 2.7019, meaning that, on average, companies are valued higher in the market than in their balance sheets.

ROA variable, which measures the return on assets of companies, presented an average of 0.0755 during the analyzed period. This means that, on average, firms were able to generate positive profit from their resources. LEV variable represents the relationship among debt and equity of firms. The higher the leverage, the greater the level of debt relative to equity. Very high leverage may indicate a high financial risk, as firms may have difficulties in meeting their financial obligations. In this study, the average leverage was 0.6067, suggesting most companies are not excessively indebted and have a reasonable level of solvency.

ΔS variable measures the percentage variation in company sales from one year to another. This is a measure of firm growth and dynamism. In the analyzed period, ΔS was 0.1884, indicating that companies' sales grew, on average, 18.84% from one year to the next. This is a moderate result, showing that firms are expanding in the market. However, the standard deviation of ΔS was 1.1106, revealing a large dispersion in the data. This means there is a significant difference among the sales growth rates of different companies. Some firms may have shown very high growth, while others may have faced difficulties or even sales declines.

Table 3 shows Pearson correlation coefficients obtained for each pair of variables. The data indicate the existence of a positive and significant association among the environmental (E), social (S), and governance (G) variables that compose ESG. This positive correlation also implies a risk of multicollinearity, that is, the possibility the explanatory variables are highly correlated with each other, affecting the estimation of regression coefficients.

To avoid this problem, it was decided to estimate a separate model for each ESG dimension, considering only one of them as an independent variable in each case, while controlling for the other relevant variables affecting firm performance. So, it was possible to evaluate the isolated impact of each ESG dimension on corporate performance without compromising the validity of the results.

Table 3

Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) GRA	1										
(2) GRR	-0,16**	1									
(3) ESG	-0,02	0,01	1								
(4) E	0,02	-0,00	0,85***	1							
(5) S	-0,02	0,03	0,92***	0,74***	1						
(6) G	-0,07**	0,03	0,67***	0,33***	0,49***	1					
(7) SIZE	-0,02	0,21***	0,51***	0,51***	0,47***	0,25***	1				
(8) MTB	0,03	-0,22***	-0,07**	-0,03	-0,09**	-0,07*	-0,15***	1			
(9) ROA	0,19***	-0,27***	0,09***	0,17***	0,12***	-0,07**	-0,01	0,06*	1		

(10) LEV	0,01	0,38***	0,13***	0,14***	0,12***	0,06*	0,29***	0,12***	-0,25***	1	
(11) ΔS	0,05	0,02	-0,06*	-0,06*	-0,06*	0,00	-0,02	-0,02	0,04	0,01	1

Note: ****, **, * represent statistical significance at 1%, 5%, and 10%, respectively.*
Source: *Research data.*

The results demonstrate a negative and statistically significant correlation (r = -0.16**, p < 0.05) between AEM and REM. This association suggests an inverse relationship between these two forms of earnings management. Therefore, the higher AEM level, the lower the REM level, and vice versa. This finding indicates managers tend to opt for one of these methods over the other, depending on the circumstances and objectives of the firm (Ipino & Parbonetti, 2017).

When exploring the relationships among AEM and ESG components, it is noted the correlation with governance performance is negative and statistically significant (r = -0.07**, p < 0.05). Thus companies which engage more in AEM tend to have weaker corporate governance structures, which can negatively affect their image and value in the eyes of investors and society (Velte, 2019). On the other hand, no significant relationship was found between REM and ESG performance variables.

The results also show a positive and significant correlation between AEM and ROA (r = 0.19***, p < 0.01), indicating that firms with higher ROA also tend to present higher AEM. Another variable that exhibited a positive and statistically significant relationship with AEM was LEV (r = 0.38***, p < 0.01), suggesting that more indebted companies tend to adopt more AEM practices, possibly to avoid credit restrictions or contractual sanctions.

For REM, there is a positive and significant correlation with SIZE (r = 0.21***, p < 0.01), suggesting that larger companies tend to use more REM to manipulate their results. In addition, REM presents negative and significant relationships with MTB (r = -0.22***, p < 0.01) and ROA (r = -0.27***, p < 0.01). This indicates that firms with lower MTB and lower ROA tend to use more REM.

4.2 Regression Analysis

To verify the proposed research hypotheses, eight econometric models were constructed, whose results are presented in Table 4. The models in columns 1 to 4 use Accruals as the measure of earnings management through accounting choices (AEM). The models in columns 6 to 8 use real activities as the measure of earnings management through operational decisions (REM). Each model analyzes the relationship between ESG performance and earning management, controlling for other relevant variables.

Table 4
Relationship between ESG performance and earnings management

	AEM				**REM**			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
ESG	-0,0185				-0,0636			
E		0,0048				-0,0157		
S			-0,0159				-0,073**	
G				-0,0254**				-0,0127
SIZE	-0,0012	-0,0032	-0,0013	-0,0020	0,0062	0,0031	0,0076	0,0017
MTB	0,0006	0,0006	0,0006	0,0006	-0,0120***	-0,0120***	-0,0120***	-0,0121***
ROA	0,2050***	0,1943***	0,2064***	0,1917***	-0,7390***	-0,7508***	-0,7240***	-0,7661***
LEV	0,0391**	0,0383**	0,0394**	0,0388**	0,4493***	0,4472***	0,4512***	0,4470
ΔS	0,0030***	0,0032***	0,0029***	0,0032***	0,0021	0,0026	0,0017	0,0028
Constant	0,0765	0,1126*	0,0752	0,1059*	-0,3797***	-0,3285***	-0,415***	-0,2910***

Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	22,60%	22,42%	22,61%	22,97%	43,54%	43,39%	43,70%	0,4338
VIF	1,22	1,24	1,20	1,12	1,22	1,24	1,20	1,12
Obs.			717					

Note: ****, **, * represent statistical significance at 1%, 5%, and 10%, respectively.*
Source: *Research data.*

The data analysis revealed that the aggregated ESG score did not show a statistically significant relationship with earnings management, either through AEM or REM. Therefore, hypotheses H1 and H2, which predicted a negative association between ESG performance and the level of earning management through Accruals and real activities, were not confirmed.

However, when ESG components were analyzed separately, the governance dimension showed a negative and significant relationship with AEM. This result confirms hypothesis H3, according to which governance would have the strongest and most negative impact on earnings management through Accruals compared to the other pillars.

This finding is in accordance with stakeholder theory, according to which internal control and supervision mechanisms reduce agency conflicts (Freeman, 1984). It is known corporate governance comprises a set of mechanisms and policies that act with the objective of restricting opportunistic practices and promoting greater regularity in the behavior of agents (Huynh, 2020).

In the context of the elements that are part of corporate governance, the Board of Directors stands out, being responsible, among other aspects, for evaluating decision-making and monitoring the internal actions of companies (Ntim et al., 2015). So, it is assumed board independence acts as greater monitoring of actions (Benkraiem et al., 2017).

In turn, it is expected that in situations in which the members of the Board are also present on the Boards of other companies, there is greater exchange of information and knowledge production (Stuart and Kim, 2010), restricting earnings management. Additionally, a kind of mimetism may be promoted regarding market practices and strategies (Haunschil and Beckman, 1998), which can also contribute to reducing discretionary actions.

Still within the scope of Boards, it is suggested that a smaller number of members may make actions and monitoring less dispersed, improving communication and coordination among agents (Ntim et al., 2015). Complementarily, gender diversity itself tends to mitigate these practices, considering that the literature points out that women have greater risk aversion (Yasser et al., 2014). Other mechanisms related to corporate governance, such as the existence of committees, especially external ones, focused on the supervision and auditing of disclosed information, can also explain the restriction of earnings management practices.

In the case of earnings management through real activities, it was found that only the social dimension presented a negative and statistically significant relationship with REM, rejecting hypothesis H4. This indicates that companies with greater engagement in social practices, such as respect for human rights, quality in labor relations, and community responsibility, tend to avoid operational strategies aimed at manipulating results.

Aspects such as guaranteeing human rights, for example, raise the degree of reputation and image of companies, so that managers tend to avoid earnings management practices precisely to preserve this characteristic (Ben Amar & Chakroun, 2018). Good labor relations policies, with representation in instances of the company's organizational structure, tend to create more effective controls in monitoring actions (Ben Amar & Chakroun, 2018).

It should also be noted companies guided by the principles of honesty, integrity, and fairness seek to inhibit earnings management and produce more credible information for

stakeholders (Ben Amar & Chakroun, 2018). Finally, companies that promote actions aimed at establishing bonds of trust and community development have no incentives for earnings management (Ben Amar & Chakroun, 2018).

Regarding the control variables, contrary to what has been identified in the literature (Kim et al., 2012; Almeida et al., 2009), a negative relationship was found for market-to-book, which may indicate that the company's appreciation in the market reflects alignment between the main and the agent, reducing the probability of earning management practices through real activities.

The accounting financial performance of companies, measured by ROA, presented a positive relationship with AEM and a negative relationship with REM. If, on the one hand, manipulation may occur when this indicator is weak (Joia & Nakao, 2014; Cupertino et al., 2016), on the other, in situations in which the company's situation is more favorable, earnings management is expected to be mitigated.

On the other hand, it was confirmed that a higher degree of indebtedness of companies tends to lead to earnings management as an instrument, for example, to fulfill contractual obligations (Lai & Tam, 2017). The positive relationship found with sales growth, differently from what was postulated by some studies (Velte, 2019), denotes that companies use earning management to preserve their financial results in the market.

In summary, the findings reveal the effects of ESG performance on earning management do not manifest uniformly among the three pillars. Governance and social responsibility demonstrated an effect on the mitigation of manipulation practices, while environmental performance did not exert statistically relevant influence. These results highlight the importance of disaggregating ESG performance into its main pillars, thus basing it on specific results.

Therefore, the findings reinforce the importance of corporate policies aimed at the solidity of governance systems and effective social engagement. For managers, these components can function as mechanisms to contain reputational and regulatory risks. For investors, the critical and disaggregated analysis of ESG components contributes to the assessment of the quality of accounting information. Finally, for regulatory bodies, they suggest the need for initiatives that encourage substantive and transparency-oriented ESG practices.

5 Final Considerations

The objective of this study was to analyze the influence of Environmental, Social and Governance (ESG) performance on earning management in the Brazilian stock market. The analysis covered 717 observations from 96 companies that trade their shares on B3, from 2010 to 2022. The results indicate ESG performance has no impact on companies' earning management, that is, there is no evidence that firms with greater commitment to environmental, social, and governance issues are more or less likely to manipulate accounting earnings.

However, when separating ESG components, it is observed governance performance has a significant negative effect on AEM, indicating that better corporate governance reduces the incentives to manipulate accounting earnings through accruals.Social performance has a negative and significant impact on REM, suggesting that greater corporate social responsibility leads managers to reduce earnings manipulation through real activities.

To the best of our knowledge, this is the first study to investigate the effect of each dimension of ESG performance scores on companies' engagement in earning management practices, both through accruals and real activities, in emerging markets, using a sample of Brazilian listed companies as reference. Thus, it contributes to the advancement of research in

this area and fills the gap in previous studies, which have focused on other contexts and presented inconclusive results. Regarding practical implications, the results of this investigation may be particularly relevant for institutions, governments, companies, and investors.

However, these contributions are subject to three main limitations related to the constraints imposed by conducting such research. The first limitation concerns the sample size, due to the availability of ESG scores in the Brazilian context. Therefore, future studies may expand the sample to allow for comparisons in other contexts. It is also worth noting the exclusion of companies from the financial sector, such as banks, insurance companies, and investment funds, due to their specific regulatory characteristics. Nevertheless, these firms usually present high levels of ESG disclosure, and it is recommended that future research analyze this segment specifically.

In addition to it, the study is limited to the analysis of ESG performance based on the LSEG dataset. Thus, future research could use different measures to capture each dimension of ESG scores and better explore the association between each dimension and earning management practices. Furthermore, this study does not include other measures of earning quality. Therefore, subsequent research could incorporate other indicators, such as earning smoothing, conservatism, or loss avoidance.

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