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The impact of analyst monitoring on ESG performance in the Brazilian stock market

O impacto do monitoramento de analistas sobre o desempenho ESG no mercado acionário brasileiro

El impacto del monitoreo de analistas sobre el desempeño ESG en el mercado accionario brasileño

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Abstract
This study aims to examine the role of analyst monitoring on the Environmental, Social, and Governance (ESG) performance of Brazilian public companies. To achieve this, regressions were conducted using panel data from 2010 to 2022, with the final sample consisting of 136 Brazilian public companies for which data were available from Refinitiv Eikon. The main findings suggest that analyst monitoring can serve as an effective external corporate governance mechanism in the Brazilian context, enhancing the ESG performance of public companies, particularly in the corporate governance dimension. In this way, this study fills a gap in Brazilian literature by providing, to date, the first empirical evidence of the effect of analyst monitoring on companies' ESG performance. Ultimately, it offers practical insights for investors who are increasingly considering ESG criteria in their investment decisions.
Keywords: Analyst Monitoring; ESG Performance; Corporate Governance

Resumo
O presente estudo tem como objetivo investigar o papel do monitoramento de analistas no desempenho *Environmental, Social and Governance* (ESG) de companhias abertas brasileiras. Para atingir o objetivo proposto, foram estimadas regressões com dados em painel ao longo do período 2010-2022, sendo a amostra final composta por 136 companhias abertas brasileiras com dados disponíveis pela Refinitiv Eikon. Os principais resultados indicam que o monitoramento dos analistas pode ser considerado um eficaz mecanismo externo de governança corporativa no contexto brasileiro, capaz de otimizar o desempenho ESG das companhias abertas, especialmente na dimensão de governança corporativa. Nesse sentido, este estudo preenche uma lacuna na literatura nacional ao fornecer, até o presente momento, a primeira evidência empírica sobre o efeito do monitoramento de analistas no desempenho ESG das companhias. Por fim, contribui de forma prática para investidores, que cada vez mais têm considerado critérios ESG ao tomar decisões de investimento.
Palavras-chave: Monitoramento de Analistas; Desempenho ESG; Governança Corporativa

Resumen
El presente estudio tiene como objetivo investigar el papel del monitoreo de los analistas en el desempeño *Environmental, Social and Governance* (ESG) de las empresas públicas brasileñas. Para lograr el objetivo propuesto, se estimaron regresiones con datos de panel durante el período 2010-2022, siendo la muestra final compuesta por 136 empresas públicas brasileñas con datos disponibles de Refinitiv Eikon. Los principales resultados indican que el monitoreo de analistas puede considerarse un mecanismo externo de gobierno corporativo eficaz en el contexto brasileño, capaz de optimizar el desempeño ESG de las empresas públicas, especialmente en la dimensión de gobierno corporativo. En este sentido, este estudio llena un vacío en la literatura nacional al proporcionar, hasta la fecha, la primera evidencia empírica sobre el efecto del monitoreo de los analistas en el desempeño ESG de las empresas. Por último, contribuye de forma práctica a los inversores, que cada vez consideran más criterios ESG a la hora de tomar decisiones de inversión.
Palabras clave: Monitoreo de Analistas; Desempeño ESG; Gobernanza Corporativa

1 Introduction

Environmental, Social, and Governance (ESG) issues are increasingly influencing companies' decisions on which practices to adopt and what returns to expect from society and its information users. The concept of ESG encompasses a wide range of issues, from carbon emissions to labor practices and corruption, leading to the development of criteria and practices that guide businesses' roles and responsibilities in relation to environmental, social, and corporate governance factors (Irigaray & Stocker, 2022).

The recent debate on ESG issues in the corporate sphere has been influenced by the growing international awareness of the sustainability agenda (Zairis et al., 2024), in which pressure from policymakers, investors, stakeholders, and other information users has impacted companies' attitudes toward their ESG performance (Aldowaish et al., 2022). Consequently, several studies have been conducted in this area to understand which (and how) internal and external factors influence companies' ESG performance over the years (Crace & Gehman, 2023; Martiny et al., 2024).

Considered an external corporate governance mechanism that provides an additional layer of monitoring to internal mechanisms (Bai et al., 2023; Khatri, 2023), analyst monitoring is one factor that can lead to increased ESG performance. According to Zhang and Wu (2023), analyst monitoring has a positive influence on the ESG performance of publicly traded companies in China, especially in the environmental and social dimensions. This finding is particularly relevant in emerging markets, characterized by a weak legal and regulatory environment, where the cost of non-compliance is low, allowing companies greater leeway to manipulate information about their ESG practices.

The Brazilian capital market also finds itself in this context, since, in addition to being characterized as a country with weak legal protection for investors (Crisóstomo et al., 2020; Martins et al., 2017), it also has a higher level of engagement in the manipulation of ESG practices (i.e., greenwashing) when compared to developed markets, such as the United States (Maria et al., 2024). Therefore, it is considered relevant to investigate factors that enable companies to achieve increased ESG performance, aiming not only to improve transparency and socio-environmental responsibility but also to strengthen investor trust and the trust of other information users.

In this context, empirical studies have investigated factors associated with ESG performance in publicly traded companies, such as board characteristics (Ferreira et al., 2023), capital structure (Campos-Rasera et al., 2021), and company life cycle stages (Moreira et al., 2023). However, a gap that remains in the literature is whether (and how) analyst monitoring influences companies' ESG performance. Therefore, to fill this gap, this study aims to investigate the role of analyst monitoring in the ESG performance of publicly traded Brazilian companies.

It is essential to note that this research was conducted in a distinct context, providing additional evidence on the relationship between analyst monitoring and ESG performance, which differs from the study by Zhang and Wu (2023). Regarding the context, it is found that the maturity and sophistication of the Brazilian financial market in relation to ESG issues are still low (Souza, 2023) and develop more slowly compared to other emerging markets, such as China, India, and South Africa (Melo & Fontgalland, 2023).

In this sense, the present study appears to contribute to the corporate governance literature, which has suggested researching the effects of external corporate governance mechanisms in emerging markets, given the scarcity of empirical evidence on the effectiveness of these mechanisms (Bueno et al., 2018).

Additionally, this study contributes to the literature on ESG performance in the Brazilian context, which, although incipient, has primarily focused on the benefits generated by ESG pillars, with limited emphasis on the determinants of ESG performance. Thus, this study fills a gap in the literature by providing, to date, the first empirical evidence on the effect of analyst monitoring on the ESG performance of Brazilian public companies.

Finally, this study is considered to contribute to investors, who have increasingly made investment decisions based on ESG performance criteria (Park & Jang, 2021; Zhang & Wu, 2023), as well as to policymakers and other information users, who may consider incentives to promote or strengthen analyst

monitoring as part of corporate governance strategies, encouraging public companies to increase the transparency and quality of information provided to analysts.

2 Theoretical Framework

2.1 ESG Performance

ESG performance has become increasingly relevant in emerging markets, reflecting a gradual shift in how investors and analysts evaluate companies. Increasingly, investors are incorporating ESG information as a crucial component of their communication with target companies, paying particular attention to ESG performance levels when making investment decisions (Zhang & Zhang, 2024). In Tunisia, for example, the integration of ESG information into investment decisions is still in its infancy, but there are already signs of growing awareness among stakeholders. This "developing awareness" has driven research investigating how different ESG dimensions impact capital allocation decisions in a context little explored in the international literature (Khemir et al., 2019).

However, it is essential to note that the literature in this area presents evidence of divergences in how market agents evaluate ESG dimensions. On the one hand, shareholders demonstrate greater sensitivity to environmental information; on the other hand, brokers and financial analysts tend to underestimate its importance. Furthermore, novice investors, especially those with a long-term focus, attribute greater weight to the social dimension in their decisions, suggesting that the perceived value of ESG factors is not homogeneous across different investor profiles. These findings highlight the importance of adapting ESG strategies to the target audience's profile and the market's level of maturity (Khemir et al., 2019).

In the Brazilian stock market, the increasing awareness of the importance of ESG among investors and other stakeholders has led companies to reevaluate their strategies in order to gain greater organizational legitimacy (Rigon et al., 2023). However, supporting the view of divergence in how stakeholders assess ESG dimensions, as discussed by Khemir et al. (2019), Neder et al. (2023) provide empirical evidence that Brazilian publicly traded companies show more maturity and adopt more practices related to the governance pillar compared to the social and environmental dimensions.

However, in general terms, there is a growing incentive among Brazilian publicly traded companies to engage in sustainable practices, even in companies with ownership structures that are largely uninvolved with the interests of other stakeholders (Mazzioni et al., 2024). This phenomenon suggests that, despite the challenges to be overcome, given the absence of ESG regulations, a positive trajectory is developing, in which companies are beginning to recognize the value of sustainable practices as an integral part of their long-term business strategies, given the growing number of companies adopting mechanisms to reduce deforestation, carbon emissions, corruption, and poor working conditions for employees, among others (Farias & Barreiros, 2020).

In India, although ESG performance is widely recognized as an essential non-financial criterion for corporate valuation, the risk of greenwashing has undermined investor confidence. This distrust is intensified when sustainable actions appear to merely respond to regulatory pressures, without precise fidelity to the message these actions convey (Banerjee & David, 2024). However, sustainable practices such as green innovation, sustainable construction, and environmental certifications have been associated with reduced financial leverage, especially in environments with better institutional governance, demonstrating a relationship between ESG practices and long-term financial strength in the BRICS countries (i.e., Brazil, Russia, India, and China) (Jesuka et al., 2025).

In the European Union, there is evidence that financial institutions incorporate both ESG performance and its disclosure into credit decisions. Companies with better ESG practices tend to access credit at lower costs, an effect that is intensified in countries with a greater stakeholder orientation (Eliwa et al., 2021). The environmental dimension stands out, having the most significant impact on reducing the cost of debt, reflecting the growing concern about climate risks and sustainability in financial markets.

Beyond the financial benefits, consistent ESG practices also protect companies' reputations and reduce the impact of controversies. Adverse ESG-related events can directly impact a corporation's image, financial performance, and access to credit (Jesuka et al., 2025; Shakil, 2024). Therefore, it is essential for companies of all sizes to develop robust, transparent, and contextualized ESG strategies.

Along these lines, analyst monitoring can act as an external pressure and incentive mechanism, fostering greater company commitment to sustainable practices and reinforcing the credibility of information disclosed to the market. Investor attention can exert compliance pressure on listed companies, directly influencing their ESG performance and reinforcing the market's disciplinary role in this process (Zhang & Zhang, 2024).

2.2 Analyst Monitoring

The primary role of financial analysts is to forecast earnings and make investment recommendations for a company. To fulfill these roles, financial analysts must have a solid understanding of the companies they cover and the industry in which they operate. This can give them an advantage over ordinary investors in gathering and processing information that encompasses a limited and specific group of companies, often within the same industry (Yang et al., 2018).

Considering that analysts are professionals who belong to institutions independent of the companies they monitor, the literature suggests that their monitoring can be considered an effective external corporate governance mechanism (Khatri, 2023), thereby contributing to the protection of investors' interests. This perspective is corroborated by studies that demonstrate benefits from the perspective of accounting information quality, since analyst monitoring is associated with a reduction in the level of earnings management (Yu, 2008), an increase in the relevance of accounting information (Khatri, 2023), as well as more conservative accounting choices (Sun & Liu, 2011).

Analysts also play an important role in mitigating information asymmetry (Chang et al., 2006; Naqvi et al., 2021). According to Chang et al. (2006), this effect stems from the fact that analysts disclose information that is not widely known to market participants (e.g., information obtained from discussions with managers or facility visits), as well as providing complex information more understandably for less sophisticated investors. As a result of reduced information asymmetry, investors can obtain more accurate information for making resource allocation decisions within companies.

Another important role of analysts' performance is related to reducing the risk of stock price crashes. The study by He et al. (2019) shows that analyst monitoring is associated with a lower future risk of stock price crashes. This perspective is corroborated by Kim et al. (2019), who provide evidence that analyst skill is important in mitigating future crash risk, with the effect being more pronounced when more experienced analysts perform monitoring.

Regarding corporate fraud, there is no consensus on the role of analyst monitoring in reducing the likelihood of fraud. Although some studies in the area show that it contributes to discouraging corporate fraud (Chen et al., 2016; Liu et al., 2021), there is also evidence that analyst monitoring does not significantly influence the reduction of fraud incidence (Hu & Yang, 2014).

From the perspective of environmental, social, and governance issues in the corporate sphere, the study by Zhang and Wu (2023) shows that analyst monitoring improves the ESG performance of publicly traded companies in China, especially in the environmental and social dimensions, through potential channels of attracting the media's attention and conducting on-site visits.

However, Zhang and Wu (2023) emphasize the need for future studies to explore the effect of analyst monitoring on ESG performance in different contexts, in order to investigate whether this same behavior is repeated. In this sense, considering that the maturity and sophistication of the Brazilian financial market regarding ESG issues are still low (Souza, 2023) and develop more slowly compared to other emerging markets, such as China, India, and South Africa (Melo & Fontgalland, 2023), the present study aims to fill this gap in the literature by examining the influence of analyst monitoring on the ESG performance of Brazilian companies.

2.3 Research Hypothesis

Analyst monitoring can play a vital role in scrutinizing management behavior related to environmental, social, and governance issues, acting as an external governance mechanism through both direct and indirect oversight (Chen et al., 2015). Directly, by conducting on-site visits to the company, the financial analyst can observe actual operations by immersing himself in the factory, helping to gather subtle insights, such as employee morale, which are difficult to obtain from online financial reports (Cheng et al., 2016; Gao et al., 2022). Indirectly, analysts consistently review companies' financial statements, spreading information about their environmental, social, and governance performance through their recommendation reports (Yang et al., 2021).

This perspective is corroborated by Zhang and Wu (2023), who indicate that analysts have been paying greater attention to ESG performance assessment in their recommendation reports, taking into account investors' growing interest in this topic when making investment decisions. From this perspective, the authors empirically demonstrate that analyst monitoring plays a role in reducing agency conflicts and promoting increased ESG performance, particularly in the environmental and social dimensions.

In this same context, studies in the area demonstrate that financial analysts consider specific information about corporate environmental policies when preparing their reports (Jing et al., 2023), as well as aspects related to social performance (Chun & Shin, 2018), workplace safety issues, and employee well-being (Bradley et al., 2022). Analyst monitoring is considered in the literature as one of the mechanisms that helps increase companies' reputational capital, thus reducing information asymmetry between investors and managers (Chun & Shin, 2018; Zhang & Wu, 2023).

Additionally, empirical evidence suggests that governance structures and mechanisms also influence analysts' judgments and perspectives on a given company, as these aspects are considered by analysts when making investment recommendations (Gabbionetta et al., 2007; Yu, 2011). Thus, analyst monitoring can improve a company's governance structure, either by strengthening already robust governance structures (complementary effect) or by serving as a partial substitute (substitutive effect) for weaker governance mechanisms.

From this perspective, considering that analysts can act as a complementary governance mechanism, making companies increase their performance in environmental, social, and governance aspects, the research hypothesis is that:

H_1: Analyst monitoring is positively associated with companies' ESG performance.

3 Methodology

3.1 Sample Composition

The initial sample for this study includes 578 Brazilian publicly traded companies listed on the B3 - Brazilian Stock Exchange and the Over-the-Counter Market, with data available in the Refinitiv Eikon database (formerly known as Thomson Reuters Eikon). However, since Refinitiv Eikon does not provide data (missing values) on the ESG performance scores of 441 companies initially included in the sample, nor on the number of analysts monitoring each company, the final sample consists of 136 publicly traded companies. Data were collected from 2010 to 2022, using an unbalanced panel structure to reduce survivorship bias. As a result, companies did not need to be publicly traded throughout the entire period to be included. Additionally, to reduce the influence of outliers identified through boxplots, continuous variables were winsorized at the 1% level.

3.2 Variables

The dependent variable of this study is ESG performance, which represents the assessment of companies' environmental, social, and governance practices. In line with previous studies (Martiny et al., 2024; Moreira et al., 2023; Pinheiro et al., 2024), we used the aggregated ESG performance indicator provided by the Refinitiv Eikon platform as a proxy, since this is one of the primary sources for obtaining data on the ESG performance of companies globally (Pinheiro et al., 2024), and due to the greater availability of data for Brazilian companies compared to other systems (Schleich, 2022).

The ESG performance scores provided by Refinitiv Eikon are designed to transparently and objectively measure ESG performance, commitment, and effectiveness based on publicly disclosed data. They are grouped into categories that form scores for the three dimensions of the construct (E, S, and G). Environmental performance (E) is assessed through 61 indicators related to three main elements: reducing energy and water consumption through eco-efficient practices, minimizing environmental damage and emissions, and reducing environmental costs to customers resulting from new technologies and processes. Social performance (S) is quantified through 63 indicators, covering four main areas: workforce, compliance with fundamental human rights conventions, data protection, and commitment to social responsibility and business ethics. Governance performance (G) is measured through 54 indicators, encompassing critical aspects related to good corporate governance practices and equitable treatment of shareholders (London Stock Exchange Group, 2023).

The independent variable is analyst monitoring, which refers to the number of analysts covering a specific company. Consistent with the study by Zhang and Wu (2023), we measured analyst monitoring using the total number of analysts covering a company (instead of its natural logarithm) to include companies that no analyst in the sample covers. This approach reduces selection bias, as analysts may tend to cover companies with specific traits, such as larger size or higher profitability (Ali & Hirshleifer, 2020).

Finally, a series of control variables was inserted into the econometric model to mitigate potential biases, such as omitted variables. In this sense, following studies in the area (Ferreira et al., 2023; Pinheiro et al., 2024; Wen et al., 2023; Zhang & Wu, 2023), the econometric model controls for company size, growth opportunity (market-to-book), profitability, debt, ownership concentration, and company age. The measurement method for these variables, the theoretical basis, and their sources are presented in Table 1.

Table 1
Econometric Model Variables

Variable	Measurement Method	Previous Study	Source
ESG	ESG performance of company *i* in year *t*, which varies between 0 and 100 based on the score of the three combined indices (governance, environmental, and social).	Ferreira et al. (2023). Pinheiro et al. (2024)	Refinitiv Eikon
Governance	Governance performance of company *i* in year *t*, which varies between 0 and 100.	Pinheiro et al. (2024)	Refinitiv Eikon
Environmental	The environmental performance of Company *i* in year *t*, which ranges from 0 to 100.	Pinheiro et al. (2024)	Refinitiv Eikon
Social	Social performance of company *i* in year *t*, which varies between 0 and 100.	Pinheiro et al. (2024)	Refinitiv Eikon
Analyst Monitoring	The total number of analysts covering firm *i* in year *t*.	Zhang and Wu (2023)	Refinitiv Eikon
Size	Natural logarithm of total assets.	Ferreira et al. (2023), Pinheiro et al. (2024), Zhang and Wu (2023)	Refinitiv Eikon
MTB	Ratio between the company's market value and its equity value.	Ferreira et al. (2023).	Refinitiv Eikon
Profitability	Ratio between net income and equity.	Pinheiro et al. (2024)	Refinitiv Eikon

Variable	Measurement Method	Previous Study	Source
Indebtedness	Ratio between total liabilities and total assets.	Ferreira et al. (2023), Wen et al. (2023), Zhang and Wu (2023)	Refinitiv Eikon
Concentration	Ownership concentration, calculated as the difference between 1 and the percentage of free float shares of company *i* in year *t*.	Wen et al. (2023).	Refinitiv Eikon
Age	Natural logarithm of years, considering from the year the company was listed to the current year.	Wen et al. (2023). Zhang and Wu (2023)	Refinitiv Eikon

3.3 Econometric Model

To examine how analyst monitoring influences the ESG performance of Brazilian public companies, a panel data regression model, as presented in Equation 1, was estimated.

$$ESG_{i,t} = \beta_0 + \beta_1 Analyst\ Monitoring + \sum Controls_{i,t} + \mu_{i,t} \quad (1)$$

Where: ESG represents the ESG performance of company i in year t, calculated as the average of the Social, Environmental, and Governance scores obtained from Refinitiv Eikon. Analyst Monitoring represents the total number of analysts covering company i in year t. ∑Controls represents a series of control variables that may influence the dependent variable, such as Size, measured by the natural logarithm of total assets; Market-to-book (MTB), measured by the ratio of the company's market value to its equity value; Profitability, measured by the ratio of net income to equity; Debt, measured by the ratio of total liabilities to total assets; Ownership Concentration (Concentration), calculated as the difference between 1 and the percentage of the company's free float; Age, measured by the natural logarithm of years, considering the year of the company's listing to the current year.

4 Results Analysis

4.1 Descriptive Statistics

Table 2 presents the descriptive statistics for the variables used in this research. It can be observed that the analyzed companies present, on average, an ESG performance of approximately 51 points, indicating that Brazilian firms seek to adhere to environmental, social, and governance practices at an intermediate level, as evidenced by the ESG variable. This result aligns with the studies by Moreira et al. (2023) and Ferreira et al. (2023), which found overall average ESG performance scores of 49 and 44 points, respectively, in the context of Brazilian publicly traded companies.

Regarding the variation in the sample's ESG performance, a considerable gap is observed between the minimum and maximum values, given the difference between the firms that least adhere to ESG performance practices (minimum 5.41) and the firms that most use these components (maximum 89.06). This aspect is considered relevant, since companies with higher levels of ESG performance tend to be better evaluated by the market (Hendratama & Huang, 2021).

Table 2
Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
ESG	992	51.11	20.98	5.41	89.06
Analyst Monitoring	992	2.51	4.04	0	16
Size	992	23.88	1.43	20.88	28.09
MTB	992	2.59	2.74	-0.47	15.55
Profitability	992	0.12	0.28	-1.48	1.26
Indebtedness	992	0.32	0.18	0	0.87
Concentration	992	0.38	0.27	0	0.89
Age	992	17.27	15.08	0	73

Regarding the Analyst Monitoring variable, it is clear that firms have, on average, approximately two analysts monitoring each company, with a maximum of 16 professionals performing this role. This aspect is relevant since analyst monitoring can serve as a complementary governance mechanism, holding the potential to drive managers in their search for better ESG performance, as evidenced by Bai et al. (2023) and Kathri (2023).

It is also worth noting that the analyzed companies have an average size of 23.88, represented by the natural logarithm of assets, with no significant discrepancy between the minimum of 20.88 and the maximum of 28.09, a finding confirmed by the low standard deviation of this variable. Furthermore, regarding age, it is

noteworthy that the companies have an average market operating time of 17.27 years, with a range of up to 73 years.

Regarding MTB, descriptive statistics indicate that, on average, the market has valued firms with growth expectations. This is evidenced by the positive mean value of the variable (2.59), indicating that market value, which is obtained based on the share's screen price, has exceeded book value. However, it is worth noting that there are differences in how the market prices the companies analyzed, since the minimum value (i.e., -0.47) indicates that, in some cases, the market has assigned a lower value to the firm's book value, possibly reflecting distrust regarding future earnings generation.

Additionally, the correlation between the variables was analyzed using the correlation matrix, aiming to present the direction of the variables and possible signs of multicollinearity in the econometric model, as shown in Table 3. It is worth noting that Spearman's correlation was used, as the Shapiro-Wilk test indicated that the variables do not follow a normal distribution.

Table 3
Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) *ESG*	1.00							
(2) *Analyst Monitoring*	0.04	0.04						
(3) *Size*	**0.47**	**0.47**	**0.47**					
(4) *MTB*	0.05	0.05	0.05	0.05				
(5) *Profitability*	**0.09**	**0.09**	**0.09**	**0.09**	**0.09**			
(6) *Indebtedness*	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**	**0.15**		
(7) *Concentration*	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	
(8) *Age*	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**	**0.21**

Note: Coefficients in bold are significant at the 5% level.

From Table 3 although the Analyst Monitoring variable presents a coefficient indicating a low correlation (0.04) with the ESG performance proxy, the lack of statistical significance does not allow us to infer the existence of a prior correlation between the variables.

On the other hand, it is observed that the variables Size (0.477), Profitability (0.097), Indebtedness (0.15), and Age (0.21) present positive and significant coefficients in relation to the ESG performance proxy, suggesting a possible correlation between ESG performance and these variables, especially with the Size variable, as it presents a higher coefficient.

The results presented in Table 3 also indicate that Analyst Monitoring may be positively correlated with company characteristics, such as Size (0.12), Profitability (0.06), and Age (0.06), as they present significant coefficients. This suggests that larger companies, with higher profitability and/or longer market experience, may be positively correlated with financial analyst monitoring. Finally, the results presented suggest that there is no high correlation between the independent variables of the econometric model, which indicates the absence of multicollinearity.

4.2 Analysis of the Relationship between Analyst Monitoring and ESG Performance

Table 4 presents the results of the estimation proposed by Equation 1. To define the final model, the Breusch-Pagan, Chow, and Hausman tests were performed, which indicated that the estimation with the best fit for this dataset is the fixed-effects panel. Additionally, the Wald test indicated the need to estimate a model robust to heteroscedasticity, given the non-constant variance of the residuals. The results of these specification tests are presented in Table 4, as are the outputs of the final regression model.

The results in Table 4 indicate that analyst monitoring is positively associated with companies' ESG performance, indicating that the more analysts covering a company, the better its ESG performance. This positive effect is also consistent among larger companies, given the positive influence of the Size variable; however, it diverges among the most profitable companies, as the Profitability variable has a negative coefficient. This can be explained by the fact that larger companies have more resources to adopt ESG practices, but this is not necessarily related to profitability.

In this sense, the positive effect of analyst monitoring on ESG performance, as presented in Table 4, corroborates the research hypothesis proposed in this study. Thus, the results suggest that in the Brazilian stock market, analysts can serve as an effective external mechanism to promote improvements in the environmental, social, and governance (ESG) performance of publicly traded companies.

However, the research results indicate that growth opportunities, captured by the MTB variable, debt, ownership concentration, and company age, do not exert a significant influence on the ESG performance of companies, contradicting evidence from previous studies (Ferreira et al., 2023; Pinheiro et al., 2024; Wen et al., 2023; Zhang & Wu, 2023).

Table 4
Regression Analysis

Variable	(1) ESG
Analyst Monitoring	0.26* (0.16)
Size	7.75*** (2.18)
MTB	0.22 (0.28)
Profitability	-3.57** (1.38)
Indebtedness	0.19 (6.56)
Concentration	-1.94 (5.20)
Age	0.42 (0.26)
Constant	-141.50*** (50.47)
Observations	992
Companies	136
R2	0.27
Prob > F	12.45***
Breusch-Pagan test	2174.46***
Chow Test	23.93***
Hausman test	-1.03***
Wald test	2.432***

Notes: Standard errors are reported in parentheses. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Aiming to deepen the understanding of analyst monitoring on ESG performance in the Brazilian context, where ESG issues are still emerging (Souza, 2023) and develop more slowly compared to other emerging markets, such as China (Melo & Fontgalland, 2023), an additional analysis was conducted to examine the impact of analyst monitoring on each of the ESG pillars.

4.3 Additional Analysis of the Relationship Between Analyst Monitoring and Individual Pillars of ESG Performance

Aimed at enhancing the understanding of how analyst monitoring affects the ESG performance of publicly traded Brazilian companies, and aligning with the studies by Borralho et al. (2022) and Zhang and Wu (2023), an additional analysis was performed to explore the impact of analyst monitoring on each of the three ESG pillars (i.e., environmental, social, and governance). The results of this further analysis are shown in Table 5.

The results presented in Table 5 demonstrate that the effect of analyst monitoring differs across the pillars of the ESG tripod, indicating that analyst monitoring is only significant from the perspective of corporate governance performance. Thus, given the fragility of governance aspects in the Brazilian market (Crisóstomo et al., 2020; Martins et al., 2017), it appears that analyst monitoring plays a relevant role in improving this scenario.

The findings of this additional analysis diverge from those of Zhang and Wu (2023), who found a positive effect of analyst monitoring on the social and environmental pillars, but not on the corporate governance pillar. Market differences can explain this inversion, as Chinese regulators require companies to incorporate environmental protection into their corporate governance systems (Zhang & Wu, 2023), unlike the Brazilian context, where the adoption and disclosure of ESG aspects is voluntary and poorly regulated (Grodt et al., 2024; Schleich, 2022; Souza, 2023).

The limited impact of analyst monitoring on social and environmental aspects in Brazil may stem from structural and institutional factors, as Brazilian public companies are generally more advanced and engaged in governance practices than in social and environmental areas (Neder et al., 2023). Therefore, it is believed that the still developing regulatory framework, along with the dominance of voluntary reporting practices and the absence of standardized disclosure requirements, has constrained analysts' ability to effectively address the social and environmental dimensions.

Furthermore, investors' focus on traditional financial metrics may lead to a reduction in the demand for in-depth assessments of social and environmental dimensions. This perspective is presented by Banerjee and David (2024), who demonstrate that, although investors are aware of the importance of these aspects, they are often treated as secondary. Thus, given the fragile legal protection mechanisms for investors (Crisóstomo et al., 2020; Martins et al., 2017), it is natural that in the Brazilian context, analysts focus more of their efforts

on the corporate governance dimension, which may explain the preponderance of the effects identified in this pillar.

Table 5
Additional Analysis of ESG Dimensions

Variable	(1) Governance	(2) Environmental	(3) Social
Analyst Monitoring	0.76***	-0.06	0.11
	(0.22)	(0.18)	(0.23)
Size	6.57**	11.19***	7.67***
	(2.66)	(2.85)	(2.43)
MTB	0.49*	0.18	0.03
	(0.29)	(0.38)	(0.29)
Profitability	-5.10**	-2.43**	-2.73
	(1.96)	(1.21)	(1.92)
Indebtedness	5.34	-7.00	-2.39
	(6.81)	(9.18)	(9.14)
Concentration	-1.65	-1.57	-1.71
	(6.15)	(6.10)	(7.09)
Age	0.14	0.38	0.34
	(0.35)	(0.34)	(0.33)
Constant	-112.00*	-223.70***	-133.30**
	(60.42)	(65.89)	(56.20)
Observations	992	992	992
Companies	136	136	136
R2	0.23	0.18	0.13
Prob > F	9.37***	6.38***	7.41***
Breusch-Pagan test	2026.14***	1732.20***	1681.40***
Chow Test	21.16***	17.00***	16.44***
Hausman test	-59.31**	24.57***	30.10***
Wald test	4.53***	1.23***	1.133***

Notes: Standard errors are reported in parentheses. The number of firms in the GMM regression is smaller due to the exclusion of firms with only one year of data, which does not allow for the construction of valid lags for the instrumentation of endogenous variables. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

4.4 Robustness Test for Endogeneity

Additionally, a robustness test was performed to mitigate potential endogeneity issues, based on the study by Zhang and Wu (2023), which analyzed the reverse causality between ESG performance and analyst coverage. The authors suggest that companies with better ESG performance tend to attract greater analyst coverage, which highlights the possibility of reverse causality in the relationship being studied. Furthermore, the possible omission of relevant variables can lead to biased estimates, since unobserved factors can influence both analysts monitoring and ESG performance. Therefore, estimations were performed using the generalized method of moments (GMM), and the results are presented in Table 6.

The robustness test results indicate that the relationship between analyst monitoring and ESG performance remained consistent, even when endogeneity issues were mitigated. Overall, the results demonstrate that analyst monitoring has a positive influence on the ESG performance of Brazilian public companies, particularly in the governance dimension, thereby complementing the evidence of Zhang and Wu (2023) and indicating that the effect of analyst monitoring may vary depending on the context.

5 CONCLUSIONS

This study aimed to investigate the role of analyst monitoring in the ESG performance of Brazilian public companies. To this end, the final sample comprised 136 companies, for which data were available from Refinitiv Eikon, spanning the period from 2010 to 2022. Data analysis was initially performed using regression with unbalanced panel data and subsequently using the GMM method to mitigate the potential endogeneity between analyst monitoring and ESG performance.

The main findings align with the research hypothesis, suggesting that analyst monitoring has a positive influence on ESG performance. However, when analyzing the three dimensions separately, it was found that the effect is driven by the corporate governance dimension, which is significantly influenced by ESG performance. These findings are also consistent when GMM models are implemented as a means of robustness. Thus, the results of this study suggest that analyst monitoring can be viewed as an external corporate governance mechanism that incentivizes organizations to pursue improved ESG performance, particularly in the corporate governance dimension. This finding constitutes a novel contribution to the literature in this area.

Table 6
Robustness Test for Endogeneity

Variable	(1) ESG	(2) Governance	(3) Environmental	(4) Social
Analyst Monitoring	0,11**	0,33**	0,12	0,01
	(0,05)	(0,13)	(0,10)	(0,10)
Size	1,40	4,01**	2,35	1,29
	(1,54)	(1,90)	(1,72)	(1,85)
MTB	-0,01	0,32	-0,41	-0,26
	(0,18)	(0,26)	(0,30)	(0,29)
Profitability	0,91	-0,86	-0,47	2,02*
	(0,91)	(1,62)	(1,24)	(1,20)
Indebtedness	-0,20	-2,22	-1,04	2,21
	(3,97)	(5,03)	(5,45)	(6,65)
Concentration	-0,30	-3,73	-2,18	3,88
	(2,48)	(4,42)	(3,15)	(3,36)
Age	-0,04	-0,08	-0,25	0,053
	(0,10)	(0,17)	(0,18)	(0,13)
Constant	-24,28	-69,62*	-38,59	-23,26
	(34,59)	(42,00)	(37,91)	(41,95)
Observations	856	856	856	856
Companies	110	110	110	110
Prob > chi^2	451,30***	151,47***	349,84***	323,00***
AR(1)	-6,24***	-6,22***	-6,419***	-5,65***
AR(2)	0,78	1,42	0,62	1,32
Heteroscedasticity Test	97,69***	154,34***	118,53***	86,64***

Notes: Standard errors are reported in parentheses. *** indicates significance at the 1% level, ** indicates significance at the 5% level, and * indicates significance at the 10% level.

Therefore, this research contributes to the corporate governance literature, which has demanded studies on the effects of external corporate governance mechanisms in emerging markets. Additionally, this study contributes to the national literature on the determinants of ESG performance, as no studies have yet been found that examine the effect of analyst monitoring on companies' ESG performance. Thus, this study fills a gap in the literature, as it is, to date, the first to investigate the relationship between analyst monitoring and ESG performance in the Brazilian stock market.

Additionally, this study offers practical benefits to investors, as the results indicate that companies with greater analyst monitoring tend to exhibit better ESG performance, especially in the corporate governance dimension, which is crucial for investment decisions. This evidence can guide institutional investors and portfolio managers in selecting assets that are more aligned with sustainable practices and have lower governance risks.

Furthermore, policymakers may consider incentives to promote or strengthen analyst monitoring as part of corporate governance strategies, encouraging publicly traded companies to increase the transparency and quality of information provided to analysts. These measures can help reduce information asymmetries, strengthen investor confidence, and enhance the institutional environment of the Brazilian capital market.

However, it is important to emphasize that the lack of a significant effect of analyst monitoring on the social and environmental dimensions in Brazil may be related to structural and institutional factors, since the literature indicates that Brazilian public companies tend to be more mature and engaged in governance practices, compared to the social and environmental pillars. Therefore, it is considered that the still incipient regulatory framework, combined with the predominance of voluntary reporting practices and the lack of disclosure standards, has limited the adequate performance of analysts in terms of the social and environmental dimensions.

While this study complements existing research on determinants of ESG performance, it has limitations, as it was conducted in an emerging market with specific characteristics, such as the lack of regulation regarding ESG disclosure, which reduces enforcement for initiatives related to these aspects. In this sense, although methodological care was taken to minimize potential biases, it is important to recognize that the exclusion of 441 companies due to missing data on ESG performance and analyst coverage in the Refinitiv Eikon database may have introduced a selection bias, as larger, more established companies, or those with better disclosure practices, tend to remain in the sample, limiting the generalizability of the results.

An additional limitation of this study is the exclusive use of the ESG performance metric provided by Refinitiv Eikon, since studies in the area (Berg et al., 2022; Christensen et al., 2022) have pointed to significant heterogeneity among rating agencies regarding the quantification of ESG performance (e.g., Refinitiv, Sustainalytics, Kinder, Lydenberg and Domini–KLD, Moody's ESG, MSCI). This divergence stems largely from differences in the scope of the variables considered in the measurement strategies adopted and in the weights assigned to each dimension of the construct. Therefore, future studies could employ alternative ESG performance metrics to verify whether the findings converge with those presented here.

As a recommendation for future research, we also suggest using different ESG performance metrics, with data from other databases, to verify the robustness and consistency of the results. Furthermore, we believe future studies must examine the findings presented here in greater detail through a qualitative research approach, including interviews with managers and analysts of publicly traded companies. This strategy can help deepen the understanding of how analyst monitoring influences corporate governance and identify potential barriers that limit its impact on environmental and social dimensions.

Finally, it is also noted that, although the total number of analysts is a validated and widely accepted proxy in the literature for measuring analyst monitoring, it does not reflect individual characteristics of analysts, such as experience or assertiveness levels. Therefore, future studies could attempt to incorporate these factors and investigate potential moderating or mediating influences that may affect this relationship, such as industry traits or companies' ESG maturity levels.

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