

Analyst Coverage and Environmental, Social and Governance (ESG) performance: Evidence from Brazil

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Resumo/Abstract

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Modalidade/Type

Artigo Científico / Scientific Paper

Área Temática/Research Area

Tópicos Especiais de Contabilidade (TEC) / Special Topics in Accounting



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Abstract

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Keyword: Environmental, social and governance (ESG); Analyst Coverage; Brazil; Agency theory; Stakeholder theory

1 Introduction

Increasingly, stakeholders and customers demand that firms monitor sustainability performance (Rajesh et al., 2022). Policymakers and regulators are also more concerned with implementing social responsibility and environmental governance (Zhou et al., 2022). ESG performance can be a strategic firm policy to meet stakeholder demands on sustainability issues (Lozano & Martínez-Ferrero, 2022) and create value for investors and shareholders (Pacelli et al., 2022). Accordingly, capital markets and the financial sector increasingly integrate ESG factors into their business practices. For example, hedges and mutual funds committed to ESG strategies manage more than \$30 trillion (Caldeira dos Santos & Pereira, 2022). Additionally, ESG assets under management are expected to exceed \$50 trillion by 2025 (Apergis et al., 2022). Thus, more and more asset managers are incorporating ESG issues into the asset allocation process more holistic way (Refinitiv, 2022c).

ESG refers to how companies and investors integrate environmental, social, and governance concerns into their business models (Gillan et al., 2021). ESG performance is an evaluation tool that helps investors analyze environmental, social, and corporate governance performance (Tang, 2022). In this context, engagement in ESG activities sends a positive signal to the financial market, creating a better corporate reputation (He et al., 2022). Since firms seek to improve sustainable competitive advantages, they are moving from a mere environmental focus to sustainability's ethical and social side (Rajesh et al., 2022). It is worth noting that analysts increasingly notice firms' ESG commitments due to investors seeking to allocate their resources to firms with better ESG performance (Alazzani et al., 2021).

Analysts play an intermediary role between investors and companies (Wang et al., 2020) and are important in capital markets (Hinze & Sump, 2019). These convey their opinions about the performance of companies by releasing reports that enable stakeholders to have information about companies they would not otherwise get due to lack of time or experience (M. Zhang et al., 2015). Analysts play an essential role in the stock market by helping investors understand a firm's risk, performance, and prospects (Hea & Lia, 2021). In addition, higher analyst coverage can assist in monitoring the firm (Allen et al., 2016; Y. Zhang, 2021) because the greater the number of analysts trying to find information about a firm, the less likely it is that relevant information will not be incorporated. Thus the extent of analyst coverage reduces informational asymmetry (Farooq et al., 2022).

Previous studies show the influence of analyst coverage on ESG performance (Adhikari, 2016; Chun & Shin, 2018; Harjoto & Jo, 2011; Hu et al., 2021; Hussain et al., 2021; Jo & Harjoto, 2014; Lei et al., 2022; Lu & Abeysekera, 2021; Qian et al., 2019). However, to the best of our knowledge, there are no studies addressing the relationship between analyst coverage and ESG performance in Brazilian firms. Based on the above discussion, this paper aims to explore the effect of analyst coverage on ESG performance. Theoretically, the study uses agency and stakeholder theories.

The study has several contributions. First, the study expands the knowledge of how analyst coverage influences ESG performance in Brazilian firms. Our results complement previous studies that focused on countries such as China (Lei et al., 2022; Lu & Abeysekera, 2021; Y. Zhang, 2022), South Korea (Chun & Shin, 2018), and the United States (Adhikari, 2016; Hussain et al., 2021; Jo & Harjoto, 2014, 2011; Qian et al., 2019). Brazil has the fourth largest democracy in the world and the most developed stock market in Latin America (Balán et al., 2022). Renewable energy sources and hydropower dominate the power sector, with hydropower dominating the country's annual power generation (Udemba & Tosun, 2022). It is important to mention that Brazil has the largest biogas potential in the world (Kanda et al., 2022). Moreover, in the context of corporate governance, Brazil represents a weak institutional environment (Almeida & Dalmácio, 2015) with the presence of institutional voids (Parente et al., 2013; Ronconi, 2012). Institutional voids occur when market-supporting institutions are absent or inefficient (Khanna & Palepu, 1997, 2010). These voids undermine the success of firms (Liedong et al., 2020) and increase the likelihood of corruption and excessive rents for some market players (Areneke et al., 2022; Doh et al., 2017). Thus, the study extends the knowledge about analyst coverage and ESG performance of Brazilian firms. Finally, this study contributes to agency theory and stakeholder theory by indicating that analyst coverage can act to reduce principal-agent conflict and meet stakeholder demands.

The remainder of the paper is structured as follows: In Section 2, we present a review of the relevant literature and hypotheses. Section 3 discusses the research design. Section 4 reports the empirical results. Finally, Section 5 concludes the study.

2 Literature review and hypotheses development

2.1 Brazilian context

Brazil is an emerging market with the fifth largest territory in the world (Abreu et al., 2022). Among the BRICS countries, Brazil has the highest percentage of renewable energy (45%) in total energy consumption (Wolde-Rufael & Weldemeskel, 2020). This country has promised, under the Paris agreement, to reduce carbon emissions by 37% and 43% in 2030 and 2035, respectively, relative to 2005 carbon emissions (Udemba & Tosun, 2022). Within this scenario, Brazilian firms adopt ESG policies to gain legitimacy with stakeholders (Ronconi, 2012), and ESG practices are gaining importance in improving the activities of Brazilian firms (Arrive & Feng, 2018). Moreover, the presence of institutional voids, significant private benefits of control for large shareholders, and weak investor protection characterize Brazil (Caixe, 2022; Parente et al., 2013).

Law 6404/76 encouraged family firms to go public because it allowed the issuance of dual-class shares without the dominant owners losing control of the company (Caixe, 2022). Many Brazilian firms use a dual-class structure, with insiders holding common voting shares and outsiders holding preferred shares, which despite not giving voting rights, have the same economic rights as common shares (Black et al., 2010). In this line, Brazil has undergone significant changes in recent decades, including specific actions to change corporate



governance. The changes include revitalizing the stock markets with the rise of the Novo Mercado. These changes have made Brazil more viable and attractive for companies to raise equity capital (Black et al., 2014). Accordingly, since December 2000, Brazilian listed companies on the Brazilian stock exchange (B3) can voluntarily migrate to three listing segments: Level 1, Level 2, and Novo Mercado. They require strict corporate governance practices, such as increased minority shareholder rights, improved disclosure, and greater board independence (Caixe, 2022). In Brazil, institutional investors such as hedge funds and pension funds usually appoint minority shareholders (Silveira, 2022).

Brazil has the *jeitinho* culture, i.e. the intermediary path, which is a unique and relevant differential that Brazilian companies have to face (Arrive & Feng, 2018), with family firms representing more than 90% of Brazilian companies and 60% of the country's Gross Domestic Product (Balán et al., 2022). In addition, Brazil has difficulty accessing sources of financing (Manoel & Moraes, 2022).

2.2 Agency theory

An agency relationship refers to a contract in which one or more individuals hire another to perform a service on their behalf (Jensen & Meckling, 1976). In this relationship, one party (agent) performs work delegated by another (principal) (Eisenhardt, 1989). Agency theory emerged from two axioms: individuals have idiosyncratic goals, and information is imperfect for principals and agents (Wiseman et al., 2012). According to this theory, individuals are individualistic, selfish, and opportunistic (C. Chen et al., 2021), leading to incentive problems and moral hazards (Holmström, 1979). Accordingly, agency theory posits that the principal is concerned with the opportunistic behavior of managers, and external mechanisms are needed to monitor the behavior of managers (Panda & Leepsa, 2017). One possible mechanism that can align the interests of owners and managers is analyst coverage. Analysts can reduce informational asymmetry by mitigating agency conflicts (Jiraporn et al., 2012).

2.3 Stakeholder theory

Stakeholders refer to "any group or individual that can affect or is affected by an organization" (Freeman, 1984). The term stakeholder first appeared in 1963 in an internal memorandum from the Stanford Research Institute (Parmar et al., 2010). According to stakeholder theory, firms act to meet the needs of their stakeholders (Freeman, 1999). Accordingly, the main duty of managers is to create value for stakeholders (Hörisch et al., 2020). Wicaksono and Setiawan (2022) suggest that companies need to create a good relationship with stakeholders. It is worth to mention that successful stakeholder management leads to better ESG performance (Velte, 2017). Since a wide range of information must be provided to stakeholders, analyst coverage plays a crucial role in the dialogue with stakeholders (García-Sánchez et al., 2019).

2.4 Analyst coverage and ESG performance

Analyst coverage exhibits the number of analysts following a company and regularly publishing forecasts and recommendations, i.e., it represents financial analysts' decisions to follow companies (Hinze & Sump, 2019). Analysts act as external monitors (Hussain et al., 2021) that collect, process, and disseminate information from the companies they follow (Qian et al., 2019). Analysts can express their concerns on conference calls, corporate websites, and research reports to target clients (Y. Zhang, 2022), and analyst recommendations help determine the value of a firm's stock (Shi et al., 2017). In addition, analyst coverage can promote ethical behavior (Hussain et al., 2021).



According to agency theory, managers may take actions to reduce their employment risk, even if shareholders do not agree with these actions (Gentry & Shen, 2013). Agency theory argues that analyst coverage is an external governance mechanism (Shi et al., 2017), that reduces informational asymmetry between managers and shareholders (Aguilera et al., 2015). Chen et al. (2015) suggest that a decrease in analyst coverage results in higher agency problems because it reduces monitoring. In this line, analyst coverage may prohibit excessive benefit consumption by managers (C. Chen et al., 2022). Thus, analyst coverage can act as an external monitoring mechanism to help reduce agency problems (Gentry & Shen, 2013).

Analyst coverage increases firms' exposure to environmental and social issues to stakeholders. Consequently, less CSR engagement may cause stakeholder dissatisfaction; thus, firms with analyst coverage increase their CSR engagement (Hu et al., 2021). Accordingly, firms with higher analyst coverage generally receive more attention from society and are more likely to be evaluated positively by stakeholders when engaging in CSR (Chun & Shin, 2018). However, Qian et al. (2019) argue that more intensive analyst coverage restricts investment in socially responsible activities because managers feel more pressured to meet short-term performance goals. Since sustainable investments are long-term, these investments would not help meet short-term performance goals.

Jo and Harjoto (2014) concluded that analyst coverage does not significantly influence the CSR strength of companies, but analysts do provide indirect pressure for companies to reduce their irresponsible activities. Using a sample of 4757 firm-year observations of Chinese firms from 2010 to 2019, Zhang (2022) concluded that analyst coverage reduces CSR decoupling. Lei et al. (2022) suggest that sell-side analysts promote CSR activities in Chinese companies. Using 10,860 firm-year observations for 2010–2017 in China, Hu et al. (2021) found that analyst coverage significantly enhances CSR engagement. Lu and Abeysekera (2021) indicated that the number of analysts following a firm is positively associated with strategic CSR disclosures.

Using a sample of 7,739 firm-year observations of U.S. firms from 2006 to 2015, Hussain et al. (2021) documented that analyst coverage positively influences CSR performance. Chun and Shin (2018) found that analyst coverage is positively associated with corporate social performance (CSP) in 3146 firm-year observations of Korean firms from 2002 to 2015. Based upon a large sample of 12,527 firm-year observations, Harjoto and Jo (2011) reveal a positive relationship between analyst coverage and CSR engagement.

Using a sample of companies belonging to the STATS database of MSCI ESG Research, Adhikari (2016) found that firms with greater analyst coverage have lower CSR scores. From a sample of US companies from 2001 to 2013, Qian et al. (2019) suggest that analyst coverage undermines socially responsible performance. In line with theoretical discussions and prior empirical findings, the following hypothesis is proposed:

Hypothesis 1: Analyst coverage is positively associated with environmental, social and governance performance

Hypothesis 2: Analyst coverage is positively associated with environmental pillar performance

Hypothesis 3: Analyst coverage is positively associated with social pillar performance

Hypothesis 4: Analyst coverage is positively associated with governance pillar performance

3 Methodology

Since this paper aims to analyze the influence of analyst coverage on ESG performance, we extracted information on ESG performance, analyst coverage and control variables from the

Refinitiv database. Panel-Corrected Standard Error (PCSE) estimation method was employed to analyze this relationship.

3.1 Sample selection

The sample consists of 105 listed firms on the B3 (Brazil Stock Exchange and Over-the-Counter Market) collected from 2015 to 2020. The sample is unbalanced because full data is unavailable for all firms and years, and it consists of a total of 481 firm-year observations. We exclude financial firms. The reason for the exclusion is that these firms are subject to different types of market regulations (Ren et al., 2022). Consequently, financial firms different regulatory measures (Konadu et al., 2022). Our data set comprises information from the Refinitiv database. Refinitiv database covers over 80% of the global market value across more than 630 ESG metrics (Refinitiv, 2022a). The ESG score from Refinitiv accounts for the most relevant industry metrics, with transparency biases and minimum firm size (Refinitiv, 2022a). These metrics are collected from annual and sustainability reports, company websites, and global media sources (Refinitiv, 2022a). Details of the sample selection procedures are reported in Table 1.

Table 1

Sample selection methodology

Filtering process	Observations
Brazilian firms' observations in the period 2015 – 2020	3523
Less observations from financial firms	73
Less observations with missing values of ESG data	2275
Less observations with missing values of other financial data	694
Final sample	481

This study excluded all firms with missing annual data for ESG data and financial data. In the first stage, the study excluded all financial firms, which excluded 73 firm-year observations. The study also excluded all firms with missing ESG data, which led to the elimination of 2275 firm-year observations. Finally, this study excluded all firms with missing financial data, which excluded 694 firm-year observations. Thus, the final sample contains 481 firm-year observations from 105 firms from 2015-2020. Table 2 illustrates the sector classification based on the Global Industry Classification Standard (GICS) (Panel A) and year (Panel B).

Table 2
Sample distribution by sector of activity and year

Panel A Distribution by sector					
Sector	N	%	Sector	N	%
Communication Services	13	2.70	Information Technology	14	2.91
Consumer Discretionary	101	21.00	Materials	66	13.72
Consumer Staples	59	12.27	Real State	20	4.16
Energy	26	5.41	Utilities	90	18.71
Health Care	32	6.65			
Industrials	60	12.47	Total	481	100
Panel B Distribution by year					
Year	N	%	Year	N	%
2015	66	13.72	2019	99	20.58
2016	66	13.72	2020	101	21.00
2017	72	14.97			
2018	77	16.01	Total	481	100

Table 2, Panel A, shows the distribution of the sample based on the Global Industry Classification Sector (GICS) of the Refinitiv database. GICS is a classification standard used worldwide by thousands of market participants, such as consultants, asset managers, and brokers (Refinitiv, 2022b). In this line, market participants have widely used the GICS methodology for asset allocation research, portfolio management, and investments (Refinitiv, 2022b). This table shows that the consumer discretionary sector is the most represented with 21.00%, followed by the utilities sector with 18.71%. The least represented sector is the communication services sector with only a percentage of 2.70%. Table 2, Panel B, reports the distribution of the sample by year. It is worth noting that the number of observations gradually increases each year.

3.2 Dependent variable

The divergence of ESG ratings represents a challenge for empirical research, investors, and policymakers because it can alter the results and conclusions of a study, the evaluation of investments, and affect social and environmental policies (Apergis et al., 2022). We measure a firm's environmental, social, and governance commitment using ESG performance scores from Refinitiv. ESG scores from Refinitiv transparently and objectively measure a company's ESG effectiveness, performance, and commitment from data reported by the company (Refinitiv, 2022a). The scores consider the relative performance of ESG factors with the company's sector (for environmental and social) and country of incorporation (for governance) (Refinitiv, 2022a). ESG scores allow investors to compare a firm's performance on various ESG dimensions (Rajesh et al., 2022). Thus, the indicators from Refinitiv offer homogeneity and coverage (Baraibar-Diez et al., 2019). Refinitiv ESG scores are suitable for this study because it has high informational power (Pacelli et al., 2022). This study considered four ESG variables: the overall ESG score and separate environmental, social, and governance scores. It is worth noting that the ESG score, environmental score, social score and governance score has a scale of 100.

3.3 Independent variable and control variables

Analyst coverage refers to the number of analysts following a particular firm (Yang et al., 2022). Analysts examine publicly available data, such as financial statements and other announcements, and release them to the public (Chun & Shin, 2018). Analyst coverage, as an independent variable, is calculated as the natural logarithm of the number of analysts

monitoring the firm during a calendar year (Dzieliński et al., 2018; García-Sánchez et al., 2019; Yu et al., 2020). See the variables description in Table 3.

Table 3
Variables description

Variable name	Variable name	Model name	Proxy
Dependent	ESG score	ESG	Refinitiv ESG Score is an overall company score based on the self-reported information in the environmental, social and corporate governance pillars.
Dependent	Environmental score	ENV	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value.
Dependent	Social score	SOC	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.
Dependent	Governance score	GOV	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value.
Independent	Analyst coverage	ANCOV	Natural logarithm of the number of analysts monitoring the firm during a calendar year
Control	Board size	BSIZE	The total number of board members at the end of the fiscal year
Control	CEO duality	CEODUAL	Dummy variable that equals one if the CEO and chairman are the same person and zero otherwise
Control	Profitability	ROA	Income after taxes for the fiscal period/Total assets
Control	Leverage	GROWHT	Market capitalization of common stock plus book value liabilities/book value of total assets
Control	Leverage	LEV	Total debt/Total assets
Control	Firm size	FSIZE	Natural logarithm of total assets

Control variables regarding ESG performance were introduced to the regression model to decrease the likelihood of bias in the results. We include control variables at the board and firm-level that can affect the ESG performance. At the board level, we included board size and CEO duality. Board size is the total number of board members at the end of the fiscal year. Larger boards bring different points of view into the decision-making (Campanella et al., 2021; Husted & Sousa-Filho, 2019). Additionally, larger boards have a better monitoring function and better represent stakeholders (Lin & Nguyen, 2022). Accordingly, boards with this characteristic are more effective in CSR engagement. Thus, we expect a positive relationship between board size and ESG performance. CEO duality is a dummy variable that equals one if the CEO and chairman are the same person and zero otherwise. CEO duality limits the board's monitoring (Tibiletti et al., 2021); consequently, the firm's decisions are not always geared toward stakeholder wealth (Romano et al., 2020). Furthermore, the CEO and board chair



separation considers stakeholders' interests, encouraging companies to engage more in social and environmental practices (Govindan et al., 2021). Thus, we expect a negative relationship between CEO duality and ESG performance.

At the firm level, we included profitability, growth opportunities, leverage, and firm size. Profitability is the ratio between income after taxes for the fiscal period and total assets. More profitable firms are more likely to have resources available to meet stakeholder needs (Marchini et al., 2022). These companies also have more slack resources, meaning they have fewer constraints on exploring new businesses, such as CSR (Djalilov & Hartwell, 2022). Thus, we expect a positive relationship between profitability and ESG performance. Growth opportunities is the ratio of the market capitalization of common stock plus book value liabilities to the book value of total assets. Growth opportunities create demand for the firm, encouraging investment in CSR activities (Bansal, 2022). Thus, we expect a positive relationship between growth opportunities and ESG performance. Leverage is measured as debt over total assets. More leveraged firms may be more sustainable for justifying the legitimacy of their operations to creditors (S. Chen et al., 2021). Thus, we expect a positive relationship between leverage and ESG performance. Firm size is the natural logarithm of total assets. Larger firms allocate resources more efficiently and are encouraged to invest in ESG aspects to mitigate reputational risk (Barros et al., 2022). In addition, larger companies are more likely to be under higher societal pressure to be sustainable (Jouber, 2021). Thus, we expect a positive relationship between firm size and ESG performance.

3.4 Empirical models

This study investigates the impact of analyst coverage on ESG performance. Statistical tests were performed to check for the issue of multicollinearity, first-order autocorrelation between the error terms, and heteroscedasticity. The highest VIF of the study was 1.43, suggesting that the study does not suffer from a multicollinearity problem, which occurs when the VIF is higher than 10 (Hair et al., 2005). For autocorrelation, Wooldridge test rejected the null hypothesis, suggesting the presence of first-order autocorrelation among the error terms ($p < 0.01$). Additionally, the Breusch-Pagan Lagrange multiplier test ($p < 0.01$) suggested the heteroskedasticity problem. Thus, we employ the Panel-Corrected Standard Error (PCSE) estimation method. This method is consistent in the presence of first-order serial correlation and heteroscedasticity (Neves & Marques, 2022).

Beck and Katz (1995) argue that when T is higher than N, generalized least squares approaches cannot be used because standard error estimates are problematic. Additionally, generalized least squares underestimates standard errors in finite samples (Reed & Ye, 2011). Thus, the PCSE method has better efficiency than generalized least squares when the number of periods is equal to or higher than the number of cross-sections (Hossain, 2016). We employed the following equation using the PCSE method to investigate the link between analyst coverage and ESG performance:

$$ESG_{i,t} = \beta_0 + \beta_1 ANCOV_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 CEODUAL_{i,t} + \beta_4 ROA_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LEV_{i,t} + \beta_7 FSIZE + \varepsilon_{i,t} \quad (1)$$

$$ENV_{i,t} = \beta_0 + \beta_1 ANCOV_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 CEODUAL_{i,t} + \beta_4 ROA_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LEV_{i,t} + \beta_7 FSIZE + \varepsilon_{i,t} \quad (2)$$

$$SOC_{i,t} = \beta_0 + \beta_1 ANCOV_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 CEODUAL_{i,t} + \beta_4 ROA_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LEV_{i,t} + \beta_7 FSIZE + \varepsilon_{i,t} \quad (3)$$

$$GOV_{i,t} = \beta_0 + \beta_1 ANCOV_{i,t} + \beta_2 BSIZE_{i,t} + \beta_3 CEODUAL_{i,t} + \beta_4 ROA_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 LEV_{i,t} + \beta_7 FSIZE + \varepsilon_{i,t} \quad (4)$$

where, ESG is the ESG score. ENV is the environmental score. SOC is the social score. GOV is the governance score. BSIZE is the board size. ANCOV is the analyst coverage. CEODUAL is the is the duality between CEO and chairman. ROA is the profitability. GROWTH is the growth opportunities. LEV is the leverage. FSIZE is the firm size. All continuous variables are winsorized at the 1st and 99th percentiles. Furthermore, β_0 is the intercept and $\beta_1 \dots \beta_n$ are the regression coefficients and ε_{it} is the remainder error term.

4 Results

4.1 Descriptive statics

Table 4 reports the descriptive statistics for ESG performance, analyst coverage, and control variables. The mean ESG performance is 0.475, with a standard deviation of 0.217, and values range from 0 to 0.899.

Table 4

Descriptive statics

Variables	Mean	SD	Minimum	Maximum
ESG	0.475	0.217	0.013	0.899
ENV	0.430	0.278	0	0.942
SOC	0.498	0.244	0.005	0.969
GOV	0.492	0.224	0.008	0.912
ANCOV	2.027	0.636	0	2.833
BSIZE	8.860	3.001	1	23
CEODUAL	0.278	0.448	0	1
ROA	0.064	0.133	-1.788	0.643
GROWHT	1.371	1.016	0.164	8.075
LEV	0.354	0.222	0	1.928
FSIZE	22.091	1.309	17.019	26.248

Regarding environmental performance, the mean is 0.430, with a standard deviation of 0.278. Social performance has a mean of 0.498 and a standard deviation of 0.244. Finally, governance performance has a mean of 0.492 with a standard deviation of 0.224. The average analyst coverage 0.636, lower than 8,440 and 8,683, reported by Dzieliński et al. (2018) and García-Sánchez et al. (2019). The standard deviation is 0.636 and the values range from 0 to 2.833.

4.2 Correlation analysis

Table 5 presents the Pearson correlation matrix. The results indicate that ESG performance, environmental performance, social performance and governance performance have a positive linearity with analyst coverage. Additionally, ESG performance has positive linearity with board size, profitability and firm size. On the other hand, ESG performanec has negative linearity with CEO duality.

Table 5
Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
ESG	1.0										
ENV	0.8*	1.0									
SOC	0.9*	0.7*	1.0								
GOV	0.7*	0.4*	0.5*	1.0							
ANCOV	0.2*	0.1*	0.1*	0.1*	1.0						
BSIZE	0.4*	0.4*	0.4*	0.2*	0.1	1.0					
CEODUAL	-0.1*	-0.10	-0.1	-0.0*	0.1*	-0.1*	1.0				
ROA	0.1*	0.18	0.1*	0.1*	0.2*	0.1*	-0.1	1.0			
GROWHT	-0.1	-0.1	-0.1	-0.1*	0.1*	-0.1*	0.1*	0.2*	1.0		
LEV	0.1	0.1	-0.1	0.1	0.1	0.1	0.1*	-0.1*	-0.1*	1.0	
FSIZE	0.5*	0.5*	0.5*	0.2*	0.1*	0.2*	-0.1*	0.1*	-0.2*	-0.1	1.0

4.3 Multivariate analysis

Table 6 presents the results of the estimation models using the PCSE method. The results reveal a positive and significant relationship of analyst coverage and ESG performance. The results also indicate that analyst coverage positively influences environmental performance and social performance. Furthermore, the evidence suggests that analyst coverage positively impacts governance performance. These findings support agency theory. Analysts can act as information intermediaries to monitor managers' CSR behavior (Y. Zhang, 2022). Moreover, they can act as monitors to contain bad news concealed by managers (Yang et al., 2022). Thus, analyst coverage reduces informational asymmetry between managers and shareholders (Aguilera et al., 2015).

Table 6
Regression of analyst coverage on the ESG performance

Dependent variable: ESG Performance				
Panel-Corrected Standard Error				
	ESG	ENV score	SOC score	GOV score
ANCOV	0.036*** (0.011)	0.031** (0.014)	0.033** (0.013)	0.045*** (0.015)
BSIZE	0.015*** (0.003)	0.018*** (0.004)	0.018*** (0.003)	0.006 (0.004)
CEODUAL	-0.024 (0.021)	0.034 (0.02)	-0.001 (0.024)	-0.038 (0.023)
ROA	0.208** (0.083)	0.246** (0.117)	0.124 (0.095)	0.335*** (0.090)
GROWHT	0.016* (0.008)	0.035*** (0.011)	0.015 (0.010)	-0.011 (0.010)
LEV	0.110** (0.045)	0.123** (0.585)	0.090* (0.052)	0.141** (0.055)
FSIZE	0.065*** (0.007)	0.099*** (0.102)	0.072*** (0.008)	0.019** (0.009)
Constant	-1.254*** (0.153)	-2.083*** (0.212)	-1.385*** (0.182)	-0.131 (0.204)
Observations	481	481	481	481
Firms	105	105	105	105
R-squared	0.3142	0.3353	0.2845	0.1037
Wald chi2	294.26***	274.96***	230.44***	70.14
Period	6	6	6	6

Note: This table presents the result of estimating baseline equation using the Panel-Corrected Standard Error estimation technique. ESG is the ESG score. ENV is the environmental score. SOC is the social score. GOV is the governance score.



BSIZE is the board size. ANCOV is the analyst coverage. CEODUAL is the is the duality between CEO and chairman. ROA is the profitability. GROWTH is the growth opportunities. LEV is the leverage. FSIZE is the firm size. All continuous variables are winsorized at the 1st and 99th percentiles. Standard errors are shown in parentheses under coefficients. ***, **, * indicate statistical significance at 1%, 5%, and 10% level, respectively.

The results also support the stakeholder theory. Stakeholder pressure through analyst monitoring can lead the company to increase ESG performance (Jo & Harjoto, 2014). Analyst coverage can encourage firms to undertake ESG activities to obtain favorable opinions from their stakeholders (García-Sánchez et al., 2019). As analysts disclose information to the firm's external stakeholders and attract market attention to the companies, monitored managers may be more concerned about CSR issues (Y. Zhang, 2022). Analysts can help stakeholders better understand CSR reporting (Tsang et al., 2022). Thus, analyst coverage is necessary for good corporate governance because it improves the behavior of social businesses (Hussain et al., 2021).

Negative analyst coverage may cause companies to be more careful and reduce their socially irresponsible corporate activities (Jo & Harjoto, 2014). Hussain et al. (2021) indicate that higher analyst coverage interacts with board mechanisms to promote companies' CSR performance. Chun and Shin (2018) indicate that analyst coverage increases the reputational capital of Korean firms.

The results suggest that board size positively influences ESG, environmental, and social performance. These results support agency and stakeholder theory which argues that larger boards help improve the monitoring function and represent stakeholders (Lin & Nguyen, 2022; Lui & Zainulidin, 2022). Further, larger boards bring resources to the firm through their advice and connections and protect the interests of the managers (Muhammad et al., 2022). The results indicate a positive relationship between profitability and ESG performance, environmental performance, and governance performance. These findings suggest that profitable firms engage in sustainable practices because they have incentives (Solikhah & Maulina, 2021). The results suggest a positive relationship between growth opportunities and ESG performance. Alves et al. (2012) argue that firms with higher growth opportunities need to have better environmental practices. The results reveal that firm leverage positively impacts ESG performance. More leveraged firms tend to project positive information (Talha et al., 2016) by investing more in ESG performance (Ren et al., 2020). Finally, firm size positively influences ESG performance. Large companies tend to attract more attention and are under more pressure to meet stakeholder demands (Hu et al., 2021).

5 Conclusion

In recent years, firms have been implementing sustainability strategies due to growing public awareness and corporate recognition of the importance of ESG activities (Garcia et al., 2017; Pereira da Silva, 2022). This fact reflects the concerns of their shareholders and customers (Barros et al., 2022), with investors incorporating ASG issues into two investment decisions (D. Zhang & Lucey, 2022). Since there is limited evidence on ESG performance in emerging markets, there is a need for further analysis of ESG performance and its drivers in these countries (Lozano & Martínez-Ferrero, 2022).

This study examined the impact of analyst coverage structure on ESG performance for a sample of 105 Brazilian firms from 2015 to 2020. The study uses agency and stakeholder theory, and the dependent variable of the study is the ESG score from the Refinitiv database. As the independent variable, the study used the natural logarithm of the number of analysts monitoring the firm during a calendar year. This study employed the panel-corrected standard error (PCSE) estimation technique.

Our results suggest that analyst coverage positively influences ESG performance. The results also indicate that analyst coverage positively influences environmental and social performance. Furthermore, the evidence suggests that analyst coverage positively impacts governance performance. Regarding the control variables, board size, profitability, growth opportunity, leverage and size positively influence ESG performance.

The study has theoretical implications. First, the results validate agency theory, which posits that firms with analyst coverage effectively monitor managers and reduce their opportunistic behavior. Second, the results validate stakeholder theory, arguing that analyst coverage brings higher dialogue with stakeholders. In this respect, firms with analyst coverage are likely to meet the needs of their stakeholders. Finally, the study adds new insights into previous literature on analyst coverage and ESG performance because it addresses these issues in Brazil.

The study has practical implications. First, the study helps Brazilian companies' managers by showing analyst coverage's crucial role in CSR engagement. Second, for policymakers, the results demonstrate the importance of analysts covering companies. Thus, policymakers should encourage analyst coverage through effective actions that raise awareness of companies. Finally, the study reveals to shareholders that companies with analyst coverage are more effective in environmental, social, and governance engagement.

The study has limitations. First, the study does not incorporate macro-institutional factors, such as political, cultural, and social factors. These factors can influence ESG performance. Second, the paper does not address qualitative aspects. Finally, the study focuses only on Brazilian firms. Thus, future studies could include macro-institutional factors and qualitative metrics such as word count.

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