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The Impact of ESG Performance on the Value Relevance of Agribusiness Firms in BRICS

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Abstract

Purpose: This study aims to analyze the relationship between environmental, social and governance (ESG) performance and stock prices of agribusiness companies in the BRICS.
Design/methodology/approach: The final sample comprises 196 observations from thirty-nine agribusiness companies across the five BRICS countries, covering the period from 2009 to 2022. Data was collected from the London Stock Exchange Group plc (LSEG) and analyzed using panel data methods, specifically Generalized Least Squares (GLS) and Panel-Corrected Standard Errors (PCSE).
Findings: The results indicate that the ESG variable exhibits a significant and positive relationship with stock prices across the overall analysis period (2009-2022) in both models. This suggests that investors in agribusiness companies in BRICS countries consider ESG performance information a significant factor in their investment decisions. The findings align with the Stakeholder Theory, which emphasizes the importance of building stakeholder trust to secure investments. However, they also resonate with Signaling Theory, which shows that ESG disclosure functions as a credible signal of corporate quality that reduces information asymmetry, and with Legitimacy Theory, which suggests that ESG adoption helps firms meet societal and institutional expectations.
Contributions: This study contributes to the academic debate by expanding the literature on the impact of ESG in agribusiness, particularly in the context of emerging economies within BRICS, and by integrating different theoretical lenses to explain how the market prices ESG performance. Practically, it guides investors in making informed decisions, mitigating risks, and pursuing long-term returns. It also highlights the social relevance of ESG performance in shaping investors' perceptions, as improved ESG performance can attract more investment and incentivize agribusiness companies to adopt more responsible strategies, thereby fostering sustainable development.

Keywords: Environmental, Social, and Corporate Governance; ESG; Value Relevance; Agribusiness; BRICS.

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Introduction

In recent years, Environmental, Social, and Governance (ESG) issues have shifted from a peripheral concern to a central element in corporate valuation and investor decision-making. For instance, in 2020, BlackRock - one of the world's largest asset managers - announced that sustainability would become a core criterion in its investment strategy, affecting more than USD 10 trillion in managed assets (Fink, 2022). Consistent with this repositioning, empirical evidence further shows that firms with higher ESG scores experienced lower stock price volatility during the COVID-19 crisis (Broadstock et al., 2021).

In the agribusiness sector, companies such as JBS and Marfrig have faced sharp market penalties following environmental and social controversies, reflecting heightened investor sensitivity to ESG-related risks (Matthews, 2021). By contrast, firms that strengthened their ESG governance structures - such as Marfrig in a later stage and COFCO International - obtained valuation premiums and improved access to international capital (Matthews, 2021).

These findings reflect a broader transformation in how sustainability is embedded within economic logic and market pricing mechanisms. In this context, sustainability refers to actions aimed at fostering environmental and social conditions that ensure human security, well-being, and health, achieved through changes in production and consumption patterns (Tan & Lu, 2016). Within financial markets, this concept is operationalized through ESG performance, which has assumed a central role in both academic research and corporate practice by translating social and environmental expectations into observable and decision-relevant metrics for investors and other stakeholders (Durand et al., 2019; Raimo et al., 2020).

In this regard, investors increasingly demand that companies demonstrate responsible ESG performance, as such performance is perceived as a risk-reducing factor that enhances long-term financial performance (Dalal & Thaker, 2019; Duan et al., 2023; Garcia et al., 2017; Gupta & Chaudhary, 2023; Zumente & Bistrova, 2021). Aligned with this perspective, 89% of CEOs from more than 100 countries report that committing to ESG practices positively influences their companies' financial success (International Business Report [IBR], 2021). Additionally, managers recognize that, in the long run, corporate performance and value can be strengthened through engagement in social responsibility initiatives and the effective communication of these actions to stakeholders (Ali & Kaur, 2021).

The literature has analyzed the value relevance of ESG performance in different contexts. Fazzini and Dal Maso (2016) examined how voluntary information disclosure affects the market value of Italian companies. Miralles-Quirós et al. (2018) examined the relationship between ESG information and stock prices in the Brazilian market. Miralles-Quirós et al. (2019) analyzed the relationship between ESG and stock prices in the banking sector across 20 countries. Setyahuni and Handayani (2020) examined the value relevance of ESG scores based on evidence from studies in Indonesia. Răpan et al. (2022) researched the relevance of ESG performance in European Union stock exchanges. Sahlian et al. (2023) examined the value relevance of ESG scores before, during, and after two periods of economic turmoil: the 2008 financial crisis and the COVID-19 pandemic. E-Vahdati et al. (2023) analyzed the impact of ESG performance on stock prices, including an assessment of their three key pillars. Santos and Tavares (2023) explored the relationship between ESG and stock prices in Latin American companies, comparing the pre- and post-pandemic periods.

Researchers have analyzed companies across sectors, but no studies have specifically examined the agribusiness industry. This gap highlights an important research opportunity, as investigating the value relevance of ESG performance in agribusiness - especially in emerging economies - may yield novel insights into how markets assess sustainability in this strategic industry. Despite growing interest in investigating the impact of ESG performance on stock prices across different geographical contexts and economic sectors, a theoretical gap remains concerning how these dynamics unfold in the agribusiness sector within BRICS countries. Furthermore, the literature does not sufficiently explain whether sectoral differences influence the value relevance of ESG, nor does it clarify how regional specificities within emerging economies, such as the BRICS, shape this relationship. This lack of sectoral and regional evidence limits our understanding of whether ESG practices are reflected equally in stock prices across different institutional and market contexts.

Therefore, the research question guiding this study is: What is the relationship between ESG and stock prices in agribusiness companies in the BRICS? To address this issue, the study's general objective is to analyze the relationship between ESG performance and stock prices of agribusiness companies in the BRICS. The sample analyzed in this study comprises 196 observations from 39 agribusiness companies across the five BRICS countries from 2009 to 2022. The ESG performance data of agribusiness companies cover the period from 2009 to 2022, with 2022 being the last year available at the time of data collection. The data were winsorized and processed using Generalized Least Squares (GLS) and Panel-Corrected

Standard Errors (PCSE) to correct for heteroskedasticity.

The research differentiates itself from previous studies in two key aspects: (i) the analysis of BRICS countries and (ii) the focus on the agribusiness sector. Together, these countries represent 31.5% of global GDP (Nadir et al., 2023) and exhibit diverse economic, political, and social contexts (Baumann et al., 2015), thereby enabling a broad understanding of how ESG factors can be adapted. The BRICS bloc faces unique challenges related to sustainable development, including rapid urbanization and environmental impacts (Garcia et al., 2017). ESG is crucial for investors seeking safe and responsible opportunities in these volatile markets, where information is less transparent.

Agribusiness plays a crucial role, particularly in ensuring the global food supply. Food production has become urgent due to population growth, rapid urbanization, and rising living standards in various nations (Quintam & Assunção, 2023). Aligning ESG performance in agribusiness represents a methodological approach to progress and growth while considering community interests, addressing an urgent need in a globalized world facing environmental challenges (Kölling et al., 2022).

The agribusiness analysis within BRICS is relevant due to its significant economic impact. China, India, and Brazil are among the five countries with the highest agribusiness GDP. India and China have a high share of agribusiness in their GDP and employment rates (Sesso Filho et al., 2022). In 2023, agribusiness accounted for 23.8% of Brazil's GDP (Centro de Estudos Avançados em Economia Aplicada [CEPEA], 2024). Pirtea et al. (2021) highlight that ESG aspects and human capital enhance the image, efficiency, and market opportunities of agricultural companies, positively impacting their stock performance. With growing sustainability awareness, investors are increasingly seeking ESG-oriented practices (Hübel & Scholz, 2020; Pedersen et al., 2021), which is attracting more investment to agribusiness companies. Additionally, ESG practices help mitigate environmental risks, reducing price volatility and uncertainty within the sector.

The study can potentially make an empirical contribution to investors by supporting informed decision-making, mitigating risks, and enhancing long-term returns. By showing that companies reduce risks through ESG practices, this research underscores how sustainability initiatives contribute to better investment decisions and improved financial performance.

Furthermore, the research can assist corporate managers in improving governance, accessing capital, and enhancing reputation and brand image. The integration of ESG practices enables companies to optimize operational efficiency, reduce costs, increase competitiveness while also securing cheaper capital. Additionally, ESG adoption enhances corporate reputation and fosters stronger brand loyalty among customers and business partners. Consequently, managers may benefit from higher compensation when part of their remuneration is tied to stock prices.

In addition, this study addresses a gap in the literature, as prior research has not explored the value relevance of ESG within the agribusiness sector. Doing so contributes to the existing knowledge on ESG and its application in agribusiness, particularly in emerging economies such as BRICS. Moreover, this research paves the way for new investigations into the impacts of ESG across different economic and social contexts, encouraging further studies in this area.

2 Theoretical Framework

2.1 Agribusiness and sustainable practices

The term "agribusiness" first appeared in Davis and Goldberg's book A Concept of Agribusiness. Unlike the agricultural sector, which is limited to the rural production cycle, Zylbersztajn (2000) notes that agribusiness encompasses the entire production chain. According to Contini et al. (2006), this chain covers everything from manufacturing inputs and production in agricultural establishments to processing and final consumption.

The agribusiness sector faces significant sustainability challenges. Wilmington (2021) emphasizes that these challenges involve the sector's ability to anticipate, adapt to, and respond to critical issues. These issues include how businesses address climate change, promote workplace safety and better conditions for employees and partners, manage natural resource scarcity, and demonstrate a commitment to ethical values and transparency.

To monitor these aspects, it is essential to quantify and assess the sector performance using indicators, which have become increasingly numerous in recent years due to the growing awareness of natural resource scarcity (Borlachenco & Gonçalves, 2017). In this context, incorporating ESG practices in agribusiness can enhance companies' competitiveness by improving operational efficiency, mitigating environmental and social risks, and attracting conscientious investors and consumers (Viana et al., 2018).

Regarding the countries that comprise the BRICS, notable differences exist in how they manage and benefit from the agribusiness sector. For example, China and Brazil exhibit the highest deforestation rates, contributing to more than half of the carbon emissions from this practice (Ávila, 2016). In Brazil, agribusiness was excluded from the bill that joined the carbon market, recently

approved by the Senate's Environment Committee (Rechmann, 2023). In India, climate change is driving global agricultural adjustments, and the country remains particularly vulnerable due to government-imposed price controls. The increasing incidence of extreme weather events raises concerns about global food security, particularly given India's significant role as a major food exporter (Portal do Agronegócio, 2024).

In summary, sustainability in agribusiness is not only about environmental preservation but also a strategic factor that can directly influence companies' risk profiles, operational costs, and access to new markets. These elements are increasingly observed by investors when assessing corporate value, thereby creating a direct connection to the discussion of value relevance.

2.2 ESG performance and value relevance

Financial information can generate benefits for investors by connecting market performance with accounting measures, demonstrating the company's value (Feltham & Ohlson, 1995). Studies on value relevance aim to determine whether investors utilize accounting information to assess companies' assets. This concept is empirically operationalized, as accounting figures will only exhibit a significant association with stock prices if they convey information useful to investors in the assessment of firms (Barth et al., 2001). Accordingly, value relevance refers to the usefulness of accounting information for investment decision-making (Huian et al., 2018).This perspective is particularly relevant for agribusiness companies, as ESG performance can serve as a signal of long-term sustainability, reducing uncertainty for investors and strengthening their trust in financial reporting. Chauhan and Kumar (2018) show that companies that publish non-financial information, such as ESG reports, experience a value impact, resulting in lower financial costs.

In emerging markets such as Brazil, ESG performance has become an essential element by simultaneously contributing to environmental sustainability, social responsibility, and profitability, while strengthening the competitiveness of Organizations (Campos Filho & Oliveira, 2023). As agribusiness firms operate in environmentally sensitive contexts, the adoption of socially responsible practices may strengthen stakeholder engagement and influence market perceptions (Barnett & Salomon, 2012).

Prior studies have investigated the relationship between ESG practices and stock prices (E-Vahdati et al., 2023; Fazzini & Dal Maso, 2016; Miralles-Quirós et al., 2018, 2019; Răpan et al., 2022; Sahlian et al., 2023; Santos & Tavares, 2023; Setyahuni & Handayani, 2020). The relationship has generally been positive, which can be explained by Stakeholder Theory. According to this theory, companies should focus on earning the trust of stakeholders to ensure investments (Freeman, 2010).

From a sectoral perspective, this relationship is expected to be particularly relevant in agribusiness. Agribusiness firms operate under high environmental exposure, climate dependency, regulatory scrutiny, and reputational risk, especially regarding deforestation, carbon emissions, water use, labor conditions, and food safety (Busch & Ferretti-Gallon, 2017). These characteristics intensify investors' sensitivity to ESG performance in this sector, since failures in environmental or social conduct may rapidly translate into supply chain disruptions, export restrictions, legal sanctions, and loss of market access, particularly in international markets (Hartmann, 2011). Moreover, climate-related risks directly affect productivity, asset values, and cash flow stability in agribusiness firms, strengthening the role of ESG as a mechanism for risk mitigation and value protection (Kahn et al., 2021).

Beyond this perspective, the Signaling Theory (Connelly et al., 2011; Spence, 1973) suggests that ESG performance may serve as a credible signal of corporate quality, thereby reducing information asymmetry and investor risk perceptions. Likewise, the Institutional Theory (DiMaggio & Powell, 1983; Scott, 2015) highlights that companies adopt ESG performance not only to satisfy stakeholders but also in response to institutional pressures, which vary across sectors and regions. Thus, companies that commit to developing responsible performance and disclosing more information to the public will be more valued by market participants, as reflected in increased stock prices (Miralles-Quirós et al., 2019).

Institutional Theory (DiMaggio & Powell, 1983; Scott, 2015) further reinforces this mechanism, as agribusiness companies in BRICS countries face increasing institutional pressures from international buyers, financial institutions, environmental agencies, and global regulatory standards related to sustainable supply chains (Gereffi et al., 2005). Compliance with ESG practices thus becomes not only a legitimacy tool but also a prerequisite for maintaining access to export markets and long-term financing, especially in emerging economies characterized by regulatory uncertainty and market volatility (Bouten, 2017; Khan et al., 2016).

Fazzini and Dal Maso (2016) investigated the impact of voluntary disclosure of sustainable performance information on the market value of Italian companies from 2008 to 2013. They found that the voluntary disclosure of environmental information is positively associated with a company's market value. Miralles-Quirós et al. (2018) sought to determine whether corporate social

responsibility activities undertaken by companies listed on the São Paulo Stock Exchange between 2010 and 2015 had a significant impact on their value. The results revealed that investors value the ESG performance of companies listed on the Brazilian Stock Exchange.

Miralles-Quirós et al. (2019) analyzed the relationship between ESG and stock prices in banking sector companies. They found that better ESG performance is associated with higher stock prices. Setyahuni and Handayani (2020) examined the relevance of ESG performance in the Indonesian market. Empirical tests have shown that investors view ESG positively, leading to increased stock prices. Răpan et al. (2022) researched the relevance of ESG performance in the European Stock Market from 2017 to 2021. The conclusion is that ESG scores have a positive and significant effect on stock prices, reflecting investor behavior and their views on sustainable investments.

Sahlian et al. (2023) examined the value relevance of ESG scores before, during, and after periods of economic turmoil (including the 2008 financial crisis and the COVID-19 pandemic), considering a company's financial performance. It was found that in pre-turmoil phases, non-financial information, including ESG scores, is relevant to the value of decisions and is considered to positively influence company performance.

E-Vahdati et al. (2023) analyzed how ESG performance influences stock prices, including analyzing each of its three pillars. They also considered the moderating role of the Corporate Social Responsibility (CSR) premium and the presence of a former CEO as president in the relationship between ESG and value in companies in Japan and Malaysia. The results showed that such performance can contribute to achieving higher stock prices. Santos and Tavares (2023) examined the value relevance of ESG performance by comparing the period before and after the onset of the pandemic. They found that ESG had a negative relationship with stock prices before the pandemic, but after the pandemic started, the relationship became positive.

Barbosa et al. (2024) investigate how corruption conditions the link between ESG performance and the value relevance of accounting information in firms operating across G20 economies. Their findings indicate that both the aggregate ESG score and its separate environmental, social, and governance dimensions are positively reflected in firms' market valuation. Nevertheless, when the institutional environment is taken into account, the level of corruption does not appear to significantly alter this relationship. However, the literature also presents contrasting evidence. Cordazzo et al. (2020), for example, found a negative relationship between ESG performance and firm value, suggesting that investors may interpret certain sustainability performance as costs that outweigh potential benefits. Similarly, Wong and Zhang (2022) documented cases in which higher ESG scores were associated with lower stock prices, indicating that the market's perception of ESG is not always favorable and may vary across contexts, sectors, and periods.

Taken together, these findings highlight that while much of the empirical evidence suggests a positive association between ESG performance and stock prices, some studies show negative or context-dependent effects. This ambivalence underscores the need for further research to clarify the conditions under which ESG contributes positively or negatively to firm value.

Additionally, agribusiness firms are highly capital-intensive and dependent on long production cycles, which increases exposure to price volatility and operational risk (Dutta et al., 2024). In this context, ESG performance contributes to a lower cost of capital, reduced cash flow uncertainty, and improved risk–return profiles, making sustainability information particularly value relevant for investors when pricing agribusiness stocks (Albuquerque, 2021; El Ghoul et al., 2011; Hmaittane et al., 2019).

Empirical evidence supports this reasoning. Chauhan and Kumar (2018) show that firms disclosing non-financial information experience lower financial costs and higher profitability. Scrimgeour et al. (2024) analyzed how reputational disasters related to ESG factors are associated with the financial performance of major agri-food companies. The results reveal that large firms initially demonstrate resilience, with no immediate negative returns, whereas smaller firms experience a substantial, significant, and persistent depreciation in their stock market value.

Taken together, although the literature presents mixed evidence regarding the ESG-value relationship in general (Cordazzo et al., 2020; Wong & Zhang, 2022), the structural characteristics of the agribusiness sector suggest that ESG performance should be particularly value relevant. The sector's strong exposure to environmental risk, institutional pressure, global supply chains, and sustainability scrutiny reinforces the expectation that superior ESG performance will be positively reflected in stock prices.

The study's hypothesis is grounded in three theoretical perspectives. Stakeholder Theory emphasizes the importance of corporate commitment to stakeholder interests, suggesting that socially responsible practices can enhance firm value. Institutional Theory highlights how companies respond to external pressures and norms by adopting practices such as ESG disclosure to gain legitimacy. Signaling Theory posits that voluntary disclosure of ESG practices serves as a signal of transparency and long-

term strategic orientation, potentially attracting investors.

H1: ESG performance is positively associated with the stock prices of agribusiness companies from BRICS countries.

3 Methodological Aspects

3.1 Sample and data collection

We obtained the data from the London Stock Exchange Group plc (LSEG). The initial sample included 3,276 observations from 234 agribusiness companies across the five BRICS countries, covering the period from 2009 to 2022. We collected the data in US dollars (USD) to facilitate comparisons across the countries under analysis. The final sample comprised 196 observations from thirty-nine agribusiness companies.

The agribusiness companies were selected based on their North American Industry Classification System (NAICS) codes, with companies included if they fell within any of the 18 agribusiness sectors. For this purpose, all companies classified under code 11 – Agriculture, Forestry, Fishing, and Hunting were considered. Accordingly, firms belonging to the segments of crop production, animal production, forestry and logging, fishing, hunting, trapping, and support activities for agriculture and forestry were included. Within this agribusiness segment, companies were represented across four sectors: basic materials (54), non-cyclical consumption (119), energy (7), and healthcare (16). The final sample is described in Table 1.

Table 1. Variables used in the models

Country	Initial Sample	Countries with companies without ESG performance	Missing Data	Final Sample
Brazil	336	-	294	42
China	1,526	-	1,444	82
India	1,148	-	1,125	23
Russia	126	126	-	0
South Africa	140	-	91	49
Total	3,276	126	2,954	196

Source: Prepared by the authors

From the initial sample, 126 observations from Russia were excluded because companies in this country did not provide ESG-related information. Next, 2,954 observations of companies with missing data in one or more variables were excluded.

3.2 Data treatment

We processed the data using descriptive statistics, correlation analysis, mean-comparison tests, and panel-data regression models. To compare whether the variable values differ significantly between companies above and below the ESG median, we applied the Mann-Whitney test. We chose the Mann-Whitney test due to the lack of normality in the data, as confirmed by the Shapiro-Francia test.

For the application of unbalanced short-panel regression models, we conducted the F-Chow, Breusch-Pagan Lagrangian Multiplier, and Hausman tests to determine whether the panel exhibited pooled OLS, fixed, or random effects. The results indicated the presence of fixed effects. Moreover, the Variance Inflation Factor (VIF) test indicated no multicollinearity, as all VIF values were below 5.0 (Akinwande et al., 2015).

The Wooldridge and White tests identified autocorrelation and heteroscedasticity problems, respectively. We used Generalized Least Squares (GLS) and Panel-Corrected Standard Errors (PCSE) to address these issues, enabling the correction of the previously detected errors(Wooldridge, 2013).

We applied winsorization at the 1% level in each tail for treating outliers. Additionally, we applied the Box-Cox transformation to the dependent variable (stock price) to improve normality, using a λ (lambda) value that maximizes the likelihood estimator and minimizes the sum of squared residuals (Chung et al., 2007). We then used the Bacon test to identify multivariate outliers, but no such issues were detected. After these adjustments, the regression model residuals exhibited a normal distribution according to the Shapiro-Francia test at the 5% level in all models, except for the environmental component model, which had a p-value of 0.05357.

3.3 Measuring value relevance

The concept of value relevance was proposed by Ohlson (1995) and subsequently tested by Collins et al. (1997). This model considers the Book Value per Share (BVPS) and Earnings per Share (EPS) as variables that affect the company's market value. Furthermore, the model was adapted to include the primary variable of interest – ESG – and control variables such as leverage (Lev) and company size (Lntam). Controls of the country, sector, and year were also included. The dependent variable (stock price) is the value at the end of March and April, and the average is used to reduce arbitrariness in selecting the period, consistent with studies by Miralles-Quirós et al. (2018, 2019).

$$Price_{i,t+1} = a_{i,t} + \beta_1 EPS_{i,t} + \beta_2 BVPS_{i,t} + \beta_3 ESG_{i,t} + \beta_4 Lev_{i,t} + \beta_5 Lntam_{i,t} + country + sector + year + \varepsilon_{i,t}$$

Where: Price: stock price of company i in period t+1 (April,

March, and the average of the two months of the following year); EPS: Earnings per share of company i in period t; BVPS: Book value per share of company i in period t; ; ESG: ESG score of company i in period t; Lev: leverage of company i in period t;; Lntam: natural logarithm of the total assets of company i in period t, used as a proxy for firm size.

Table 2 describes the expected relationships between the explanatory and control variables and the dependent variable (stock price).

Table 2. Relationship between EPS, BVPS, ESG, Leverage (END), and Company Size (Lntam) and Stock Price

Variables	Expected Relationship	Definition	Theoretical Source
EPS	+	Information provided by earnings is valuable, and when reported earnings differ from market expectations, the market reacts accordingly. Thus, a higher EPS indicates greater profitability, attracting investors.	Marques et al. (2022); Ohlson (1995)
BVPS	+	A higher BVPS suggests the company has more liquid assets per share, indicating greater financial strength and lower risk, which can attract investors.	Marques et al. (2022); Ohlson (1995)
ESG	+	ESG can signal higher long-term value creation and greater transparency, potentially boosting stock prices.	Miralles-Quirós et al. (2018, 2019)
Lev	-	More indebted companies may have higher agency costs and greater bankruptcy risks. Higher debt levels can also increase the company's vulnerability to economic fluctuations or financial crises, increasing the risk of business discontinuity.	Marques et al. (2022); Ohlson (1995)
LNTAM	+	Larger companies typically suggest greater operational capacity and value generation for investors. Thus, they are perceived as more stable and attractive in the market.	Bhat et al. (2006); Brown et al. (1999)

Source: Prepared by the authors
Legend: EPS = Earnings per share; BVPS = Book value per share; ESG = Environmental, Social, and Governance score; Lev = Total leverage; Lntam = Logarithm of company size.

3.4 ESG variable

The ESG variable used in this study is based on scores disclosed by the LSEG platform. This open and flexible platform aims to drive business innovation by connecting users with the largest global directory of verified financial professionals (LSEG, 2024). The ESG scores from this platform, designed to support sound and sustainable investment decisions, cover data representing 80% of global market value across 76 countries and include more than 450 metrics (LSEG, 2024).

The total ESG score is calculated as a weighted sum of its categories. The weights for the environmental and social categories may vary by sector, while the weights for governance remain constant across all sectors. These weights are normalized as percentages, ranging from 0 to 100, with higher scores indicating better ESG performance(LSEG, 2024).

4 Results

4.1 Descriptive statistics and Mann-Whitney test

The descriptive statistics and Mann-Whitney test results (Table 3) present the averages of companies across the variables, with companies below or above the ESG median.

Table 3. Descriptive Statistics and Mann-Whitney Test

Variables	Below Median		Above Median		Teste z	Prob>z
	Mean	CV	Mean	CV		
ESG	27.4143	37.9215	56.1731	16.4429	-12.0940	0.0000
ENV	20.6262	81.8025	56.8701	24.2437	-10.6140	0.0000
SOC	21.2424	56.6718	54.5651	28.1065	-11.2000	0.0000
GOV	45.9663	40.9010	59.5211	31.0080	-4.6970	0.0000
Pricea	4.7156	80.4965	5.0480	76.9779	-0.1350	0.8928
Pricem	4.6364	78.9241	5.0483	76.0782	-0.2530	0..8002
Pricex	4..676	79.5642	5.0482	76.3288	-0.1950	0.8453
ESG	0.2318	140.406	0.3517	142.0921	-1.7890	0.0736
BVPS	1.9407	97.6195	2.6440	81.4255	-3.2080	0.0013
Lntam	21.4789	3.7451	21.8540	5.6174	-2.360	0.0183
Lev	1.3089	169.596	2.3536	254.5815	-3.4190	0.0006

Source: Prepared by the authors
Legend: ESG = Environmental, Social, and Governance score; ENV = Environmental; SOC = Social; GOV = Governance; Pricea = stock price in April; Pricem = stock price in May; Pricex = average stock price for March/April; EPS = Earnings per Share; BVPS = Book Value per Share; Lntam = Logarithm of company size; Lev = Total leverage.

Table 3 shows that the average stock price of companies below the ESG median in April is 4.71, while for companies above the median, it is 5.04. In March, the stock price was 4.63 for companies below the median, while for companies above the median, it remained at 5.04. The average price difference between April and March is 4.64 for companies below the median and 5.04 for companies above the median. However, despite the nominal difference, there is no statistically significant relationship. This first analysis suggests that companies with better ESG performance do not have significantly higher stock prices.

The results show that EPS, BVPS, company size, and leverage are higher for companies above the median. This suggests that companies with more robust ESG practices are more profitable, larger, and more easily obtainable.

4.2 Correlation analysis

Table 4 demonstrates that the variables related to stock prices exhibit a positive and significant correlation with ESG and its components, except for the environmental component, which is not significant. These results suggest that companies with more ESG performance have higher stock prices, as argued by E-Vahdati et al. (2023), Fazzini and Dal Maso (2016), Miralles-Quirós et al. (2018, 2019), Răpan et al. (2022), Sahlian et al. (2023), Santos and Tavares (2023), and Setyahuni and Handayani (2020).

Table 4. Correlation Analysis

	ESG	ENV	SOC	GOV	Pricea	Pricem	Pricex	EPS	BVPS	Lntam	Lev
ESG	1.00										
ENV	0.87***	1.00									
SOC	0.93***	0.79***	1.00								
GOV	0.45***	0.11	0.27***	1.00							
Pricea	0.12~	-0.03	0.18**	0.23**	1.00						
Pricem	0.12~	-0.03	0.18*	0.24***	0.9916***	1.00					
Pricex	0.12~	-0.03	0.18*	0.23**	0.99***	0.99***	1.00				
EPS	0.21**	0.05	0.29***	0.20**	0.7122***	0.70***	0.71***	1.00			
BVPS	0.33***	0.161*	0.42***	0.22**	0.71***	0.71***	0.71***	0.73***	1.00		
Lntam	0.20**	0.38***	0.11	-0.11	-0.17*	-0.16*	-0.16*	-0.26***	-0.15*	1.00	
Lev	0.27***	0.34***	0.26***	-0.09	-0.15*	-0.15*	-0.15*	-0.05	0.02	0.48***	1.00

Source: Prepared by the authors. ~ p < 0.1, ** p < 0.05, ** p < 0.01, *** p < 0.001. Legend: ESG = Environmental, Social, and Governance score; ENV = Environmental; SOC = Social; GOV = Governance; Pricea = stock price in April; Pricem = stock price in May; Pricex = average stock price for March/April; EPS = Earnings per Share; BVPS = Book Value per Share; Lntam = Logarithm of company size; Lev = Total leverage.

We also found that EPS and BVPS exhibit a positive and significant relationship with stock prices. These results align with the Ohlson (1995) model and have been reported in other studies (Collins et al., 1997; Marques et al., 2022; Santos & Tavares, 2023). On the other hand, asset size and leverage were negatively associated with stock prices. The negative effect of asset size was unexpected, as larger companies are typically perceived as more attractive and therefore tend to have higher stock prices. Conversely, the negative relationship with leverage supports the notion that more highly leveraged companies face greater pressure to maintain attractiveness, which can result in lower stock prices.

4.3 Multivariate analysis

The data in Table 5 indicate that, according to R^2, 75% of the variation in stock prices can be explained by the variables EPS, BVPS, ESG, asset size, and indebtedness. The EPS has a positive and significant relationship with the stock price. This variable can influence investors' decision-making, as the disclosure of positive results tends to drive increases in stock prices. In this regard, it is worth noting that EPS is an essential variable for users to assess investment decisions (Marques et al., 2022; Ohlson, 1995). This reinforces the idea that financial performance remains a central driver in explaining stock market behavior, even when non-financial factors such as ESG are also considered. The confirmation of EPS relevance indicates that investors in BRICS markets still rely heavily on traditional accounting metrics to guide their investment strategies.

Regarding the BVPS variable, a positive and significant relationship was observed, suggesting that a higher book value is associated with higher stock prices. This result aligns with studies by Marques et al. (2022) and Miralles-Quirós et al. (2019), demonstrating that stronger equity positions positively affect. Such evidence indicates that

Table 5. Econometric Models

Variables	GLS	PCSE	GLS	PCSE	GLS	PCSE
	Pricea	Pricea	Pricem	Pricem	Pricex	Pricex
Intercept	0.8504	2.3438	-0.3924	1.0900	0.3607	1.7196
	(1.3419)	(1.6764)	(1.3892)	(1.7273)	(1.3094)	(1.6915)
EPS	1.1048***	0.2794*	1.0724***	0.2759*	1.0876***	0.2740*
	(0.1819)	(0.1359)	(0.1775)	(0.1407)	(0.1785)	(0.1372)
BVPS	0.4035***	0.3872***	0.4070***	0.3798***	0.4049***	0.3828***
	(0.0409)	(0.0407)	(0.0401)	(0.0413)	(0.0403)	(0.0407)
ESG	0.0128***	0.0157***	0.0112***	0.0150**	0.0121***	0.0153***
	(0.0026)	(0.0043)	(0.0024)	(0.0046)	(0.0024)	(0.0044)
Lev	0.0128	0.0135	0.0137	0.0132	0.0140	0.0132
	(0.0103)	(0.0075)	(0.0091)	(0.0080)	(0.0096)	(0.0077)
Lntam	-0.1036	-0.1340	-0.0429	-0.0831	-0.0793	-0.1081
	(0.0550)	(0.0743)	(0.0562)	(0.0769)	(0.0528)	(0.0752)
Country control	Yes	Yes	Yes	Yes	Yes	Yes
Sector control	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196	196	196	196	196	196
Groups	39	39	39	39	39	39
r2		0.7566		0.7555		0.7572
Chi2	707.1845***	381.3844***	765.6506***	354.7601***	754.1529***	372.2369***

Source: Elaborated by the authors. Standard errors in parentheses. ~ $p < 0.1$, ** $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Legend: GLS = Generalized Least Squares; PCSE = Panel-Corrected Standard Errors; ESG = Environmental, Social, and Governance score; env = environmental; soc = social; gov = governance; pricea = stock price in April; pricem = stock price in May; pricex = average stock price of March/April; EPS = earnings per share; BVPS = book value per share; Lntam = logarithm of asset size; Lev = total indebtedness.

investors may perceive companies with stronger balance sheet structures as more robust and reliable, especially in emerging economies where financial stability is a key concern. Therefore, BVPS not only reflects firm value but also signals long-term solvency and credibility to the market.

The ESG variable showed a positive and significant relationship with stock prices. This suggests that a better ESG performance disclosure may indicate a positive image of the companies, contributing to an increase in stock prices. This result supports Hypothesis 1, which posits that ESG performance positively impact stock prices. Accordingly, the findings align with Stakeholder Theory, which emphasizes that more extensive ESG disclosure fosters long-term value creation; with Signaling Theory, which shows that ESG disclosure serves as a credible signal of corporate quality that reduces information asymmetry; and with Legitimacy Theory, which indicates that firms strengthen their legitimacy by meeting societal and institutional expectations through ESG adoption. The results of this research support the studies of E-Vahdati et al. (2023), Fazzini and Dal Maso (2016), Miralles-Quirós et al. (2018, 2019), Răpan et al. (2022), Sahlian et al. (2023), Santos and Tavares (2023), and Setyahuni and Handayani (2020), which suggest that ESG performance enhance stock prices.

However, this finding must be interpreted with caution, since the literature also presents contrasting evidence (Cordazzo et al., 2020; Wong & Zhang, 2022), indicating that in some contexts ESG may represent additional costs that reduce firm value. The fact that the effect is positive in BRICS countries suggests that investors in emerging economies may place greater importance to ESG performance as a differentiating factor, rewarding firms that can signal transparency and responsibility in less mature institutional environments.

Yeh et al. (2020) note that investments in sustainable companies generate long-term value for shareholders, as these companies prioritize identifying and mitigating economic, social, and environmental risks. Consumers are increasingly seeking out ethical and transparent companies, which can lead to a perception of greater security, thereby increasing investor valuation of ESG companies. Additionally, effective management of environmental and social issues can lead to cost savings and innovation, while strong governance promotes transparency and trust. Therefore, these factors can result in more stable and resilient financial performance, increasing stock prices over time. Our findings are consistent with this argument, since ESG performance in BRICS firms appears to act as a mechanism for risk reduction and long-term strategic positioning, which markets incorporate into stock valuations.

It is essential to emphasize that an organization's adoption and commitment to ESG performance fosters the development of more reliable relationships with stakeholders. This stimulates greater collaboration, reciprocity, and an improved corporate reputation, driving the organization's innovation capacity. This approach creates competitive advantages that strengthen the company's resilience and facilitate quicker recovery (Carmeli et al., 2020; Gallego-Álvarez et al., 2011). Therefore, the evidence presented here contributes to the debate on how ESG creates value: not only by improving legitimacy and reputation but also by directly influencing investors'

perceptions and capital market pricing mechanisms.

4.4 Additional analysis

This study employed four additional robustness analyses: (i) an ESG component analysis; (ii) the inclusion of an ESG dummy variable; (iii) estimation using the GMM model; and (iv) an analysis of the interaction between ESG and the pandemic. Table 6 summarizes the relationship between each ESG component and stock price.

Table 6. Summary of the ESG Score Analysis

Variables	GLS	PCSE	GLS	PCSE	GLS	PCSE
	Pricea	Pricea	Pricem	Pricem	Pricex	Pricex
Panel A – Environmental Pillar						
Intercept	0.5343	2.6725	-0.3067	1.5013	0.2626	2.1375
	(1.4245)	(1.8419)	(1.3539)	(1.8832)	(1.3665)	(1.8560)
EPS	1.0944***	0.2784*	1.0596***	0.2705	1.0770***	0.2706*
	(0.1720)	(0.1351)	(0.1680)	(0.1404)	(0.1687)	(0.1365)
BVPS	0.4145***	0.3960***	0.4164***	0.3875***	0.4163***	0.3914***
	(0.0379)	(0.0416)	(0.0363)	(0.0424)	(0.0368)	(0.0417)
ESG	0.0074***	0.0090**	0.0070***	0.0086**	0.0072***	0.0088**
	(0.0021)	(0.0032)	(0.0019)	(0.0033)	(0.0020)	(0.0032)
Lev	0.0111	0.0119	0.0134	0.0120	0.0127	0.0118
	(0.0095)	(0.0076)	(0.0084)	(0.0080)	(0.0089)	(0.0077)
Lntam	-0.0875	-0.1373	-0.0457	-0.0910	-0.0735	-0.1159
	(0.0601)	(0.0824)	(0.0551)	(0.0844)	(0.0566)	(0.0831)
Country control	Yes	Yes	Yes	Yes	Yes	Yes
Sector control	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196	196	196	196	196	196
Groups	39	39	39	39	39	39
r2		0.7460		0.7426		0.7457
Chi2	780.0965***	345.8116***	1.1e+03***	329.3545***	913.2487***	340.2206***
Panel B – Social Pillar						
Intercept	1.2504	2.2223	0.2832	1.0286	0.8912	1.6326
	(1.4088)	(1.6359)	(1.4165)	(1.6783)	(1.3760)	(1.6444)
EPS	1.0275***	0.2247	0.9816***	0.2298	1.0079***	0.2243
	(0.1799)	(0.1369)	(0.1759)	(0.1423)	(0.1769)	(0.1385)
BVPS	0.4129***	0.3969***	0.4159***	0.3920***	0.4135***	0.3936***
	(0.0403)	(0.0406)	(0.0399)	(0.0414)	(0.0399)	(0.0407)
ESG	0.0135***	0.0153***	0.0123***	0.0145***	0.0130***	0.0148***
	(0.0026)	(0.0037)	(0.0026)	(0.0039)	(0.0026)	(0.0038)
Lev	0.0126	0.0121	0.0138	0.0123	0.0137	0.0120
	(0.0103)	(0.0075)	(0.0093)	(0.0079)	(0.0097)	(0.0076)
Lntam	-0.1211*	-0.1248	-0.0726	-0.0773	-0.1025	-0.1008
	(0.0581)	(0.0716)	(0.0573)	(0.0736)	(0.0559)	(0.0720)
Country control	Yes	Yes	Yes	Yes	Yes	Yes
Sector control	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196	196	196	196	196	196
Groups	39	39	39	39	39	39
r2		0.7646		0.7650		0.7665
Chi2	714.7177***	393.5415***	664.9012***	370.4715***	702.2102***	385.2979***
Panel C – Governance Pillar						
Intercept	-1.4868	-0.0751	-2.2963	-1.2944	-1.8040	-0.6808
	(1.2746)	(1.5349)	(1.2935)	(1.6090)	(1.2599)	(1.5651)
EPS	1.2025***	0.2979*	1.1792***	0.2965*	1.1817***	0.2936*
	(0.1728)	(0.1367)	(0.1716)	(0.1412)	(0.1703)	(0.1378)
BVPS	0.3720***	0.3686***	0.3638***	0.3645***	0.3700***	0.3662***
	(0.0344)	(0.0412)	(0.0339)	(0.0417)	(0.0337)	(0.0412)
ESG	0.0026	0.0017	0.0027	0.0025	0.0029	0.0020
	(0.0019)	(0.0028)	(0.0021)	(0.0030)	(0.0020)	(0.0029)
Lev	0.0101	0.0123	0.0105	0.0128	0.0114	0.0124
	(0.0109)	(0.0078)	(0.0094)	(0.0081)	(0.0101)	(0.0079)
Lntam	0.0172	-0.0025	0.0565	0.0427	0.0325	0.0202
	(0.0500)	(0.0635)	(0.0498)	(0.0671)	(0.0486)	(0.0651)
Country control	Yes	Yes	Yes	Yes	Yes	Yes
Sector control	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196	196	196	196	196	196
Groups	39	39	39	39	39	39
r2		0.7358		0.7351		0.7364
Chi2	1.4e+03***	331.3223***	893.0436***	315.5555***	1.4e+03***	325.7448***

Source: Elaborated by the authors. Standard errors in parentheses. ~ $p < 0.1$, ** $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Legend: GLS = Generalized Least Squares; PCSE = Panel-Corrected Standard Errors; ESG = Environmental, Social, and Governance score; env = environmental; soc = social; gov = governance; pricea = stock price in April; pricem = stock price in May; pricex = average stock price of March/April.

The results highlight a positive relationship between the social (Panel B) and environmental (Panel A) components and stock value. These findings align with theoretical predictions that greater transparency leads to higher stock value, consistent with the studies by Miralles-Quirós et al. (2018, 2019). These results strengthen the Stakeholder Theory view, suggesting that governance-oriented management tends to increase stock prices by providing greater security for investors.

At the same time, they support Signaling Theory, as ESG disclosure functions as a credible signal of corporate quality that reduces information asymmetry, and Legitimacy Theory, since firms that improve ESG performance strengthen their legitimacy by meeting societal and institutional expectations. This perception aligns with Cheng et al. (2019), who found that the corporate governance characteristics of firms increase stock prices in the Taiwanese stock market.

In particular, the evidence that the social (Panel B) and environmental (Panel A) pillars are more strongly associated with stock prices than governance (Panel C) suggests that investors in BRICS markets may be especially sensitive to firms' external impacts and sustainability commitments (Răpan et al., 2022; Santos & Tavares, 2023). This result also indicates that the benefits of ESG practices are not homogeneous across its three dimensions, reinforcing the idea that investors may value the environmental, social, and governance factors differently depending on institutional context (Sahlian et al., 2023; Setyahuni & Handayani, 2020). Therefore, these findings contribute to the debate on ESG value relevance by showing that transparency in social and environmental actions operates as a signaling mechanism that reduces information asymmetry, enhances reputation, and generates investor confidence in emerging economies (Fazzini & Dal Maso, 2016; Miralles-Quirós et al., 2018).

The second additional analysis employed a dummy variable, as detailed in Table 7. Given that only 6% of the sample companies provided ESG data, this supplementary analysis was conducted to assess whether the mere disclosure of ESG information is associated with differences in the analyzed outcomes. Accordingly, the dummy variable equals 1 for firms that provided ESG data and 0 otherwise. The sample used in this supplementary analysis comprised 1,127 firm-year observations from 148 companies.

Table 7. Econometric Model with ESG Dummy

Variables	GLS			PCSE		
	Pricea	Pricem	Pricex	Pricea	Pricem	Pricex
EPS	0.8526***	0.8330***	0.8310***	0.3150***	0.3178***	0.3093***
	(0.0795)	(0.0830)	(0.0810)	(0.0515)	(0.0509)	(0.0505)
BVPS	0.0203***	0.0200***	0.0198***	0.0259***	0.0271***	0.0265***
	(0.0041)	(0.0041)	(0.0041)	(0.0026)	(0.0028)	(0.0026)
Dummyesg	0.5158***	0.4790***	0.5040***	0.2874***	0.2750***	0.2779***
	(0.0477)	(0.0463)	(0.0467)	(0.0738)	(0.0738)	(0.0730)
Lev	-0.0167**	-0.0152*	-0.0157**	-0.0070	-0.0037	-0.0057
	(0.0057)	(0.0060)	(0.0058)	(0.0063)	(0.0063)	(0.0062)
Lntam	0.0908***	0.0886***	0.0900***	0.1855***	0.1747***	0.1806***
	(0.0135)	(0.0126)	(0.0131)	(0.0213)	(0.0217)	(0.0213)
Intercept	-1.6172***	-1.5217***	-1.5628***	-3.2151***	-3.0350***	-3.1274***
	(0.2812)	(0.2672)	(0.2765)	(0.4264)	(0.4340)	(0.4259)
Country control	Yes	Yes	Yes	Yes	Yes	Yes
Sector control	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1.127	1.127	1.127	1.127	1.127	1.127
Groups	148	148	148	148	148	148
r2				0.4137	0.3931	0.4060
Chi2	2,032.48***	1,869.03***	2,003.32***	812.03***	748.73***	786.54***

Source: Elaborated by the authors
Standard errors in parentheses
~ p < 0.1, ** p < 0.05, ** p < 0.01, *** p < 0.001
Legend: GLS = Generalized Least Squares; PCSE = Panel-Corrected Standard Errors; ESG = Environmental, Social, and Governance score; pricea = stock price in April; LPA = earnings per share; VPA = book value per share; Lntam = logarithm of asset size; Lev = total indebtedness.

EPS and BVPS showed a positive and significant relationship, corroborating the previous literature (Marques et al., 2022; Miralles-Quirós et al., 2019). Additionally, the ESG dummy shows a positive relationship with stock prices, in line with previous Studies (Miralles-Quirós et al., 2018, 2019). Therefore, the results reinforce those found in the literature, indicating that investors have considered ESG performance reduces information asymmetry and enhances investors' confidence, leading to higher firm valuation (Cheng et al., 2019; Freeman, 1984).

In addition, from the perspective of Signaling Theory, firms that provide comprehensive ESG information send a positive signal to the market about their long-term sustainability and lower risk profile, which is reflected in higher stock prices (Albuquerque, 2021; Spence, 1973). Furthermore, the findings align with Legitimacy Theory, as ESG disclosure allows firms to align themselves with social expectations, thereby reinforcing their legitimacy and attracting investor support (Suchman, 1995). Therefore, the evidence indicates that investors in BRICS countries have increasingly incorporated ESG performance practices into their asset-pricing decisions.

The third robustness analysis used GMM models to address potential endogeneity. The results show that the stock price in the previous period has a positive and statistically significant relationship with the current stock price. This finding suggests the existence of temporal persistence in stock prices, indicating that past information remains relevant for price formation in the current period, which is consistent with the inertia hypothesis in financial markets.

Table 8. GMM econometric model of the relationship between the ESG and stock prices

Variables	GMM		
	Pricea	**Pricem**	**Pricex**
Intercept	15.4061***	11.6217***	13.0073***
	(0.4923)	(0.8326)	(0.2692)
Priceat-1	0.5081***		
	(0.0084)		
Pricemt-1		0.4438***	
		(0.0079)	
Pricext-1			0.4931***
			(0.0059)
EPS	0.2198***	0.4906***	0.3545***
	(0.0274)	(0.0506)	(0.0525)
BVPS	0.5436***	0.7129***	0.6086***
	(0.0054)	(0.0092)	(0.0033)
ESG	0.0083***	0.0146***	0.0116***
	(0.0007)	(0.0010)	(0.0009)
Lev	0.0454***	0.0291***	0.0366***
	(0.0026)	(0.0020)	(0.0034)
Lntam	-0.6737***	-0.5118***	-0.5721***
	(0.0239)	(0.0408)	(0.0105)
Country control	Yes	Yes	Yes
Sector control	Yes	Yes	Yes
Year control	Yes	Yes	Yes
Observations	156	156	156
Groups	33	33	33
Chi2	4.1e+05***	1.0e+06***	1.4e+06***
Sargan test – Chi2	28.8995	28.7758	29.6639
Arellano-Bond test			
Order 1	-2.1157**	-2.1070**	-2.1034**
Order 2	-1.0051	-1.6016	-1.2662

Source: Elaborated by the authors

EPS and BVPS also exhibit positive, statistically significant relationships with stock prices. This result aligns with previously presented findings and corroborates the prior literature (Marques et al., 2022; Miralles-Quirós et al., 2019), which indicates that these variables as important determinants of firms' market value. ESG, in turn, shows a positive relationship with stock prices, indicating that the greater the firms' investment in ESG practices, the higher the valuation of their shares tends to be by investors.

The results provide evidence that investments in ESG practices signal to the market the firm's commitment to transparency and ethical conduct, indicating lower information asymmetry and greater investor confidence, as predicted by Stakeholder Theory (Cheng et al., 2019; Freeman, 1984). Furthermore, the findings are consistent with Signaling Theory, which holds that firms use sustainable practices to signal a stronger sustainability focus and a lower risk profile to the market (Albuquerque, 2021; Spence, 1973). Finally, the results also align with Legitimacy Theory, as greater disclosure of ESG practices indicates stronger alignment with social expectations, thereby reinforcing institutional legitimacy and reducing reputational risks (Suchman, 1995).

The fourth additional analysis examined whether the pandemic affected the relationship between ESG performance and stock prices. To test this effect, we interacted with ESG performance with a dummy variable coded as 1 for the pandemic years (2020 and 2021) and 0 for the remaining years, as detailed in Table 9.

Table 9. Econometric model of the relationship between the ESG–Pandemic interaction and stock prices

Variables	GLS			PCSE		
	Pricea	Pricem	Pricex	Pricea	Pricem	Pricex
_cons	0.9980	-0.2124	1.0500	2.8946~	1.7153	2.2656
	(1.3192)	(1.3229)	(1.2250)	(1.7108)	(1.6652)	(1.7181)
EPS	1.1345***	1.0557***	1.0914***	0.3402*	0.3394*	0.3367*
	(0.1786)	(0.1729)	(0.1735)	(0.1347)	(0.1386)	(0.1355)
BVPS	0.4027***	0.4088***	0.4069***	0.3944***	0.3846***	0.3890***
	(0.0405)	(0.0398)	(0.0398)	(0.0401)	(0.0406)	(0.0401)
ESG	0.0087**	0.0063~	0.0087**	0.0125**	0.0117*	0.0120*
	(0.0034)	(0.0035)	(0.0033)	(0.0048)	(0.0048)	(0.0048)
Pandemia	-0.0185	-0.1062	-0.0820	-0.7769	-0.5545	0.0000
	(0.6160)	(0.6603)	(0.6266)	(0.5798)	(0.5884)	(.)
ESG*Pandemia	0.0082~	0.0101*	0.0083~	0.0117**	0.0129**	0.0123**
	(0.0045)	(0.0046)	(0.0044)	(0.0042)	(0.0043)	(0.0042)
Lev	0.0145	0.0158~	0.0177~	0.0106	0.0101	0.0101
	(0.0103)	(0.0093)	(0.0096)	(0.0077)	(0.0080)	(0.0078)
Lntam	-0.1076*	-0.0464	-0.1090*	-0.1522*	-0.1048	-0.1260
	(0.0539)	(0.0531)	(0.0483)	(0.0764)	(0.0740)	(0.0768)
Country control	Yes	Yes	Yes	Yes	Yes	Yes
Sector control	Yes	Yes	Yes	Yes	Yes	Yes
Year control	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196	196	196	196	196	196
Groups	39	39	39	39	39	39
r2				0.7698	0.7704	0.7712
Chi2	656.4992***	615.1085***	683.1040***	404.2942***	391.2175***	399.8353***

Source: Elaborated by the authors
Standard errors in parentheses
~ $p < 0.1$, ** $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Legend: GLS = Generalized Least Squares; PCSE = Panel-Corrected Standard Errors; ESG = Environmental, Social, and Governance score; pricea = stock price in April; LPA = earnings per share; VPA = book value per share; Lntam = logarithm of asset size; Lev = total indebtedness.

The results show that both EPS and BVPS remain significant, indicating that financial factors are relevant in explaining stock prices. Regarding the ESG variable, the analysis reveals that it is also significant in explaining stock prices, corroborating prior evidence that ESG performance positively influences firm value (E-Vahdati et al., 2023; Fazzini & Dal Maso, 2016; Miralles-Quirós et al., 2018, 2019; Răpan et al., 2022; Sahlian et al., 2023; Santos & Tavares, 2023; Setyahuni & Handayani, 2020).

The pandemic variable, in turn, shows a negative but non-significant relationship with stock prices. This result diverges from previous studies that documented significant stock price declines during the pandemic (e.g., Sahlian et al., 2023; Santos & Tavares, 2023). However, the interaction term (ESG*Pandemic) shows a positive, significant relationship, suggesting that ESG performance mitigated stock price declines. This finding aligns with Sahlian et al. (2023) and Santos and Tavares (2023), who observed that companies with stronger ESG performance experienced smaller stock price losses during periods of crisis.

5 Conclusions

This research aimed to analyze the relationship between ESG performance and stock prices of agribusiness companies in BRICS. The study analyzed 196 observations from 39 agribusiness companies across the five BRICS countries from 2009 to 2022. The data was obtained from the LSEG Platform. The data were processed using a panel-data approach with GLS and PCSE.

The results conclude that EPS and BVPS are relevant for explaining stock prices in the agribusiness sector. ESG performance also positively correlated with stock prices, confirming the research hypothesis. Thus, the results align with the Stakeholder Theory, suggesting that investors have considered non-financial information (ESG) in their decisions, thereby contributing to long-term value creation. Additionally, under Institutional Theory, ESG performance can be seen as a response to external pressures for legitimacy and alignment with social expectations. From the perspective of Signaling Theory, ESG performance

may signal transparency and commitment to sustainable practices, which the market values accordingly.

The study offers empirical insights for investors on informed decision-making, risk mitigation, and long-term returns. By doing so, they can achieve more resilient, potentially more profitable portfolios, especially in a sector so relevant to these countries' economies. For managers, the study emphasizes the significance of ESG practices in enhancing stock value, which can facilitate capital acquisition at a lower cost and improve the company's reputation and image.

In practical terms, the findings imply that agribusiness companies in emerging economies should strengthen their ESG strategies not only to attract investors but also to differentiate themselves in a sector often criticized for its environmental and social impacts. This creates opportunities for firms to use ESG as a competitive advantage in global markets, improving stakeholder relations and facilitating access to international capital.

Additionally, it contributes academically by enriching the existing literature on ESG and its application in agribusiness, particularly in emerging economies such as the BRICS, and by opening new lines of investigation into the impacts of ESG across diverse economic and social contexts. For policymakers, the results reinforce the importance of fostering regulatory frameworks and incentives that encourage greater ESG disclosure in agribusiness, as such practices can enhance market transparency and credibility, which are critical for institutional strengthening in BRICS. These findings also highlight the broader implications of ESG adoption in the BRICS as representative emerging economies, where sustainable performance not only influences firm-level outcomes but may also strengthen institutional development, market credibility, and investor confidence in regions traditionally marked by regulatory asymmetries.

The study is limited by the small number of companies that disclosure ESG information. Another limitation is the potential bias stemming from the restricted sample of firms analyzed, which may not fully capture the heterogeneity of agribusiness across all BRICS countries. This reinforces the importance of studies that identify the factors that lead to low ESG disclosure by managers, particularly given the relevance of such performance to the market. Future studies could further analyze ESG performance in the agribusiness sector by segmenting its different sub-sectors, such as agricultural production, food industry, and input suppliers, to identify whether there are significant variations in the value relevance of ESG performance among them. Additionally, it would be interesting to investigate whether the cost of capital for agribusiness companies is higher than in other sectors, given that companies in this sector, on average, have low ESG disclosure.

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