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Effects of environmental, social and governance performance on value relevance of Brazilian companies

Efeitos do desempenho ambiental, social e de governança na relevância das informações contábeis de empresas brasileiras

Efectos del desempeño ambiental, social y de gobernanza en la relevancia de la información contable de las empresas brasileñas

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Abstract
This study aimed to analyze the relationship between environmental, social, and governance (ESG) performance and the relevance of accounting information of Brazilian companies. The research is descriptive, documentary, and quantitative. Its sample consists of 241 B[3] listed non-financial companies from 2015 to 2019. Its main findings show that ESG performance relates positively to the market-to-book (MTB) of the analyzed companies. Moreover, when testing the ESG pillars individually, we found that each of them also shows a positive relationship with the MTB of these companies so such information can be considered value relevant. We conclude, then, that engaging in ESG practices allows companies to demonstrate to their stakeholders their commitment to more responsible practices and, by doing so, make this information relevant to market participants, thus reflecting on their market value.
Keywords: ESG; Value Relevance; Brazilian Companies

Resumo
Este estudo teve como objetivo analisar a relação entre o desempenho ambiental, social e de governança (ESG) e a relevância das informações contábeis de empresas brasileiras. A pesquisa é descritiva, documental e quantitativa. Sua amostra é composta por 241 empresas não financeiras listadas na B[3], no período de 2015 a 2019. Seus principais achados demonstram que o desempenho ESG se relaciona positivamente com o *market-to-book* (MTB) das empresas analisadas. Além disso, ao testar os pilares ESG individualmente, constatou-se que cada um deles também apresenta relação positiva com o MTB dessas empresas, de modo que tais informações possam ser consideradas *value relevant*. Conclui-se, então, que o engajamento em práticas ESG permite que as empresas demonstrem aos seus *stakeholders* seu comprometimento com práticas mais responsáveis e, com isso, tornem essas informações relevantes aos participantes do mercado, refletindo, assim, em seu valor de mercado.
Palavras-chave: ESG; Relevância da Informação Contábil; Empresas Brasileiras

Resumen
Este estudio tuvo como objetivo analizar la relación entre el desempeño ambiental, social y de gobierno (ESG) y la relevancia de la información contable de las empresas brasileñas. La investigación es descriptiva, documental y cuantitativa. Su muestra está compuesta por 241 empresas no financieras listadas en B[3], en el período de 2015 a 2019. Sus principales hallazgos demuestran que el desempeño ESG está positivamente relacionado con el market-to-book (MTB) de las empresas analizadas. Además, al probar los pilares ESG de forma individual, se encontró que cada uno de ellos también tiene una relación positiva con

el MTB de estas empresas, por lo que dicha información puede considerarse relevante para el valor. Se concluye, entonces, que involucrarse en prácticas ESG permite a las empresas demostrar su compromiso con prácticas más responsables ante sus grupos de interés y, con ello, hacer que esta información sea relevante para los participantes del mercado, reflejándose así en su valor de mercado.
Palabras clave: ESG; Relevancia de la Información Contable; Empresas Brasileñas

1 Introduction

This study addresses the effects of environmental, social and governance (ESG) performance on the relevance of accounting information for Brazilian companies. The Signaling Theory was used as a basis, since one of its concerns is the reduction of information asymmetry between two related parties (Spence, 2002), through the dissemination of information capable of affecting the decision-making of their respective users (Connelly et al., 2011).

According to Peng and Isa (2020), ESG performance is considered to be the engagement of organizations in socially responsible practices, which are divided into three dimensions: environmental, social and governance. The authors point out that environmental practices are related to the use of resources, emissions and innovations carried out by companies. Relations with the workforce, human rights and responsibility for the product offered to its public constitute social practices (Peng & Isa, 2020). Finally, governance practices focus on issues related to management, shareholders, as well as socially responsible strategies (Peng & Isa, 2020).

In this context, it is assumed that investing in ESG practices aims to cause positive impacts on society. From the perspective of Signaling Theory, engaging in such practices is a way for companies to signal their stakeholders about their ability to fill institutional gaps, when compared to other organizations (Zhang et al., 2020). In doing so, companies demonstrate their commitment to socially responsible practices to market participants.

As for the relevance of accounting information, it is noteworthy that those companies that adopt accounting standards, as well as higher quality information disclosure practices, have, as a result, accounting numbers more associated with the price of their shares (Aksu et al., 2017). Thus, it is inferred that engagement in ESG practices is capable of influencing market decision-making, specifically by investors and analysts, becoming value-relevant information, as well as certain accounting information.

The literature on the relevance of accounting information, known as value relevance, presents several models that seek to capture, in general, the effect of disclosure of accounting information on profit and equity on the price or return of shares in the market. In this study, the relevance of information was analyzed, considering, in addition to profit and equity values, ESG performance as a determinant to explain variations in the companies' market-to-book.

Those companies that are prone to signaling their information are considered more transparent and reliable, which causes a positive view in the market (Spence, 2002). Thus, as a reflection of an increasingly critical society, the capital market finds itself in a context in which companies must assume their social responsibilities, so that their business environment meets the expectations of their stakeholders (Caulfield, 2013; Luhmann & Theuvsen, 2016; Salehi et al., 2018).

The proactive attitude of companies in adopting such practices (Ali et al., 2015) is considered as voluntary disclosure. The growing demand for information regarding socially responsible behavior reflects the concern of stakeholders with the attitude of these companies, regarding the transparency of their actions and, also, regarding the zeal of their relationships. Regulatory bodies, environmentalists, creditors and the media are seen as the main influencers of voluntary disclosure (Ali et al., 2017).

High-quality social disclosures can be a sign of the organization's transparency, in a way that increases its reputation, as well as the social profile of its managers (Patel et al., 2002; Deegan et al., 2006; Simnett et al., 2009). In this sense, recent literature highlights the increase in demand for ESG practices, as well as the construction of a more transparent relationship between companies and society. Thus, several advantages stand out for companies engaged in ESG practices, such as the transmission of a better corporate image to their customers (Fraj-Andrés et al., 2012); and the strengthening of links between the organization and its stakeholders (Du et al., 2010; Tench et al., 2014).

This study's research problem was based on the effects of ESG performance on the relevance of accounting information in the Brazilian context. Investing in social, environmental and governance actions, as a way of signaling good social responsibility practices, makes such information relevant to the market. As a result, the costs to develop ESG actions become compensatory when compared to the benefits brought about by such investments.

Thus, this study includes two elements of analysis: the ESG performance of Brazilian companies and its effects on the relevance of disclosed accounting information. The research gap is based, within the scope of Signaling Theory, on the analysis of the relevance of disclosing ESG practices by companies (signals) to market participants, such as investors and analysts (receivers). With this, we seek to answer the following research question: What is the effect of ESG performance on the relevance of accounting information? For this, the objective of the study is to analyze the relationship between ESG performance and the relevance of accounting information of Brazilian companies.

The present study is justified, at first, by addressing the engagement rate of Brazilian companies in ESG practices. The most critical view that currently exists on the part of market participants, leads to greater concern with social investments. In this way, a socially responsible posture on the part of companies can be considered as a sign of trust and transparency to their stakeholders.

As for the relevance of this information to the market, some studies observed the relevance of accounting information in relation to voluntary disclosure, when analyzing it in terms of environmental information (Hassel et al., 2005); and corporate social responsibility (Degenhart et al., 2017). However, this study uses a broader ESG measure, which considers the three pillars (social, environmental and governance), while the research by Degenhart et al. (2017) used only dummies of companies listed on the IBASE or ISE, which represents an advance in relation to the study on the relevance of ESG information in the Brazilian capital market.

Given the above, this study contributes to the literature by emphasizing that engagement in ESG practices can influence investors and analysts, thus maximizing the relevance of accounting numbers. As professional contributions, it can be highlighted that the results found allow both investors and shareholders to pay attention to socially responsible practices. In this way, shareholders, as capital holders, may demand mechanisms capable of guaranteeing that ESG practices faithfully reflect the reality in which companies find themselves, in relation to their levels of engagement.

2 Background and Research Hypotheses

Accounting information in the context of the capital market plays a fundamental role, and must be understandable, timely and portray the reality of companies in the best way. That said, such information is considered relevant when it affects stock prices (Ball & Brown, 1968), so that higher quality ones generate greater and more relevant equity results (Barth et al., 2008).

In the capital market, there is no equal distribution of information by the economic agents that comprise it, which is a circumstance capable of adding economic value to signaling. Thus, information asymmetry is considered to occur when different people know different things (Stiglitz, 2002). In practice, this is the situation in the capital market, since managers are those who have most of the information related to the organization's economic and financial situation, as well as those related to its socially responsible behavior.

Signaling Theory addresses the reduction of information asymmetry between two related parties (Spence, 2002) and also makes it possible to describe the behavior of these parties according to the information they receive, whether they are different or not (Connelly et al., 2011). In addition, this theory focuses on the voluntary communication of information related to the positive attributes of an organization to those who are interested in such information (Connelly et al., 2011).

At the organizational level, the Signaling Theory emphasizes the intention of the management of organizations to share information and, consequently, receive signals from the market, stakeholders and society (Connelly et al., 2011). Four elements make up this theory: signaler, signals, receiver and feedback (Taj, 2016). In the context presented, the signalers are the internal managers of the organizations, while the signals are formed by the flow of information that these managers disclose to market participants. Such participants are identified as receivers, those external to the company, being individuals, investors and employees. Finally, feedback is characterized by interactions between signalers and receivers (Connelly et al., 2011; Mavlanova et al., 2012).

In this way, managers are the agents responsible for signaling information to their stakeholders. Such signals can affect the company's value due to the reduction of information asymmetry (Levy & Lazarovich-Porat, 1995). Thus, in a context in which managers and investors have access to different information, the manager, as a signaler, must choose whether/and how to signal his information to his potential recipients. In contrast, receivers must choose how to interpret the received signal (Connelly et al., 2011).

Regarding signaling, it is highlighted that high-quality companies are the most motivated to signal their information (Connelly et al., 2011). Among the characteristics of these organizations is the high level of socially responsible investment (Daugaard, 2020). Connelly et al. (2011) consider quality as the ability of a signal to satisfy the demands of a possible receiver. Thus, such characteristics are considered as signs capable of influencing the perception of those interested in the company as to its quality.

Signals classified as high quality have the costs of producing the signal outweighed by the benefits of the signaling emitted (Connelly et al., 2011). That said, it is inferred that the engagement of companies in ESG performance can be considered as a signal sent to market participants, regarding their commitment to socially responsible practices, so that it is reflected in the relevance of their accounting information.

Therefore, research regarding the relevance of accounting information seeks to empirically investigate the usefulness of accounting information from the perspective of stock investors. They are also related to market efficiency, since the verification of this relevance in decision-making implies the verification that investors use them as an evaluation measure (Beisland, 2009).

The literature argues that socially responsible investments are capable of producing superior financial returns to the organizations' stakeholders (Moskowitz, 1972). The communication of these practices is valued by the interested parties as they are considered significant and have relevant value (Throop et al., 1993).

In response to the concerns of investors and other stakeholders, many companies have voluntarily increased their environmental disclosure as a way to address the shortage of alternative sources of communication. There is evidence that the costs of this information, as well as the financial condition of organizations, are determining factors for the disclosure of such practices to occur (Cormier & Magnan, 1999).

High-quality social disclosures are considered a sign of the organization's transparency, so that they increase its reputation, as well as the social profile of its managers (Patel et al., 2002; Deegan et al., 2006; Simnett et al., 2009). The communication of these practices has assumed a fundamental role in the context of the capital market, since it is identified as a critical factor for increasing the awareness of market participants regarding the practices carried out by organizations (Bortree, 2014).

Such disclosure may be mandatory, when legally required, or voluntary and, in this case, variations in their extent and nature may occur, according to the organizations that produce them (Brooks & Oikonomou, 2018). In this sense, social disclosure is considered to be any information that a company makes public, whether included in annual or independent reports, and related to its performance, standards or activities considered as socially responsible (Brooks & Oikonomou, 2018).

Engagement in these practices is reflected in the organization's reputation and also in the trust of its stakeholders, generating rewards that affect its financial performance (Dunn & Harness, 2018). Thus, it is noteworthy that socially responsible behavior, when practiced by organizations, can improve their image by positively affecting the assessment of their stakeholders (Ali et al., 2015; Du et al., 2010; Galati et al., 2019) .

Socially responsible investments aim to have a positive impact on society and the world. So when organizations select them, they also consider non-financial reasons such as environmental, social and governance issues. Thus, over time, a significant number of companies have voluntarily declared their commitment to such issues, making ESG investment relevant (Daugaard, 2020).

Previously, the literature analyzed the organizations' ESG to understand their effects on financial performance. One of the first empirical studies, carried out by Waddock and Graves (1997), pointed out conflicting results in this relationship when analyzing the companies of the S&P 500, identifying positive, negative or neutral relationships. On the other hand, when analyzing public companies belonging to polluting sectors in the United States, Clarkson et al. (2013) found that a proactive ESG strategy, as well as signaling this strategy to market participants, generates an increase in the price of their shares.

Friede et al. (2015) carried out a literature review with over 2,000 articles referring to the relationship between ESG criteria and corporate financial performance. Their results show that the field concerning ESG investments is empirically well founded. Furthermore, approximately 90% of the reviewed studies identified a positive relationship between these variables. It is noteworthy that the positive impacts identified were stable over time. At first, such investment does not provide returns that offset the costs involved in the process, however, over the years, this return remains stable and significant.

Velte (2017) focused on ESG performance when considering its unified value, as well as the values belonging to each dimension, to assess its impact on financial performance in German companies, from 2010 to 2014. Through correlation and regression analysis, the author analyzed the possible links between the ESG indices available at Thomson Reuters and the performance of organizations, represented by Return on Assets and Tobin's Q. Thus, the author identified a positive impact of the unified ESG value on ROA, but no impact on Tobin's Q. The analyzes of individual values revealed that, when compared to the others, the governance dimension has stronger impacts on financial performance.

Salehi et al. (2018) investigated the relationship between corporate social responsibility (CSR) spending and the financial performance of organizations in an emerging market. By examining a sample of 159 companies listed on the Tehran Stock Exchange from 2010 to 2015, they found that by investing in socially responsible practices, organizations have positive impacts on their financial performance, through changes in the return on their assets.

Through an experiment carried out in an emerging context, Khemir et al. (2019) analyzed the perception of investors regarding the inclusion of ESG information in their investment decisions. They also sought to identify which of the ESG dimensions had the greatest effect on these decisions. Their findings pointed to a positive influence of ESG information on investment allocations in Tunisia. As for the individual dimensions, it was identified that governance and social were those that had the greatest influence in this context.

Peng and Isa (2020) also sought to understand whether engagement in these practices was an agency or stakeholder issue. With a sample of 461 firms belonging to the World Islamic Index and also in accordance with Shariah, from 2010 to 2017, the authors analyzed a balanced panel data set, with engagement in ESG practices measured by the Thomson Reuters ASSET4 database index. The authors found that the unified ESG index, as well as its individual dimensions, were positively related to company performance, being consistent with the Stakeholder Theory.

Some studies have also analyzed the relevance of investments in ESG practices for the market, especially in terms of value creation or market performance of companies. At the international level, Fazzini and Dal Maso (2016) investigated the relevance of voluntary environmental information disclosed by companies listed on the Italian Stock Exchange, from 2008 to 2013. Through the operationalization of the Cormier and Magnan (2007) model, the authors identified that voluntary environmental disclosure represented relevant information for the market valuation of the analyzed companies.

Cordazzo et al. (2020) investigated, also in the Italian context, whether the implementation of the European Union Directive regarding mandatory non-financial information influenced the value relevance of information related to ESG practices. The authors examined 231 Italian companies in two time windows, pre (2016) and post (2017) implementation of the directive. The authors identified that the accounting numbers of the analyzed companies were associated with the share price, while the information referring to ESG practices was not relevant.

National surveys also considered ESG practices in their studies. When finding a positive relationship between CSR and the relevance of accounting information, Degenhart et al. (2017) observed that information related to such practices was perceived by investors as relevant, so that it affected their decision-making. Miralles-Quirós et al. (2018) analyzed whether the social responsibility activities developed by companies listed on the São Paulo Stock Exchange, in the period 2010-2015, played a significant role in the valuation of the analyzed companies.

The authors distinguished socially responsible practices into three pillars: environmental, social and corporate governance; so that their relevance could be analyzed individually using the model proposed by Ohlson (1995). Their findings support the Increased Value Theory, however, they demonstrated that the financial market did not significantly value the three ESG pillars. Since, they observed that environmental practices were valued only when carried out by companies not related to environmentally sensitive sectors, for which only social and governance practices were relevant.

Pereira et al. (2020) tested the existing nuances in the relationship between CSR and financial performance, when investigating the moderating role of voluntary disclosure in this relationship in companies that are part of the ISE, in the period from 2010 to 2013. The authors found that there was a positive and significant relationship in the two directions of causality considered, however, the dissemination of sustainability reports did not seem to intensify such relationships.

Literature on ESG indicates an effect of such practices on the financial performance of organizations. However, when the relevance of these practices for the market is analyzed more specifically, the literature shows mixed results. Some studies indicate that ESG information is relevant, others indicate that some information is not relevant for certain sectors, while others demonstrate that such information is not relevant. However, when considering that much of the literature supports a positive relationship between ESG practices and organizational performance, it is plausible to assume, as pointed out by the studies by Degenhart et al. (2017) and Miralles-Quirós et al. (2018), that such information may be relevant to the national market, as it affects decisions about buying or selling shares, helping to explain variations in the price and return of securities.

Thus, it is expected that the improvement in financial performance provided, in part, by the ESG performance, will be reflected in the financial market, changing the company's market value, generating value for the shareholder, due to the improvement of its image before the stakeholders. In this case, information on the ESG performance of companies would be considered relevant to the market, due to its influence on investor and analyst decisions. In view of the above, the following research hypothesis was formulated:

H1 = The ESG performance of Brazilian companies is relevant to market participants.

If a positive and significant relationship is identified between the ESG performance and the MTB of the analyzed Brazilian companies, hypothesis H1 cannot be rejected. With this, it can be inferred that ESG performance is relevant information for market participants, as it reflects on the market performance of organizations. This indicates that this type of information is considered by investors and analysts in their decision models on buying and selling equity interests.

3 Research Method and Procedure

This research is classified as descriptive, documentary and quantitative. Its population corresponds to all companies listed on *Brasil, Bolsa e Balcão* (B[3], the Brazilian stock exchange) in the period of January 2021. Its sample is composed of those companies that contained all the data necessary for the analysis of the relevance of accounting information. Companies in the financial sector were also removed, as they have specific characteristics in terms of accounting standards.

Table 1 shows the sample design, in which Panel A shows a total of 241 companies, corresponding to 50.52% of the total population. Thus, this research has 1,205 observations corresponding to the period from 2015 to 2019. Panel B presents the companies that make up the sample arranged by sectors, according to the classification criteria adopted by the Global Industry Classification Standard (GICS). As a result, the Discretionary Consumption sector stands out as the one with the highest number of companies (25.31%), followed by the Industrial (17.84%) and Public Utility Services (17.01%) sectors.

Table 1
Population and research sample

Panel A	Companies	%
Population	477	100
No information for:		
(-) *Market-to-book*	69	14.46
(-) Financial sector	167	35.01
Total	**241**	**50,52**
Panel B - Sample by sectors classified by GICS		
	Companies	%
Real Estate	17	7.05
Basic Consumption	17	7.05
Discretionary Consumption	61	25.31
Health	11	4.56
Energy	9	3.73
Industrial	43	17.84
Materials	28	11.62
Communication Services	8	3.32
Public Utility Services	41	17.01
Information Technology	6	2.49
Total sample	**241**	**100**

Source: Research data.

Subsequently, Table 2 exposes the research construct, which contains the description of the variables used, their measurement method and the authors who previously used them. Information regarding the unified ESG score, as well as its individual pillars, and also financial information were collected from the Refinitiv Eikon® database.

Table 2
Research Construct

Dependent Variable				
MTB_{it}	*Market-to-book* - market value of equity divided by the book value of equity of company i in period t		Cormier and Magnan (2016)	
Independent and Control Variables				
Variables	**Description**	**Calculation/Formula**	**Authors**	**Expected Relationship**
PA_{it}	1 divided by the equity per share of company i in period t		Cormier and Magnan (2016)	+
ROE_{it}	Return on equity - net income divided by the total equity of company i in period t			+
Envir_Score	Evaluates a company's impact on environmental ecologies.	Score from 0 to 100: the more items companies disclose, the closer to 100 the score will be.	Peng and Isa (2020)	+
Social_Score	The score assesses a company's ability to build healthy relationships with its employees, consumers and public.			+
Gover_Score	The score estimates a company's governance acts to create long-term shareholder interest.			+
Performance ESG	It measures a company's environmental, social and governance performance and effectiveness, based on data made available by the organizations themselves.			+
Sector	Main activity of the company.	GICS *Sector Code.*	Ho et al. (2012); Soschinski et al. (2021); Lu and Wang (2021)	+/-
Year	Period of analysis 2015 to 2019.	*Dummy* de ano.	Soschinski et al. (2021)	+/-

Source: Research data.

The relevance of accounting information is defined as the ability to capture information that affects the value of the company (Francis & Shipper, 1999). Among the existing models in the literature, there is that of Cormier and Magnan (2016), used in this study, which considers the market value of shares divided by their book equity value as a dependent variable. Therefore, the market-to-book is considered as a reference in market assessment.

ESG scores are measured by the database considering the combination of ten categories for the formation of the three individual ESG pillars, as well as for the construction of the unified ESG Score, which demonstrates the ESG performance of the company in question. According to a report from the Refinitiv Eikon® base, published in February 2021, more than 450 ESG measures available at the company level are captured and calculated, through which a subset of the 186 most comparable and material measures in each sector is formed, to the overall assessment of the company so that the unified ESG Score is formulated.

Thus, the ESG Score refers to the relative sum of the weights of each of the categories, being normalized to percentages ranging from 0 to 100. Thus, companies with higher scores are considered as those most engaged in ESG practices. In this study, the unified ESG Score for each of the companies listed in B[3] was considered in the main empirical model, as well as the individual scores of each dimension in the sensitivity tests.

For data analysis, the variables were first winsorized. Then, the Shapiro-Francia normality test, which demonstrated that the residuals are not normal (Z=10.238; z<0.000). However, the normality assumption of the OLS linear regression was relaxed when considering the Central Limit Theorem, since this assumption is restricted to samples with less than 100 observations (Stevenson, 2001; Gujarati, 2006). In order to meet the proposed objective, OLS regressions were operationalized with robust standard errors and fixed effects control by sector and year. The operationalization of robust regressions is justified by means of the White test, which proved to be significant (P=150.60; p<0.000), indicating the presence of heteroscedasticity. In addition, the Variance Inflation Factor (VIF) and Durbin Watson tests were performed in order to verify the existence of multicollinearity and autocorrelation problems between the residuals, respectively, which indicated that there were no such problems in the analyzed data.

The empirical models used are represented in Equations 1 and 2.

$$MTB_{it} = \propto_1 + \beta_1 PA_{it} + \beta_2 ROE_{it} + \beta_3 ESG_{it} + \Sigma efeitos\_fixos\_setor_{it} + \Sigma efeitos\_fixos\_ano_{it} + \varepsilon_{it} \quad \text{(Eq. 1)}$$

$$MTB_{it} = \propto_1 + \beta_1 PA_{it} + \beta_2 ROE_{it} + \beta_3 ESG_{it} + \beta_4 PA * ESG_{it} + \beta_5 ROE * ESG_{it} + \Sigma efeitos\_fixos\_setor_{it} + \Sigma efeitos\_fixos\_ano_{it} + \varepsilon_{it} \quad \text{(Eq. 2)}$$

Where:
MTB_{it}: Market-to-Book, market value of equity divided by book value of equity of company i in period t;
PA_{it}:1 divided by the equity per share of company i in period t;
ROE_{it}: Return on equity, net income divided by the total equity of company i in period t;
ESG_{it}: *unified score of ESG practices collected from the database;*
$\Sigma efeitos\_fixos\_setor_{it}$: Fixed effect control by sector;
$\Sigma efeitos\_fixos\_ano_{it}$: Fixed effect control per year;
$\propto$ and β: estimated regression coefficients;
ε_{it}: regression error in period t.

In general, a positive and significant coefficient for β_3 in Equation 1 supports a positive relationship between ESG performance and the relevance of accounting information, measured by the MTB of the analyzed companies. Furthermore, it is expected to find a positive and significant coefficient in β_4 and β_5 of Equation 2, which would indicate that engagement in ESG practices causes positive effects on the companies' MTB, when interacting with their explanatory variables (PA and ROE). With this, the relevance of the ESG performance of Brazilian companies to the financial market would become evident. In addition to the main tests, sensitivity tests were performed, for which it was decided to include the scores of each ESG pillar individually in the empirical models presented.

4 Presentation and Analysis of Results

First, the descriptive analysis of the variables of the present study is presented. Then, as a way of analyzing the association between the variables, Pearson's correlation matrix was elaborated. Finally, the results of the regressions are exposed, which aim to meet the objective proposed in this research.

Table 3 contains the descriptive analysis of the variables, in Panel A all the companies belonging to the sample are found, while in Panels B and C are the companies that have and do not have ESG scores, respectively. The Market-to-Book results shown in Panel A demonstrate that, on average, the companies in the sample have a market value almost twice as high as their book equity. In turn, the return on equity, represented by ROE, indicates that companies are generating, on average, 7% profit in relation to invested capital.

As for the information regarding the unified ESG score, it was noted that the number of companies with ESG scores increased in the period considered in this research (72 in 2015 to 95 in 2019 - data not tabulated). When performing the Mann Whitney Test to verify significant differences between the groups exposed in Panels B and C, it is possible to highlight that companies engaged in ESG practices (Panel B) have, on average, a significantly higher Market-to-Book, when compared to for those companies without engagement, the same can be observed in relation to the values of PA and ROE.

Table 3
Descriptive statistics of variables

	Mean	Standard Deviation	25th percentile	Median	75th percentile
Panel A - Total Sample					
MTB	1.734	1.969	0.399	1.101	2.430
PA	0.157	0.204	0.030	0.090	0.200
ROE	0.070	0.257	-0.000	0.'086	0.184
ESG	15.559	25.495	0	0	29.219
Envir_Score	14.092	25.655	0	0	13.567
Social_Score	16.284	27.203	0	0	29.165
Gover_Score	15.965	26.186	0	0	30.326
Panel B - Companies with ESG Score					
MTB	2.511***	2.268	0.943	1.732	3.348
PA	0.186***	0.201	0.062	0.114	0.218
ROE	0.094***	0.190	0.022	0.110	0.187
ESG	43.190	24.592	19.955	46.522	63.825
Envir_Score	42.029	27.561	11.749	45.079	65.323
Social_Score	46.738	26.321	26.549	48.818	68.618
Gover_Score	43.797	24.937	24.278	46.050	64.614
COM Panel - Companies without ESG Score					
MTB	1.348***	1.718	0.257	0.849	1.804
PA	0.142***	0.202	0.011	0.070	0.188
ROE	0.050***	0.318	-0.014	0.075	0.181
ESG	-	-	-	-	-
Envir_Score	-	-	-	-	-
Social_Score	-	-	-	-	-
Gover_Score	-	-	-	-	-

MTB = Market-to-book; PA = 1 divided by equity per share; ROE = Return on Equity; ESG = Unified ESG Score; Envir_Score = Score of the environmental pillar; Social_Score = Score of the social pillar; Govern_Score = Score of the governance pillar.
Notes: Mann Whitney Test significance levels: *p<0.1; **p<0.05; ***p<0.01.
Source: Research data.

Pearson's correlation matrix is shown in Table 4, his analysis indicates, preliminarily, that the relevance of accounting information of Brazilian companies, measured by their Market-to-Book (MTB), is positively correlated at the 1% level with their shareholders' equity (PA). However, the same does not occur with the return on equity (ROE), since the correlation identified was negative and not significant.

Table 4
Pearson correlation

Variables	MTB	PA	ROE	ESG	Envir_ Score	Social_ Score	Gover_ Score
MTB	1						
PA	0.623**	1					
ROE	-0.005	-0.080**	1				
ESG	0.244**	0.079**	0.042	1			
Envir_Score	0.241**	0.089**	0.050	0.955**	1		
Social_Score	0.229**	0.071*	0.042	0.980**	0.930**	1	
Gover_Score	0.221**	0.064*	0.025	0.929**	0.809**	0.874**	1

MTB = Market-to-book; PA = 1 divided by Equity per share; ROE = Return on Equity; ESG = Unified ESG Score; Envir_Score = Score of the environmental pillar; Social_Score = Score of the social pillar; Govern_Score = Score of the governance pillar.
Notes: Significance levels: *p<0.05; **p<0.01.
Source: Research data.

It is also noteworthy that the unified and individual ESG scores present positive and significant correlations at the 1% level with the MTB of the analyzed companies. Thus, it can be inferred that socially responsible behaviors are recognized by the market, contributing to the creation of value for companies. In addition, correlations exist at the 1% level between the PA and the unified ESG and environmental scores, and even at the 5% level with the social and governance scores. However, there were no significant correlations between these scores and the ROE of the analyzed companies.

Subsequently, Table 5 shows the results of the effects of ESG performance on the relevance of accounting information for Brazilian companies, using the model by Cormier and Magnan (2016), which was previously used to measure the relevance of accounting information for Brazilian companies by Silva et al. (2018). This table is divided into two panels (A and B), in which it is possible to observe the relevance of ESG performance in Brazilian companies and, also, the effects of such performance on the relevance of this information, respectively.

Table 5
Effect of ESG performance on the relevance of accounting information

Panel A - Relevance of ESG performance in Brazilian companies

Variables	**Dependent Variable: Market-to-book**		
	Coefficient	**t statistic**	**VIF**
Constant	-0.531	-2.24	-
PA	5.816***	20.92	1.04
ROE	0.221	1.12	1.06
ESG	0.014***	8.43	1.07
Fixed Effects Sector and Year	Yes		
Significance of the model	0.000***		
R^2	50.49		
Adjusted R^2	49.83		
Durbin Watson	1.937		
N	1,205		
Join F test			
Sector	8.83***		
Year	22.89***		

Panel B - Effects of ESG performance on the relevance of accounting information

Variables	**Dependent Variable: Market-to-book**		
	Coefficient	**t statistic**	**VIF**
Constant	-0.419	-1.77	-
PA	5.395***	16.81	1.35
ROE	-0.011	-0.05	1.25
ESG	0.009***	5.41	1.62
PA*ESG	0.022***	3.48	1.88
ROE*ESG	0.011**	2.31	1.33
Fixed Effects Sector and Year	Yes		
Significance of the model	0.000***		
R^2	51.34		
Adjusted R^2	50.60		
Durbin Watson	1.932		
N	1,205		
Join F test			
Sector	8.70***		
Year	22.83***		
PA*ESG	241.95***		
ROE*ESG	3.21**		

Notes: ***significance at the 1% level; **5%; *10%. OLS regression with robust standard errors and sector and year fixed effect control. Value relevance: Cormier and Magnan's model (2016). VIF = Variance Inflator Factor; N = Number of observations; PA = 1 divided by Equity per share; ROE = Return on Equity; ESG = Unified ESG Score.

Source: Research data.

The results shown in Panel A refer to the relevance of ESG performance for the companies in the sample, which demonstrate the existence of a positive and significant relationship, at the 1% level, between the ESG score and the market value of the companies. Thus, it can be inferred that practices related to ESG performance are perceived by the Brazilian financial market. In economic terms, it can be said that increasing the ESG performance of these companies by one standard deviation can increase their market value by up to 20.58% (0.014*25.495/1.734 (Table 3)).

The analysis shown in Panel B of Table 5 refers to the effects of ESG performance on the relevance of the accounting information of the analyzed companies. It can be noted that the unified ESG score proved to be relevant, being significant at the 1% level, as well as its effects on PA and ROE, significant at the 1% and 5% level, respectively.

Based on these findings, it is possible to infer that the book equity and the return on equity of companies with investments in ESG are more relevant than those of other companies. Regarding ROE specifically, only companies with investments in ESG present this indicator as relevant. Thus, it can be inferred that stakeholders perceive the accounting information on equity and profitability of companies with investments in ESG as more relevant for making their decisions.

To analyze the relevance of each of the ESG pillars for Brazilian companies, as well as their effects on the relevance of accounting information, the sensitivity tests shown in Panels A and B of Table 6 were performed, including the scores individually.

Table 6
Sensitivity tests

Panel A - Relevance of the environmental, social and governance pillars in Brazilian companies

Variables	**Dependent Variable: Market-to-book**		
	Envir_Score	**Social_Score**	**Gover_Score**
Constant	-0.457	-0.544	-0.520
PA	5.793***	5.829***	5.864***
ROE	0.207	0.221	0.244
Score	0.014***	0.013***	0.012***
Fixed Effects Sector and Year	Yes	Yes	Yes
Significance of the model	0.000***	0.000***	0.000***
R^2	50.25	50.36	49.83
Adjusted R^2	49.58	49.69	49.15
VIF	1.08	1.06	1.06
Durbin Watson	1.956	1.931	1.934
N	1.205	1.205	1.205
	Join F test		
Sector	8.94***	9.24***	8.26***
Year	23.09***	22.92***	22.81***

Panel B - Effects of the environmental, social and governance pillars on the relevance of accounting information

Variables	**Dependent Variable: Market-to-book**		
	Envir_Score	**Social_Score**	**Gover_Score**
Constant	-0.353	-0.417	-0.467
PA	5.416***	5.436***	5.478***
ROE	0.070	-0.013	-0.044
Score	0.009***	0.008***	0.008***
PA* Envir_Score	0.020***	-	-
ROE* Envir_Score	0.007*	-	-
PA* Social_Score	-	0.020***	-
ROE* Social_Score	-	0.011**	-
PA* Gover_Score	-	-	0.019***
ROE* Gover_Score	-	-	0.013***
Fixed Effects Sector and Year	Yes	Yes	Yes
Significance of the model	0.000***	0.000***	0.000***
R^2	50.92	51.21	50.67
Adjusted R^2	50.17	50.47	49.92
VIF	1.66	1.61	1.58
Durbin Watson	1.951	1.926	1.931
N	1,205	1,205	1,205
	Join F test		
Sector	8.75***	9.11***	8.27***
Years	23.10***	22.64***	22.94***
PA* Envir_Score	228.47***	-	-
ROE* Envir_Score	1.82	-	-
PA* Social_Score	-	247.31***	-
ROE* Social_Score	-	3.74**	-
PA* Gover_Score	-	-	232.90***
ROE* Gover_Score	-	-	5.53***

Notes: ***significance at the 1% level; **5%; *10%. OLS regression with robust standard errors and sector and year fixed effect control. Value relevance: Cormier and Magnan's model (2016). VIF = Variance Inflator Factor; N = Number of observations; PA = 1 divided by Equity per share; ROE = Return on Equity; Envir_Score = Score of the environmental pillar; Social_Score = Score of the social pillar; Govern_Score = Score of the governance pillar.

The analysis carried out in Panel A of Table 6 demonstrates that the engagement in environmental, social and governance practices, individually, increase the market value of the analyzed companies, since the scores of the three pillars were significant. In economic terms, it can be inferred that, among the analyzed pillars, the environmental pillar is the one with the greatest effect on the analyzed models, since the variation of its coefficient in one standard deviation would result in an average increase of about 20.71% on MTB (0.014*25.655/1.734 (Table 3)). In the social and governance pillars, the increase in MTB would be 20.39% (0.013*27.203/1.734 (Table 3)) and 18.12% (0.012*26.186/1.734 (Table 3)), respectively.

Panel B of Table 6 exposes the analysis regarding the effects of environmental, social and governance performances on the relevance of the accounting information of the companies belonging to the sample. As in the main analysis, shown in Table 5, in this test the individual ESG scores were significant, as well as the interactions performed between each of the scores and the financial variables PA and ROE, demonstrating that ESG practices performed individually cause positive financial effects in the analyzed companies.

Based on the results found in the three models, it can be seen that, in addition to the unified ESG score, the pillars, individually, are also relevant to market participants and contribute to the creation of value in organizations. This result corroborates the studies by Velte (2017) and Peng and Isa (2020), by suggesting that each of the activities measured by the ESG dimensions adds value to organizations.

Thus, based on the results related to the effects of ESG performance on the relevance of accounting information for Brazilian companies listed on B[3], it was found that engagement in socially responsible behavior is positively related to the relevance of accounting information. Thus, the prediction made in the hypothesis of this research is confirmed, so that it cannot be rejected.

Previous studies have highlighted that stakeholders perceive potential benefits resulting from socially responsible actions in the long term (Hahn & Kühnen, 2013; Lee & Faff, 2009; El Ghoul et al., 2011; Dhaliwal et al., 2011; Ali et al., 2015; Du et al., 2010; Patel et al., 2002; Deegan et al., 2006; Simnett et al., 2009). Thus, the results found in this research, regarding the ESG performance of Brazilian companies, contribute to the literature by demonstrating the increase in the market value of organizations as one of these potential benefits. In addition, they suggest that disclosures regarding such practices, when made with high quality, are considered a sign of the organization's transparency, reflecting on its market performance.

According to the studies by Velte (2017) and Peng and Isa (2020), this work analyzed the relevance of the pillars individually, as well as their effects on the relevance of accounting information. In line with these studies, the results showed that each pillar is positively related to MTB in Brazilian organizations. The results of this research showed that the adoption of socially responsible practices, measured by their ESG score, is perceived by participants in the financial market as relevant information.

Thus, it is inferred that such organizations are aware of the potential benefits generated by these behaviors. So, by engaging in ESG practices, they hope to meet society's expectations in relation to their organizational posture and also guarantee possible benefits, such as the generation of market value.

5 Final Considerations

This research aimed to analyze the relationship between ESG performance and the relevance of accounting information for investors and analysts. For this, a descriptive, documental and quantitative research was elaborated, in a sample of 241 Brazilian companies listed in B[3], during the years 2015 to 2019, which generated a total of 1,205 observations.

Based on the analysis, it was concluded that ESG performance is positively related to MTB, contributing to the relevance of accounting information, so hypothesis H1 was not rejected. Still regarding the ESG performance, a complementary analysis was carried out to investigate the effects of the pillars individually. Thus, it was found that the scores of each of the ESG pillars are positively related to the MTB of the investigated Brazilian organizations, and can be considered as a relevant value. Therefore, it can be concluded that all ESG information, whether environmental, social or governance, is considered relevant by market participants.

Investors and analysts can, based on the findings, reflect on companies' engagement in ESG practices and how this can affect the companies' market value. Your decision models can be adjusted to reflect such market behavior. There is a discussion in the market about companies with investments in ESG and whether portfolios formed by such companies would have higher returns than others. This study sheds light on this issue by demonstrating that companies' ESG performance appears to be relevant information for market participants.

The present study has some limitations, among which we can highlight the exclusive use of the model by Cormier and Magnan (2016) to measure the relevance of accounting information. It is not possible to guarantee that other existing models in the literature would be more effective in capturing the relevance of this information in the analyzed context. Also, measuring ESG performance using the Refinitiv Eikon® database score may limit the number of research observations.

Thus, future research may choose to use other value relevance models as a means of measurement, such as Francis and Schipper's (1999) or Ohlson's (1995). Regarding ESG performance, it is suggested that the use of additional measures can help future research to complement the findings of this study and, even, involve a larger number of companies and analyzed periods, since the number of companies that disclose ESG information and are part of the Refinitiv Eikon® database is limited.

In addition, it is not possible to identify whether organizations actually carry out ESG practices, or only disclose information related to such practices. Or the opposite, if they are engaged in ESG practices but do not disclose. Finally, it is suggested to expand the investigation of the effects of ESG performance on the relevance of accounting information in different contexts, so that it is possible to identify whether there are other factors capable of affecting this relationship, such as, for example, national culture.

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