

ESG CORPORATE PRACTICES AND FINANCIAL PERFORMANCE OF BRAZILIAN COMPANIES

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ABSTRACT

The objective of this research is to investigate the relationship between ESG corporate practices and the financial performance of Brazilian companies listed on B3 that publish a Sustainability Report. The surveyed population is composed of all Brazilian publicly traded companies listed on B3, with information from 2010 to 2021. A proxy was built to measure ESG practices, based on the literature. According to tests, data regressions on unbalanced panel were analyzed to investigate the relationship between ESG corporate practices and the companies' financial performance. Financial performance, when measured by ROA, is impacted by ESG corporate performance. The environmental and governance dimensions showed a positive, significant relationship. An evolution in the disclosure of ESG activities over the analyzed period was observed. The main inferential results of this study indicate that ESG corporate practices have a positive influence on the financial performance of Brazilian companies, both from an accounting and a market metrics perspective. In particular, corporate environmental and governance practices improve financial performance, while the influence of social practices was not found. The size of the companies was also relevant, a superior financial performance being identified in larger companies. The contribution to studies that investigate the relationship between the financial performance of companies and their environmental, social, and corporate governance actions stands out by suggesting a positive relationship between the dimensions. Managers can be impacted and encouraged to guide the development of ESG practices, considering the alignment with financial interests and the increasingly latent demands for the preservation of society and the environment by investors, who also demand good governance practice standards. This study also provides an overview of an emerging market.

Keywords: ESG; Financial Performance; Brazilian Companies.

1. INTRODUCTION

The adoption of corporate practices regarded as responsible for society and the environment is part of the agenda of government and market demands. The discussion about corporate social and environmental concerns began in the 1950s, when Bowen (1953) started to question the responsibility that companies have towards society. In the literature, especially in recent years, it is possible to notice the convergence of corporate governance and corporate social responsibility themes (ANDREU-PINILLOS *et al.*, 2020).

Corporate governance has implications for the structuring of companies' CSR practices, since it now incorporates the socio-environmental perspective into its purpose, due to the accountability mechanism (Freeman, 1984). Thus, companies have sought to align CSR with the overall governance strategy, aiming to achieve sustainable and effective management. Corporate performance in ESG (Environmental, Social and Governance) issues has been commonly used to measure a company's performance in the environmental, social and corporate governance pillars. In the environmental pillar, the focus is on the environment and how corporate operations may affect it (RAMIC, 2019). In turn, the social pillar of ESG practices indicates how the company relates to society, both in its internal and external environments, observing formal attitudes of companies regarding the protection of minorities and the promotion of cultural and educational activities in communities affected by its operations, for example. Finally, the governance pillar is related to the demand for compliance with legal

standards, good practices of corporate conduct linked to transparency and the protection of shareholders' rights in order to reduce conflicts between managers and owners. (RAMIC, 2019).

Companies have been dealing with pressures from society in general to rethink their businesses in a more ethical and sustainable way, in order to contemplate the people and the environment affected by the operations in their management policies (BOGERS *et al.*, 2020). Consequently, the themes that involve ESG have been widely discussed by academia and the market, with special attention not only to corporate speeches, but to the demand for concrete activities that meet the expectations of those impacted by the companies' operations, such as employees and the community (DURAND *et al.*, 2019; RAIMO *et al.*, 2020).

The analysis of indicators is an alternative to measure corporate sustainability, which covers environmental and social aspects, as well as the financial performance (MACHADO *et al.*, 2012). However, measurement of ESG activities by observing indexes may not provide a complete picture and the index in a mere label, according to Souza *et al.* (2019). In addition to these market-instituted indexes, previous studies have developed broad indicators, encompassing both financial and non-financial information, the latter based on the companies' voluntary disclosures.

In order to communicate the actions involving these dimensions to shareholders and other stakeholders, companies have invested in the disclosure of voluntary information by means of non-financial reports, including the Sustainability Report. In this sense of a broader analysis than the observation of indexes, Clarkson *et al.* (2008) compiled an index based on the content analysis of sustainability reports. In a complementary perspective, Lee, Min and Yook (2015) have studied the theme considering specific environmental issues, such as carbon emissions and investments in environmental research and development.

Xie *et al.* (2018) investigated whether environmental, social, and governance practices can improve the financial performance of companies. The authors built an index to measure ESG performance subdivided into dimensions, so that the relationship of each pillar with Return on Assets and Tobin's Q could be identified. In turn, Li *et al.* (2020) also constructed a governance index to investigate the relationship between the level of governance structure, the corporate activities to protect the environment and society, and their influences on corporate financial constraints.

Responsible companies cannot ignore environmental issues, since environmental destruction and resource depletion make their sustainable development impossible (SONG; ZHAO; ZENG, 2017). In this sense, companies cannot shy away from the increasingly emerging social demands and must also seek to protect their shareholders (RAMIC, 2019). On the other hand, the adoption of corporate ESG practices requires the allocation of capital, and a widely spread view is that they are an overall cost without a clear benefit, since the returns are often not directly achieved through financial results (SONG, ZHAO E ZENG 2017).

According to the neoclassical economic thought, Friedman (1970) points out that the primary purpose of managers should be the maximization of shareholders' wealth. According to this interpretation, investing in ESG practices, as they do not have such clear financial benefits, would not be justifiable and would accentuate an agency conflict: the management appropriates owners' resources in order to improve their personal reputation by being recognized as socially and environmentally responsible executives (BUCHANAN *et al.*, 2018).

The concern with the financial results of companies has always been a basic issue for owners, and the impacts of investments in environmental, social, and governance actions on shareholders' wealth is relevant. Studies have sought to understand the relationships between ESG actions and the financial performance of companies. Dalal and Thaker (2021) found that good corporate ESG performance improves financial performance, as measured by both accounting and market perspectives. The authors highlight the relevance of the publication of

the Sustainability Report, indicating that financial performance is improved as disclosure increases, which enables a more assertive measurement of the performance of ESG actions.

On the other hand, other studies have found a negative or insignificant relationship between ESG practices and corporate financial performance. Saygili, Arslan and Ozden (2021), aiming to determine whether environmental, social, and governance practices affect corporate financial performance indicators, analyzed Turkish companies. The authors found that developing ESG actions deteriorates financial performance when analyzed as a whole; however, when the authors observed the components individually (environmental, social, and governance), they concluded that the environmental aspect has a strong negative relationship with the financial performance, while the social pillar is indifferent, and the governance one enhances the performance measured through ROA, but not through Tobin's Q.

Qureshi *et al.* (2021) analyzed the relationship between ESG actions and the financial performance of North American companies. The authors found a positive relationship between environmental, social, and governance activities with performance when measured by Tobin's Q. However, the authors identified a nonsignificant relationship when financial performance is measured using Return on Assets and Return on Equity.

In light of the above, it can be seen that many empirical studies investigate the relationship between the performance of environmental, social, and governance activities and their relationship with a company's financial performance. However, due to different research methods, variable selection, and different systems for evaluating corporate performance in ESG practices, the results are not conclusive. Accordingly, this research seeks to answer the following question: **what is the relationship between ESG corporate practices and the financial performance of B3 companies that publish Sustainability Reports?** This study measures ESG practices by building a literature-based proposed index in order to provide a broad view.

This study is expected to contribute to the literature by identifying the financial impacts of ESG practices, since this relationship is not yet established in the literature. Investors demand companies to pay attention to ESG issues, which intend to enable a responsible relationship with the environment and society through active governance, and ultimately ensure the longevity of the business in a more conscious environment.

In addition to this introductory section, this article is structured into 5 other sections. The second section presents the Theoretical Framework, in which aspects of ESG practices and of the financial performance of companies are discussed, observing the empirical evidence already found regarding the theme studied. Then, in the third section, the methodological aspects of the research are outlined, with the methodological strategy being presented with observations concerning the researched universe and the statistical tools used. In the fourth section, the results and discussion are presented, while the fifth section comprises the conclusion. Finally, the references are presented.

2. THEORETICAL FRAMEWORK

2.1 Financial performance and environmental, social, and governance activities (ESG)

With the dissemination of the concept of sustainable development and the understanding that economic growth without environmental parameters is unsustainable, the adoption of ESG practices in companies has become a way to balance financial and socio-environmental interests (HALE, 2020). ESG is based on the principles of mutual trust between business, the market and society, being guided by the concept of sustainable development and aiming to promote a harmonious relationship between the environment, society, and the interests of shareholders (DIENG; PESQUEUX, 2017).

The analysis of corporate performance in the environmental, social, and governance (ESG) dimensions also extends to the impacts of these activities on corporate financial performance. Corporate financial performance can be measured through a number of metrics that aim to identify the operational and economic-financial success of a company. Profitability is among the financial performance indicators and measures the degree of corporate success in the allocation of invested capital and can be gauged by means of some indexes.

Implementing ESG practices requires companies to consume a generous amount of organizational resources, which are not always available or have this as a priority (SONG, ZHAO e ZENG 2017). Improving the socio-environmental and governance aspects of a company requires an increase in funds, resources, especially in the short term. Thus, increasing the application of resources in these aspects will inevitably reduce the investment in the normal management of operations, so that the allocation of these inputs can impact the financial results. Companies have limited financial resources that need to be allocated efficiently to various investment activities (AHMED *et al.*, 2021).

There is a widespread view that the relationship between environmental and corporate financial performances is negative and that environmental activities cannot directly benefit the company since environmental investment can harm corporate profitability. The perception of incompatibility between environmental and financial performances may be reinforced by the inconclusive empirical results regarding this relationship (RAMIC, 2019).

One of the initial studies regarding this issue focuses on the ESG Environmental pillar, conducted by Hart and Ahuja (1996), who empirically examined the financial economics of companies that reduced GHG emissions and found an improvement in ROE and ROA. However, the authors reported that it is increasingly difficult to improve financial performance over the long term, since the investments that enable emission reductions may exceed the generated savings, although there is an initial cost reduction for most companies along with the generation of economic benefits.

In this same regard, Xiao *et al.* (2018) also found that investment in sustainable practices may not generate financial benefits. The authors analyzed industrial companies from 22 countries and concluded that in developed countries the relationship between the dimensions is negative, that is, in rich countries there is a greater difficulty in capitalizing sustainability performance in financial performance, since CSR practices are already common to most companies.

Other authors have found positive relationships in their investigations. The relationship of sustainability performance on the economic performance of organizations was also analyzed by Sila and Cek (2018), who considered the three dimensions: environmental, social, and economic. The authors found evidence that corporate environmental performance has a positive impact on financial performance, as do social activities. When the relationship of governance against economic performance was investigated, however, the empirical evidence found by the authors did not point to a significant relationship.

Monteiro *et al.* (2020) investigated the relationship between the Corporate Sustainability Index (CSI) and the economic and financial performance of companies listed on B3. The authors identified the superior performance of companies that make up the CSI against those that are not indexed to the portfolio, also identifying that being part of the CSI can improve the corporate image and may influence the decision of potential investors.

In line with this, Nguyen *et al.* (2021) investigated the relationship between environmental performance and the financial performance of Chinese companies. In order to measure environmental performance, the authors identified the most polluting companies through CO₂ emissions and identified an insignificant relationship between the dimensions. Thus, being more or less polluting does not impact the financial performance of corporations. In turn, the study by He, Ren and Zeng (2022) measured the environmental dimension through

companies' environmental labeling certification. The authors found that the environmental certification significantly improves the performance when measured by Tobin's Q, indicating the advantages of adhering to environmental standards. On the other hand, when considering the financial performance measured by ROA, the authors found a non-significant relationship.

Hypothesis H1: The performance of environmental practices influences the financial performance of companies in a positive way.

The ESG pillars complement and are related to each other. The social dimension, in turn, values equality among individuals and respect for human rights throughout society. It focuses on the promotion of a fair society with social inclusion, aiming at the extinction of poverty, the extinction of any form of human exploitation, as well as providing social welfare to local communities. (RAMIC, 2019).

In the international arena, comparing the effect of internal and external corporate social responsibility (CSR) on financial performance, Yoon and Chung (2018) used the ROA and Tobin's Q proxies. The authors identified a directly proportional relationship with CSR practices and company value, but a negative relationship with its financial performance when analyzed in its operational aspects. When analyzing the relationship between social practices and the financial performance of European companies, Taliento, Favino and Netti (2019) found that socially responsible investments do not enhance financial performance. The authors ratify, however, that their analysis focused on the short term.

Nevertheless, other studies found in the literature indicate a positive relationship between a company's social protection activities and its financial performance. Aiming to explore how environmental, social, and governance (ESG) consistency affects the company's financial performance, Ferrero-Ferrero, Fernandez-Izquierdo and Muñoz-Torres (2016) identified that the adoption of ESG practices generates a competitive advantage that constitutes an intangible value that leads to improvements in corporate performance, particularly with respect to the social dimension. Reverte *et al.* (2016) revisit the relationship between financial and environmental performances and document evidence that CSR practices are positively related to both financial and non-financial organizational outcomes.

By analyzing companies listed on B3 from 2013 to 2016, Peria *et al.* (2020) related some CSR metrics to corporate financial performance. The authors identified that CSR activities have no significant influence on the financial-economic performance of companies. Harfuch *et al.* (2021), on the other hand, compared the financial performance of the CSI and Ibovespa companies between 2009 and 2018 in order to analyze whether sustainable companies are more profitable. The authors found that companies that follow sustainability principles provide higher investment returns, as since the beginning of 2011 the CSI has outperformed Ibovespa.

Hypothesis H2: The performance of social practices influences the financial performance of companies in a positive way.

In addition to the environmental and social pillars, ESG practices also include corporate governance aspects and studies have been developed in order to understand the relationship between governance practices and the financial outcome of a company. Within the context of ESG studies, Worokinasih and Zaini (2020) investigated the impacts of corporate governance practices on the value of Indonesian companies. The authors identified that although disclosure of ESG practices does not exert influence on the value of the company, corporate governance structure has a significant and positive impact on corporate value.

When investigating the relationship between corporate efficiency and corporate sustainability to determine whether companies concerned with environmental, social, and governance (ESG) issues can also be efficient and profitable, Xie *et al.* (2019) analyzed 6,631 companies from 74 countries in 2015. The authors concluded that the higher the transparency of ESG practices, the better the financial results. The authors concluded that companies with higher levels of corporate sustainability have higher Returns on Assets (ROA) and increase their market value, further finding that governance practices are determinant in the relationship.

When analyzing the relationship between corporate governance practices, financial performance, and corporate value, Coletta and Lima (2020) investigated publicly traded Brazilian state-owned companies between 2002 and 2017. The authors identified a positive relationship between corporate performance measured by ROE and ROA and corporate value measured by Tobin's Q against the use of good corporate governance practices.

Hypothesis H3: The performance of governance practices influences the financial performance of companies in a positive way.

The environmental, social, and governance dimensions are part of the ESG theme. Thus, the analysis of ESG corporate performance can be measured in its individual components or as a whole, in order to identify its relationship with the financial performance of companies. Some studies, in turn, indicate that the adoption of ESG practices will have a positive impact on a company's future financial performance. Therefore, initial investments demand higher expenditures in the short term, while managing ESG pillars can efficiently use a company's resources and energy and attract corresponding benefits in the medium and long terms.

Empirical research has been conducted along these lines and the results found have been mixed. Xie *et al.* (2018) investigated the relationship of these dimensions to determine whether companies concerned with environmental, social, and governance (ESG) issues can also be efficient and profitable. Xie *et al.* (2018) found a relationship between the dimensions insignificant, but with a non-negative trend, indicating that voluntary choices of ESG strategies can be beneficial.

By analyzing this relationship, Ingio and Albareda (2019) investigated leading companies in promoting sustainability-driven innovation, measured through ESG scores. The authors found that sustainability-driven innovation positively influences financial performance as well as boosts competition. In companies from developed countries, Garcia and Orsato (2020) find a positive and statistically significant relationship between ESG performance and financial performance, but a negative correlation between these dimensions in emerging market companies.

The results of Ahmad, Mobarek and Roni (2022), who analyzed FTSE350 companies in the UK, found that companies with high ESG present high financial performance compared to companies with low ESG. The results for total ESG performance indicate that ESG has a positive and significant impact on the company's financial performance. However, in the case of individual ESG performance, the results are mixed. The authors indicate that social and governance performance have a positive and significant impact on performance, while environmental performance is negative.

In the national context, Anzilago, Flach and Lunkes (2022) investigated the effects of corporate social responsibility (environmental and social) on financial performance, also observing the role of corporate governance in this relationship. The authors concluded that environmental corporate social responsibility has an influence on the financial performance measured by the ROA of Brazilian companies. On the other hand, when financial performance is measured by Tobin's Q, environmental, social and governance responsibility does not influence performance.

Hypothesis H4: Corporate ESG practices in the current year will have a positive impact on a company's future financial performance.

3. METHODOLOGY

The present study is characterized as descriptive and empirical, since it aims to test a hypothesis or estimate relationships among variables, with a quantitative approach being used (WOOLDRIDGE, 2006). The population of the survey comprises all Brazilian publicly traded companies listed on B3, with information from 2010 to 2021. Some criteria were adopted for the selection of companies that make up the sample of this study: first, the disclosure of the Sustainability Report by the company was observed, in order to build the proxy for measuring corporate performance in ESG (environment, social, and governance). The second criterion is to verify if the company's current situation is active in 2021, excluding companies with a canceled registration.

As for the exclusion criteria, the following conditions were considered when removing companies from the sample:

- a) belonging to the finance and insurance sector,
- b) lack of complete information in the financial statements,
- c) having negative shareholders' equity.

To represent financial performance as dependent variables in this study, two proxies were used. Thus:

a) Return on Assets (ROA) - measures Return on Assets, observing the internal performance in the balance sheet. Estimated by the ratio between net income ("NI") and total assets ("TA"), i.e., $ROA = NI/TA$.

b) Tobin's Q - aims at relating the company's market value with the replacement cost of its physical assets, initially proposed by Tobin and Brainard (1968), and Tobin (1969). In this study, the Tobin's Q used will be the approximation proposed by Chung and Pruitt (1994), where:

$$\text{Tobin's Q} = \frac{(MV_{cs} + D)}{TA} \quad (1)$$

Where:

Tobin's Q – approximation to the original Tobin's Q

MV_{cs} - Market value of the common stock traded on the stock exchange, calculated by the product of the quantity of the company's shares and the quoted price on the last trading day of the year in question.

TA - Total Assets of the company, measured at book value.

D - Debt book value, calculated as:

$$D = MV_{ps} + LTLb + VIb + CLb - CAb \quad (2)$$

Where:

MV_{ps} - Market value of the company's preferred shares

LTLb – Amount of the company's long-term book debt, i.e., long-term liabilities

VIb - Value of the company's book inventory

CLb - Amount of the accounting short-term debt, that is, the company's book Current Liabilities

CAb - Value of the company's current resources, i.e., the company's book Current Assets.

Equation (1) can be written as follows:

$$\text{Tobin's Q} = \frac{MV_{cs} + MV_{ps} + LTLb + VIb + CLb - CAb}{TA} \quad (3)$$

The independent variable is the proxy of the ESG Corporate Practices Index (ESGI). Figure 1 below shows the control variables to be used in this empirical investigation, as well as the theoretical framework for their choice:

Figure 1 – Control variables of the model

Variável	Sigla	Operacionalização	Referências
Tamanho	TAM	Ln do Ativo Total	Song, Zhao e Zeng (2017); Li et al., (2020); Coletta e Lima (2020)
Alavancagem	ALAV	Passivo oneroso/Ativo Total	Song, Zhao e Zeng (2017); Li et al., (2020)
Crescimento	CRESC	$(Receita_{t+1}/Receita_t) - 1$	Xie et al. (2018); Saygili, Arslan e Birkan (2021)
Intensidade Energética	INTENE	Variável binária igual a 1 se a empresa opera nos setores químico, siderúrgico, metalúrgico, de papel e celulose, petróleo, gás e biocombustíveis, geração, transmissão e distribuição de energia elétrica, eletricidade, água, transporte e zero, caso contrário.	Lee, Min, Yook (2015); Xie et al., (2018)

Source: elaborated by the authors (2022)

The data comprise the period from 2010 to 2021 and were collected through secondary sources by the researcher. In this sense, the companies' accounting information was obtained from the Economática database. The information to measure ESG corporate performance was obtained from the Sustainability Reports, published by the companies and available on the RAD platform (Automated Document Receipt) of the Securities and Exchange Commission of Brazil (CVM), where documents from listed companies can be consulted, as well as on the companies' websites.

As Sustainability Reports are of voluntary disclosure, there is no formal model to be adopted. Thus, reports issued in the GRI standard and others disclosed were considered. At first, Sustainability Reports would also be collected from the Sustainability Disclosure Database of the Global Reporting Initiative (GRI), but this initiative was discontinued and the database is no longer publicly available. In order to measure the protection of minority shareholders' rights, it was necessary to search the Reference Reports of companies with preferred shares. The preparation of graphs and tables for the initial treatment of the data was done with the help of Microsoft Excel and the regression estimates with the help of Stata 13 software.

In order to build a proxy to measure ESG corporate performance, the studies by Almeida and Santos (2016), Xie *et al.* (2018), and Li *et al.* (2020) were used as background. Thus, a questionnaire was designed to generate the ESG Corporate Practices Index (ESGI). Responses were obtained from Sustainability Reports, from the RAD / CVM database, from the companies' websites, and from the Reference Report.

The value of the ESG Corporate Practices Index (ESGI), therefore, was obtained by adding up the positive responses to 30 objective and binary questions answered through the analysis of the Sustainability Reports. Thus, 1 (one) point was added to the index when the disclosure of a certain item by the company was verified; and (zero) otherwise. Thus, the performance score of the analyzed companies was between 0 and 30. The complete questionnaire used in this survey can be seen in Chart 1 below.

Chart 1 - Questionnaire for building the proxy ESG Corporate Practices Index (ESGI).

Composition of the ESG Corporate Practices Index (ESGI)	
No.	QUESTION

Environmental Dimension (ED)	
Q1	The company establishes environmental goals and objectives
Q2	The company has some certification or compliance with environmental laws and regulations
Q3	The company has environmental awards and/or participates in environmental indexes
Q4	Existence of terms and conditions applicable to suppliers regarding environmental practices
Q5	Independent verification on environmental information disclosed in the Sustainability Report
Q6	Participation in economic sector-specific associations/initiatives to improve environmental practices
Q7	The company has a program to improve water use and/or water use efficiency
Q8	The company has a program to manage the release of toxic waste and/or promotes waste management through recycling, reuse, reduction, treatment and disposal
Q9	The company discloses the environmental impacts of products/services, and indicates solutions for biodiversity preservation and impacted environmental conservation
Q10	The company has implemented some initiative to make its energy use more efficient
Social Dimension (SD)	
Q11	The company has made a commitment through a program to ensure non-discrimination against any kind of minority group
Q12	The company has implemented initiatives to train new and existing employees in career development, education or competencies
Q13	The company has some kind of health, hygiene and safety policy at the workplace
Q14	The company has women or minorities in management positions
Q15	The company has day-care assistance and/or scholarships for employees' children
Q16	The company has maternity and paternity support
Q17	The company maintains an employee profit-sharing program
Q18	The company promotes actions to encourage culture and/or sports in society
Q19	The company invests in projects of education in society
Q20	The company has actions to combat hunger and promote food security
Corporate Governance Dimension (GD)	
Q21	The positions of CEO and Chairman of the board are held by different people
Q22	There is female presence in the highest corporate governance organ
Q23	The percentage of the company's institutional investors is higher than 50%
Q24	The company maintains a profit-sharing program for managers
Q25	The company has an incentive plan for managers concerning the purchase of stock options
Q26	The company maintains a level 2 or 3 ADR program on a North American stock exchange
Q27	All the company's shares are common shares, or the company's bylaws grant preferred shares the right to vote, either fully or restricted to special matters
Q28	All the company's shares are common shares or preferred shares have priority in the reimbursement of capital in case of liquidation of the company
Q29	There is an environmental/ sustainability committee linked to the Board of Directors
Q30	Executive pay is linked to environmental performance

Source: Elaborated by the authors, based on Almeida and Santos (2016), Xie *et al.* (2018), and Li *et al.* (2020)

In order to investigate the relationship between ESG practices and Corporate Financial Performance of B3 companies that published Sustainability Reports from 2010 to 2021, multiple linear regression analyses by ordinary least squares (OLS) with panel data were conducted. Considering that the publication of Sustainability Reports occurs, on average, between the months of July and September of the year following the base year, it was not possible to measure ESG Corporate Performance for 2021. The model is presented below:

$$D_{i,t+1} = \beta_0 + \beta_1 IESG_{i,t} + \beta_2 D_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 GROWTH_{i,t} + \beta_7 INTENE_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where:

$P_{i,t}$ – Performance, which can be measured through Return on Assets (ROA) and Tobin's Q for company i in period t ,
 $ESGI_{i,t}$ - Corporate ESG Practices Index (ESGI) of company i in the period t ,
 $SIZE_{i,t}$ – Size of company i , in period t ,
 $LEVI_{i,t}$ – Leverage of company i , in period t ,
 $GROWTH_{i,t}$ – Growth of company i , in period t ,
 $INTENE_{i,t}$ – Energy Intensity of company i 's sector, in period t ,
 β_n – regression parameters, with $n = 0, 1, 2, 3, \dots 7$,
 ε – regression estimated error term,
 i - indicates the company, with $i = 1, 2, 3, \dots N$,
 t – indicates the period of occurrence, with $t = 1, 2, 3, \dots T$.

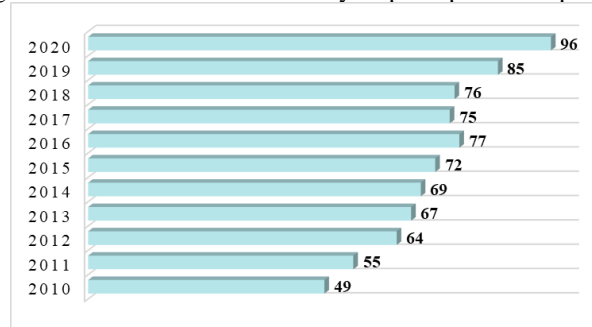
4. ANALYSIS OF RESULTS

This chapter presents the results of the study, considering the application of the methodological procedures described in the previous chapter, in order to achieve the general objective. Initially, the proxy for measuring companies' ESG corporate performance, called the ESG Corporate Practices Index (ESGI), is analyzed. Next, descriptive information and statistics regarding the sample and variables of the study are presented, and finally, the relationship between ESG corporate practices and the financial performance of companies is investigated.

With regard to the publication of Sustainability Reports, as can be seen in Figure 2, an average of 71 reports were presented per year. There was an increase by over 51% in the number of companies that issued the document with ESG activities between 2010 and 2020, which were 49 and 96, respectively. Figure 2 also shows that the number of Sustainability Reports published increased over the years, as more companies began to make voluntary disclosure.

Since for each company a Sustainability Report was analyzed, 49 companies were considered in 2010, 55 in 2011, 64 companies in 2012, and so on. Note that between 2016 and 2019 there was a decrease in the publication of the Sustainability Report. Thus, a total of 785 reports were considered, belonging to 109 companies, over the years surveyed.

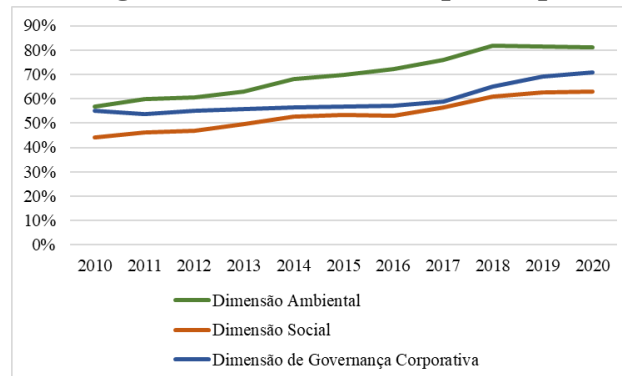
Figure 2 - Number of Sustainability Reports published per year



Source: The authors (2022)

To measure ESG corporate performance, a proxy called Corporate ESG Practices Index (ESGI) was devised. Figure 3 shows the evolution of the score of ESGI dimensions (environmental, social, and governance). Since the number of questions was the same in all dimensions, the Social dimension seems to be the one that has received the least attention from companies, while the Environmental issue has the highest score. On the other hand, in all three dimensions an increase in positive responses is observed over the years, especially from 2014-2015, which suggests that companies are attentive to market demands, increasing more and more their ESG activities.

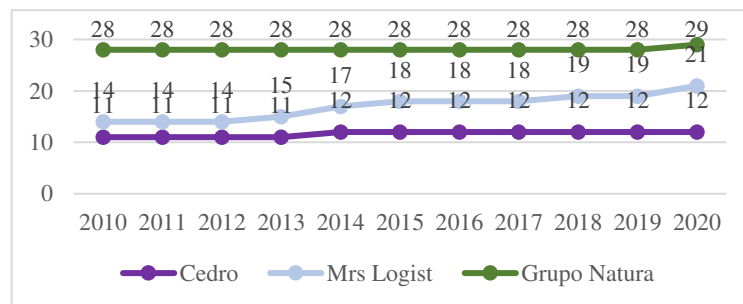
Figure 3 - Evolution in the number of positive answers per dimension (environmental, social, and governance) of ESG corporate performance



Source: The authors (2022)

The ESG corporate performance of some companies draws attention in view of the low score values assigned throughout the period of analysis. Company Cedro, for example, maintained its score between 11 and 12 points throughout the analyzed period, as can be seen in Figure 4. On the other hand, some companies improved their ESG performance over the period under analysis, such as Mrs Logist. In 2010 the company's score was 14 points, while in 2020 the score rose to 21, as can be seen in Figure 4. Other analyzed companies maintained better scores in the ESGI, as is the case of the Natura Group. As can be seen in Figure 3, their score was always above 28 points, reaching 29 in 2020. This was the highest score identified among the companies in the sample.

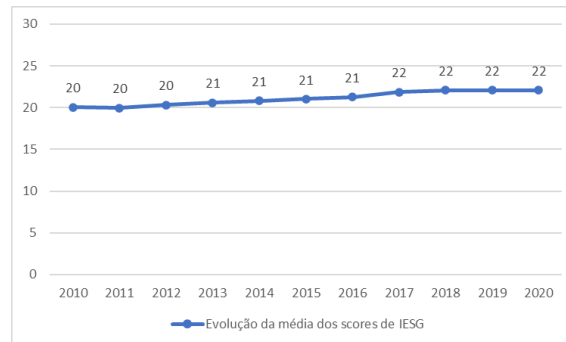
Figure 4 - Score of companies Cedro, Mrs Logist and Natura Group in the ESGI



Source: The authors (2022)

Finally, in Figure 5 it is possible to identify the evolution of the ESGI over the surveyed years. On average, there is a growth in the scores of the companies between 2010 and 2020. When analyzing company Cedro, whose score is highlighted in Figure 4, it stands out how low the score achieved by this company is, even when compared to the mean of the companies in the sample. On the other hand, Mrs Logist had a consistent growth and approached the mean of the companies in 2020, reaching a score of 21. Natura Group kept its score above the mean of the other companies since 2010, and this is constant up to the end of the period.

Figure 5 - Growth of the mean score of the companies in the ESGI



Source: The authors (2022)

Once the characterization of the sample has been completed, the descriptive statistics of the study variables are presented next. From now on, the descriptive statistics of the variables used by this study to achieve the proposed objective are presented and analyzed. As can be seen in Table 1, the sample companies have, on average, a Return on Assets (ROA) of 0,4494, while in financial performance, measured by Tobin's Q, there is an average of 4,3572, suggesting that they are well evaluated by the market. Another variable of the study is the ESG Corporate Performance Index (ESGI), indicating that, on average, companies achieved a score of around 21 points. Considering that 30 points is the maximum to be achieved, they can be considered to be aligned with ESG issues. However, the dispersion of these scores by almost 5 points indicates that there are still many companies that need to improve their attention to ESG. This can also be observed by considering the variable's 18-point range, since at least one company scored only 11 points, while another reached the maximum of 29.

Table 1 - Descriptive statistics of the study variables

Descriptive statistics of the study variables are presented, measured through proxies Financial Performance, measured by Return on Assets (ROA) and Tobin's Q; Composition of Corporate ESG Practices Index (ESGI), Size (SIZE), Leverage (LEV), Growth (GROWTH) and Energy Intensity of the sector in which the company operates (INTENE).

Variables	No of observations	Mean	Standard Deviation	Maximum	Minimum
ROA	1132	0,4494	0,0612	1,5535	-0,2671
Tobin's Q	1128	4,3572	3,9520	11,6817	-0,04793
ESGI	785	21,02	4,4884	29	11
ED	785	8,76	1,7830	10	2
SD	785	4,58	2,0867	10	0
GD	785	6,68	1,9908	10	1
SIZE	1199	16,2057	1,4946	7,3112	20,9607
LEV	1120	0,2274	0,1479	1,7263	0
GROWTH	1107	1,3302	4,4572	-0,7983	17,3159

Source: The authors (2022)

In addition to analyzing the ESG corporate performance in its complete form in the three dimensions, it was also observed in its parts. In the environmental dimension, it scored an average of 8,76 points; as for the social commitment aspects, it obtained an average of 4,57 points, indicating fragility in this aspect, where they still need to evolve significantly; regarding the governance dimension, they obtained an average of 6,68 points, which can be considered very reasonable, since they were well evaluated in approximately 67% of the surveyed questions. In all dimensions, maximum scores (10 points) were identified; however, it is possible to verify the dispersion of results by about 20% in the social and governance dimensions among the companies. This reinforces the idea that companies pay more attention to issues related to the environment, which may be due to greater awareness by investors and regulators, who demand better actions from companies in a more effective way.

Now the results of the multiple linear regression analyses by ordinary least squares (OLS) with panel data performed in the estimation of the models proposed by this study are presented. The financial performance was measured through Return on Assets and the robustness of the model was tested with the market metrics (Tobin's Q). To determine which panel data model has the most appropriate application for the proposal of this study, the Chow test (Chow F) was applied so as to compare the estimates of the pooled model with the fixed effects model (unrestricted). In this test, the null hypothesis, which indicates a better model adequacy, the pooled one was rejected, considering the measurement through ROA and Tobin's Q. Therefore, the adoption of the fixed effects model (unrestricted) was more appropriate. To verify whether the random effects model was more appropriate than the pooled model, the Breusch-Pagan test was applied. As in the first test, a p-value of lower than 0,05 was identified and, therefore, the null hypothesis that the pooled model would be more appropriate was also rejected.

To determine, yet, if the random effects model would have a more appropriate application than the fixed effects model, the Hausman Test was applied. Considering the measurement through ROA and Tobin's Q, the null hypothesis that the random effects would be consistent was also rejected, concluding that the panel data model with fixed effects is more appropriate. Thus, the estimation was made with unbalanced panel data with fixed effects, containing at least 3 observations per company in the 11 years analyzed, and companies with fewer observations were removed. The main results of the regressions are presented in Table 2 below.

Table 2 - Regression Results: ESG, Environmental Commitment and ROA

The dependent variable of the model is Return on Assets (ROA_{t+1}). The model's independent variables are ESGI and the financial performance in the current year (P_t). The dimensions that make up the Composition of ESG Corporate Practices Index (ESGI) are ED - environmental dimension, SD - social dimension, GD - corporate governance dimension). The control variables of the model are size, (SIZE), leverage (LEV), growth (GROWTH) and the energy intensity of the sector in which the company operates (INTENE). The results of the estimated parameters (coefficients), the standard error and the t statistics are presented, respectively. ***, ** and * correspond to statistical significance at the 1%, 5% and 10% levels, respectively.

Variables	Dependent variable: ROA_{t+1}		Dependent variable: Tobin's Q_{t+1}	
	Model 1	Model 2	Model 3	Model 4
ESGI	0,1046**	-	0,1975**	-
ED	-	0,1945**	-	0,1984**
SD	-	-0,0973	-	-0,0928
GD	-	0,1088**	-	0,1774**
ROA_t	0,3916**	0,3827**	0,2691**	0,9982**
SIZE	0,8137**	0,1107**	0,9275**	0,1093**
LEV	-0,3776**	-0,2960**	-1,5542**	-1,4782**

GROWTH		-0,0289	0,0339	0,6173	0,6237
INTENE		0,1004**	-0,0968	-0,1258**	-0,5867**
Constant		0,0955**	0,0095**	1,7897**	2,0495**
R ²		36,19%	33,07%	35,76%	31,82%
Number of observations		712	712	712	712
Chow F	<i>p-value</i>	0	0	0,0000;	0,0000;
Breusch-Pagan:	<i>chi²</i>	93,17	81,82	31,05	29,13
	<i>p-value</i>	0	0	0	0
Hausman:	<i>chi²</i>	36,91	33,24	73,84	68,26
	<i>p-value</i>	0	0	0	0

Source: The authors (2022)

Table 2 shows that financial performance, when measured by ROA, is impacted by ESG corporate performance, according to Model 1. These results are in line with the studies by Xie *et al.* (2018), who found that ESG practices have positive and significant effects on the Return on Assets of Japanese companies.

ESG corporate performance was analyzed in its whole, but also in the dimensions that compose it (ED - Environmental dimension; SD - Social dimension; and GD - Corporate Governance dimension), and the results are presented in Model 2. In this way, it is possible to analyze which of the ESG aspects has more influence - and in which sense (negative or positive) - on the companies' financial performance. Here, too, the linear regression with fixed effects was used, in an unbalanced panel.

When we analyze the financial performance (ROA), considering the ESGI dimensions - environmental (ED), social (SD), and governance (GD) (Model 2), we observe that the environmental and governance dimensions presented a positive relationship, with significance. The social dimension (SD), on the other hand, indicated a negative relationship with the companies' performance, not being enough to guarantee the relationship, since the result was not statistically significant. Therefore, it is identified as the weakest dimension of the ESGI. Similar to the model with full ESGI, the influences (with significance) of the previous year financial performance (Pt), size (SIZE) and leverage (LEV), maintain the sense of their relationships with performance. On the other hand, the energy efficiency of the sector (INTENE) lost its power to influence the financial performance, because besides inverting the sense of the relationship, which became negative, it has no longer presented significant results. Similarly, the growth variable (GROWTH) inverted the direction of its relationship with ROA, but continued not presenting a significant result, not being possible to infer anything about it given the inconstancy of the direction of its relationship in the models.

Mixed results of these three dimensions and their connections with financial performance are found in the literature. These results are in line with those identified by Sila and Cek (2018) with respect to the environmental dimension, the authors finding that corporate environmental actions have a positive impact on financial performance. However, Sila and Cek (2018) found evidence that the governance dimension is indifferent, while social governance activities improve financial performance.

This result is also corroborated by those by Xie *et al.* (2018), who observed a positive relationship between environmental and governance practices with financial performance. The authors did not identify significance of the social dimension either, but in their study, through coefficient analysis, they found a non-negative relationship, which was also found by this study, since the coefficient of the social dimension indicates toward a positive relationship, reinforcing no statistical significance of this dimension.

Garcia and Arango (2020), in turn, reported that the environmental dimension can cause a deterioration in financial performance, while Worokinasih and Zaini (2020) suggested that

the corporate governance structure has a significant and positive impact on corporate value and financial performance. These authors justified their results by stating that they stem from the greater transparency of ESG practices, which better promote the financial results.

The financial performance (Tobin's Q) was also found to be positively impacted by the performance of ESG practices (ESGI). The results linking the relationship between ESG corporate performance and Tobin's Q have been found in studies such as those by Qureshi *et al.* (2021) as well. The authors also found that when performance is measured by Tobin's Q, ESG practices improve financial performance. However, Weston and Nnadi (2021), considering the North American market, found evidence that there is no inherent financial benefit in performing ESG actions.

The empirical evidence found by Ren and Zeng (2022) also maintained this same sense. When measuring ESG performance through certifications corresponding to the dimensions that are part of it, the authors concluded that ESG practices significantly improve performance when measured by Tobin's Q, but not when measured by ROA, when a non-significant relationship was found.

When analyzing the ESG dimensions individually, environmental and governance practices were found to positively impact financial performance. On the other hand, the model lost explanatory power, indicating that looking at ESG practices as a whole may be more appropriate.

The results presented for ROA were maintained, indicating loss of explanatory power of the social dimension (SD), which even without significance, points out that attention to these issues suggests a reduction in the performance of companies. It is worth mentioning that the exception observed among the variables concerns INTENE, which measures the sector's energy efficiency that did not maintain its negative influence statistically significant with Tobin's Q. The market negatively assesses companies that are more expensive in energy expenditure. In turn, good corporate governance and environmental care practices have improved financial performance.

Regarding the social dimension, which showed a negative relationship (not statistically significant) with the financial performance (ROA and Tobin's Q), the findings corroborate the studies by Vergini *et al.* (2015), who reported a negative relationship between the companies' income and the internal social investment, that is, in employees and internal processes. Similarly, Taliento, Favino and Netti (2019) found that social practices do not enhance the financial performance of the European companies analyzed by the authors.

Likewise, Saygili, Arslan and Birkan (2021) identified a negative relationship between the environmental dimension and financial performance, which was also positively influenced by social actions. Finally, the results of the analysis of the effect of each of the ESG dimensions partly corroborate the evidence found by Qureshi *et al.* (2021). The authors concluded that the commitment reported with the environmental pillar and a strengthened governance mechanism can improve the performance measured by Tobin's Q, but not by ROA (the authors found a link with the accounting measurement of ROE - Return on Equity).

On the other hand, this result goes against the evidence identified by Ramić (2019), who found that positive results on a company's social performance impacts its financial performance when looking at economic-financial performance indicators ROA, ROE and Tobin's Q for listed companies around the world. Another study conducted in the national context by Anzilago, Flach and Lunkes (2022) also found evidence that a company's social activities are able to improve its financial performance. The authors detected a positive influence of social environmental responsibility and governance on the performance of Brazilian companies in ROA, but not in Tobin's Q.

5. CONCLUSION

When investigating the relationship of ESG corporate practices with the financial performance of companies over the study period, it was found that the financial performance is positively associated with the company's size and the sector in which it operates, with a negative impact of the sector's energy intensity. The ESG activities performed are able to positively influence the financial performance. These results are in line with those of Qureshi *et al.* (2021), as well as those of Ren and Zeng (2022), who found a non-significant relationship of ESG practices upon ROA.

The influence of ESGI on ROA was observed, these results being in line with some studies in the literature, such as that by Xie *et al.* (2018), which found that ESG practices have positive and significant effects on the Return on Assets of Japanese companies. On the other hand, evidence goes against the studies by Cornell and Damodaram (2020), and Weston and Nnadi (2021), who identified that ROA is not impacted by ESG practices. ESG corporate performance was considered in its totality, as well as in the dimensions that are part of it (ED - environmental dimension; SD - social dimension; and GD - Corporate Governance dimension). Size, financial performance of the previous year, and leverage were found to be significant and to have respectively a positive, positive and negative relationships. The environmental and corporate governance dimensions produce positive effects on financial performance. The influence of environmental and corporate governance practices on the financial result has also been confirmed by Worokinasih and Zaini (2020), who suggest that the corporate governance structure has a significant and positive impact due to this dimension's characteristic of promoting transparency. In turn, Saygili, Arslan and Birkan (2021) also corroborate the relevance of the governance dimension in Tobin's Q. Qureshi *et al.* (2021) concluded that a commitment to the environmental pillar and a strengthened governance mechanism can improve performance as measured by Tobin's Q, but not by ROA.

This study contributes to the literature by finding a positive relationship between ESG practices and financial performance. However, some limitations also need to be highlighted. A first aspect concerns the fact that it is not an easy task to measure corporate performance on environmental, social, and governance issues. In this sense, it is possible that some relevant aspect was missed (not perceived) and this may have impacted the results. Another limitation concerns the still low number of companies that disclose their Sustainability Reports, especially with consistency and external verification of the disclosures they make. As recommendations for future research, we suggest improving the measurement of the proposed proxies (ESGI and environmental commitment). It is also possible to consider each of the questions applied to compose the ESGI as dependent variables of the model in order to specify which aspects are more relevant to the financial performance.

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