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ANA VIRGINIA ARAGÃO DE OLIVEIRA

ESG DID NOT IMMUNIZE STOCKS DURING THE COVID-19

CRISIS: A STUDY BASED ON BRAZILIAN COMPANIES

LISTED IN THE INDEX PORTFOLIO - ISE B3

São Paulo

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ANA VIRGINIA ARAGÃO DE OLIVEIRA

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INDEX PORTFOLIO - ISE B3**

Dissertação apresentada ao Programa de Mestrado em Ciências Contábeis do Centro Universitário Álvares Penteado, como requisito para a obtenção do título de Mestre em Ciências Contábeis.

Orientador: Prof. Dr. Alexandre Sanches Garcia

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São Paulo, August 23, 2023.

To my husband, Marcello for his endless support and for celebrating each step of this journey with me. To my parents, Paulo and Dorinha, for teaching me that all my dreams can be achieved.

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Abstract

Oliveira, Ana Virginia Aragão de. (2023). *ESG did not immunize stocks during the COVID-19 crisis: A study based on Brazilian companies listed in the index portfolio - ISE B3*. Centro Universitário Álvares Penteado, Fundação Escola de Comércio Álvares Penteado - FECAP, São Paulo, SP, Brasil.

The COVID-19 pandemic generated an unparalleled stock market crash in 2020. Considering that the Brazilian financial market faced an unprecedented scenario combined with the high volatility of stock prices caused by the uncertainties of the crisis, it is a unique opportunity to evaluate the ESG performance as a factor of protection for stock prices. This research aims to analyze whether the ESG score was a determining factor for the protection of stock prices during the period of the COVID-19 pandemic, specifically during the market crash in 2020 (March 2020) and for the full year of 2020, comparing the companies that are part of the ISE B3 portfolio from Ibovespa with those not listed in this portfolio. For this, data were collected on the Refinitiv Eikon® platform, and an analysis was performed using the event study methodology for both periods. This research shows that, due to the abnormal return regressions, companies with ESG scores listed in the ISE B3 portfolio did not show statistically significant results during the 2020 COVID crisis, specifically in March of 2020. It is concluded that ESG did not immunize stocks during the COVID-19 crisis.

Keywords ESG Scores. ISE B3. COVID-19 Crisis. Economic Crisis. Stock Prices.

Resumo

Oliveira, Ana Virginia Aragão de. (2023). *ESG não imunizou as ações durante a crise do COVID-19: Um estudo com base nas empresas brasileiras listadas na carteira do índice - ISE B3*. Centro Universitário Álvares Penteado, Fundação Escola de Comércio Álvares Penteado - FECAP, São Paulo, SP, Brasil.

A pandemia do COVID-19 gerou uma queda sem precedentes no mercado de ações em 2020. Considerando que o mercado financeiro brasileiro enfrentou um cenário inédito aliado à alta volatilidade dos preços das ações causada pelas incertezas da crise, é uma oportunidade única para testar o desempenho ESG como fator de proteção dos preços das ações. Esta pesquisa tem como objetivo analisar se o índice ESG foi um fator determinante para a proteção dos preços das ações durante o período da pandemia da COVID-19, especificamente durante o *market crash* em 2020 (primeiro trimestre) e durante todo o ano de 2020, comparando as empresas que fazem parte da carteira ISE B3 da Ibovespa com aquelas não listadas nesta carteira. Para isso, foram coletados dados na plataforma Refinitiv Eikon®, e realizada uma análise utilizando-se a metodologia de estudo de eventos para ambos os períodos. Como resultado das regressões de retorno anormal, as empresas com pontuação ESG listadas na carteira ISE B3 não apresentaram resultados com significância estatística durante a crise de COVID de 2020, especificamente no primeiro trimestre de 2020. Dessa forma, a pesquisa sugere que o ESG não imunizou as ações durante a crise de COVID-19, no ano de 2020.

Palavras-chave: Pontuações ESG. ISE B3. Crise COVID-19. Crise Econômica. Preços das ações.

List of Tables

Table 1 - Pillars of ESG.....	16
Table 2 - Thomson Reuters ESG Scores	18
Table 3 - Previous Research	23
Table 4 - Sample Definition	28
Table 5 - Sample by economic sector – 2020.....	29
Table 6 - Variable definitions and sources	31
Table 7 - Average ESG Scores by SIC – Period 1 – March 2020.....	34
Table 8 - Average ESG Scores by SIC – Period 2 – Full Year of 2020.....	35
Table 9 - Descriptive Statistics by Variable – Period 1 – March 2020	35
Table 10 - Descriptive Statistics by Variable – Period 2 – Full Year of 2020	36
Table 11 - Correlation between variables – Period 1 – March 2020.....	38
Table 12 - Correlation between variables – Period 2 – Full Year of 2020.....	39
Table 13 - Abnormal Results – CAAR.....	41
Table 14 - Summary of the Tables’ Results	41
Table 15 - OLS – ESG – March 2020	42
Table 16 - OLS – ESG – Full Year of 2020	43
Table 17 - OLS – ENV – March 2020.....	45
Table 18 - OLS – ENV – Full Year of 2020	46
Table 19 - OLS –SOC – March 2020	47
Table 20 - OLS –SOC – Full Year of 2020.....	48
Table 21 - OLS – GOV – March 2020	49
Table 22 - OLS –GOV – Full Year of 2020.....	51
Table 23 - Summary of the results.....	52

List of Figures

Figure 1 - IBOV 2020 evaluation in Brazilian Reais (R\$).....	13
Figure 2 - Steps for the Event of Study	27
Figure 3 - The Event Study Timeline	28

Summary

1 Introduction	10
1.1 Research question	12
1.2 Objectives	13
1.3 Justifications and contributions	14
1.4 Delimitations	15
1.5 Research Structure	15
2 Literature Review	16
2.1 ESG concept and the ESG indexes.....	16
2.2 Stakeholder theory	19
2.3 Previous studies	20
2.4 Hypotheses.....	25
3 Methodology.....	27
3.1 Event study timeline	28
3.2 Field of study and sample	28
3.3 Variables studied and data analysis.....	29
4 Results.....	34
4.1 Descriptive statistics	34
4.2 Correlation between variables.....	36
4.3 Event study results	40
4.4 Results of the regression – Ordinary Least Squares Estimates (OLS).....	41
5 Conclusion	53
References.....	55

1 Introduction

The COVID-19 pandemic officially began in March 2020 after the declaration published by the World Health Organization (WHO) (2020). This period represented a milestone in the world history of public health. It has negatively affected global economic activities (Demers, Hendrikse, Joos, & Lev, 2021) and generated the most challenging social and economic crisis the world has faced since World War II (Folger-Laronde, Pashang, Feor, & ElAlfy, 2020).

Historically, organizations have often faced crisis. However, the COVID-19 pandemic may be unique given its sheer scale and contemporaneous impact on health and well-being and the global impact on companies' financial statements and survival (Mather, 2020). The outcomes of this pandemic have been unprecedented and far-reaching, affecting every country in the world. These results are ongoing and will continue to be felt for years to come as countries work to recover from the pandemic and adjust to a new normal.

There are critical impacts on a global scale and in the financial markets represented in the Organization for Economic Cooperation and Development (OECD) Economic Outlook, Interim Report 2020, and on the research from Huang and Ye (2021), WHO (2020), Davies and Wenham, (2020), Singh and Mishra (2021), Albuquerque, Koskinen, Yang and Zhang (2020), and Demers et al. (2021) as following:

- a) public Health: The COVID-19 pandemic has caused millions of deaths and illnesses worldwide, overwhelming healthcare systems and putting enormous pressure on medical professionals.
- b) economic: The COVID-19 pandemic has created economic uncertainty, with many businesses being forced to close, people losing their jobs, and global supply chains disrupted. This uncertainty has led to decreased consumer spending and investment, which has further impacted financial markets.
- c) social: COVID-19 has led to social isolation, disrupted education, and exacerbated mental health issues.
- d) political: COVID-19 has strained international relations, with countries blaming each other for the spread of the virus and has led to changes in political priorities and policies.
- e) environment: COVID-19 has decreased greenhouse gas emissions and air pollution due to reduced industrial activity and travel, but it has also led to increased medical waste and single-use plastics.

- f) stock market volatility: The pandemic led to a sharp decline in stock markets worldwide in the early stages of the outbreak, with many markets experiencing their worst quarter in years.
- g) changes in interest rates: Central banks worldwide have reduced interest rates in response to the pandemic to stimulate economic growth. Lower interest rates can lead to increased borrowing and investment but also inflation and other economic challenges.
- h) increase in government debt: Governments worldwide have had to increase spending to support businesses and individuals during the pandemic, increasing government debt, which can impact financial markets and economic stability.
- i) shifts in industry focus: The pandemic has led to shifts in industry focus, with some experiencing significant growth while others struggle. For example, technology companies have seen significant growth due to the shift to remote work and increased demand for digital services.

The COVID-19 pandemic has crucially impacted financial markets. Pisani and Russo (2021) emphasized that the world needed to reactivate the economy as quickly as possible, focusing on sustainable management. One of the possible tools to address this trade-off is financing responsibly.

In several instances, the ongoing crisis has accelerated the pre-existing trends toward greater Environmental, Social, and Governance (ESG) integration by underscoring the role of business in facing broader societal issues (Gerber et al., 2020). The COVID-19 pandemic increased ESG attention from governments and market participants, and, for example, social and environmental issues are at the core of the recovery plan in many countries (Bae, Ghoul, Gong, & Guedhami, 2021).

The United Nations [UN] (2020) announced that as countries move toward rebuilding their economies after COVID-19, recovery plans have the potential to shape in manners that prioritize environment, sustainability, health and safety. The current crisis is an opportunity for a profound systemic shift to a more sustainable economy that works for both people and the planet. The U.N. Secretary-General proposed six climate-positive actions for governments to take once they go about building back their economies and societies:

- a) green jobs: “sustainable and inclusive growth.”
- b) no Bailout For Polluting Industries: “acceleration of the decarbonization of all economic aspects.”
- c) end the fossil fuel subsidies: “Polluters must pay for their pollution.”
- d) climate In All Decisions: “take climate risks and opportunities into account in all financial and policy decisions.”
- e) work together to recover better: “Public development banks across the world will need to work together to help countries adapt to climate change”. That includes “identifying and financing low-carbon, high-productivity activities and designing appropriate industrial policies, scaling up their resources in sustainable infrastructure, and supporting a just transition for workers and communities.”
- f) leave No One Behind: “Action to limit climate change is to achieve Sustainable Development Goals for all countries and all people.” (United Nations [UN], 2020).

The literature provides contradictory results regarding the influence of ESG activities on potentially improving companies’ financial performance. Thus, the importance of this study lies in highlighting the significance of ESG activities as measured by ESG Scores during the COVID-19 pandemic, specific for Brazilian public companies during the year of 2020.

1.1 Research question

The Ibovespa index (*Índice Bovespa or Ibovespa*), Brazil’s Stock Exchange (B3) benchmark stock market index, is a capitalization-weighted index that tracks the performance of the most traded stocks in the exchange, representing about 80% of the total market capitalization of the Brazilian stock market (B3, 2020). It was created in 1968 and it is one of Latin America’s most important stock market indexes. Over the last 50 years, this index has set a benchmark for investors worldwide. The review of its composition is quarterly, and the companies included in the index portfolio must meet specific eligibility criteria, such as trading volume and market capitalization (B3, 2020).

It is essential to highlight the timeline of some important events that occurred during the market crash in Brazil. On February 26th, 2020, the Brazilian Financial Market began to impound, dropping significantly, 7% at once. The panic peak happened on March 11, 2020; one day after the WHO (2020) officially announced the COVID-19 pandemic. Ibovespa dropped to its lowest scores since 2017 (63.570 ppt), as shown in Figure 1 (Elias, 2021).

During the market crash period, governments, central banks, and authorities worldwide have started an unprecedented policy intervention to offset possible adverse effects in the economy and market fears (Deev & Plíhal, 2022). In Brazil, B3 interrupted the trading sessions six times using the Circuit Breaker mechanism (B3, 2020). The Circuit Breaker was created in 1997, made to interrupt the trading session for 30 minutes when the stock market drops more than 10%. After reopening, it is activated again for an hour if the fall exceeds 15% (Jones, Brown, & Palumbo, 2020).

From the worst day in March until the end of 2020, Ibovespa recovered and increased, closing at 119.238 ppt. The IBOV evaluation during 2020 is presented in Figure 1.

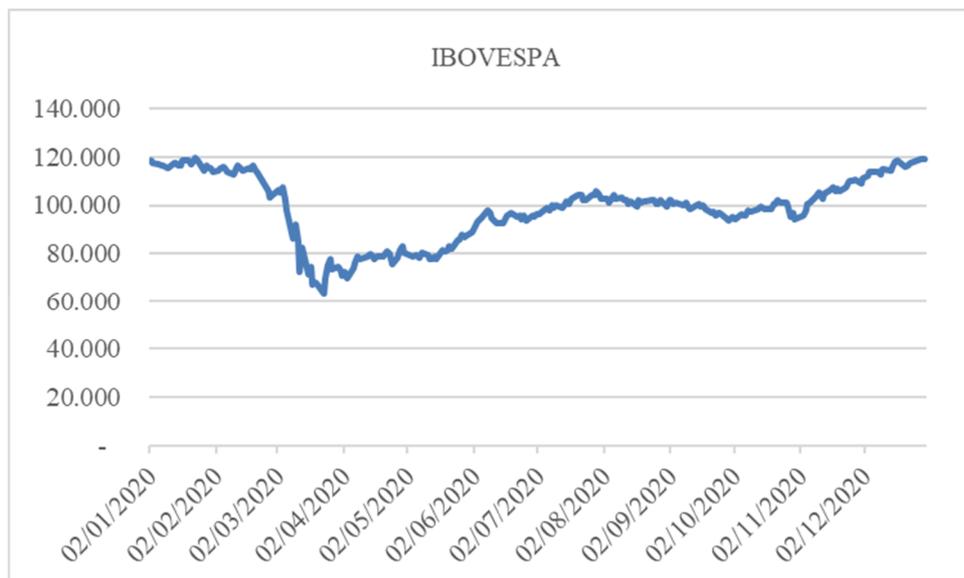


Figure 1. IBOV 2020 evaluation in Brazilian Reais (R\$)

Source: Based on Economatica data

Considering that the Brazilian financial market faced an unprecedented scenario combined with the high volatility of stock prices caused by the uncertainties of the crisis, the following question arises: did ESG immunize stocks in Brazilian companies listed in the index portfolio (ISE B3) during the COVID-19 crisis?

1.2 Objectives

The core of this research is Demers et al. (2021), whose study sheds light on the debate over whether ESG performance was a stock price resilience factor during the COVID-19 pandemic market crash. The reason for choosing this study is related to the findings robustly contradicting the importance of ESG in explaining stock returns during the COVID-19 pandemic market crash, and also the suggested inconsistency in viewing ESG as a resilience

factor across periods of crises, since companies with higher ESG scores tend to have better risk management practices in place. That includes preparedness for unforeseen events like the pandemic. These companies are often better equipped to face systematic risks and disruptions, which can help maintain investor confidence and stabilize stock prices (Albuquerque et al., 2020).

In this way, the general objective is to analyze if ESG scores were a determinant factor for stock price protection during the market crash period in 2020 due to the COVID-19 pandemic (March 2020) and the full year of 2020, comparing companies listed in the index portfolio (ISE B3) with the ones that are not listed.

Based on these data, the specific objectives were:

a) to analyze abnormal stock returns when market returns were significantly negative and referred to as the “crisis” period during March 2020 and the full year of 2020.

b) to examine the relation among ESG scores, abnormal returns, and financial performance during March 2020 and the full year of 2020.

c) to identify if the company listed in the index portfolio (ISE B3) got a better driver of the COVID-19 pandemic period returns compared to companies that are not listed.

1.3 Justifications and contributions

The analysis on whether ESG is an essential determinant for stock price returns during the COVID-19 pandemic and the portfolios composed by ESG scores, such as the ISE B3's, is a insufficiently studied topic in Brazil. This dissertation's findings will provide an opportunity to complement and offer a comparative basis with previous research.

Authors who investigated ESG performance worldwide have presented opposite results when comparing ESG performance with stock price returns, as it will be presented in Chapter 2.3. For example, Albuquerque et al. (2020) and Ding, Levine, Lin and Xie (2021) analyzed the COVID-19 pandemic in 2020 and found benefits in owning assets related to a social commitment. However, some studies show the opposite results, such as Białkowski and Sławik (2022), Cardillo, Bendinelli and Torluccio (2022) and Demers et al. (2021).

Due to the diverse and contradictory findings of previous studies, this research aims to contribute to the literature on the analysis of ESG scores as a factor of stock price protection during the 2020 COVID-19 pandemic crisis in the Brazilian market. Also, the empirical results of this study may assist investors in their decision-making process during economic crisis.

1.4 Delimitations

The delimitations are related to the field of study, which is only the country of Brazil, and the sample is composed by companies whose ESG scores data are available at Refinitiv Eikon®, not extending to the companies' sustainable disclosures.

1.5 Research Structure

This study is divided into five chapters: Introduction, Literature Review, Methodology, Results, and Analyzes, and Conclusion. The introductory chapter contextualizes the COVID-19 pandemic in Brazil and around the world from a social, economic, and financial perspective, the problematization and objectives, the justifications and finally, the delimitations of the study.

The second chapter presents the theoretical framework and recent studies on this subject. The third part describes the method: the study of events and the proposed regression model. It introduces the model, the hypotheses, and provides the necessary definitions. Results are presented next, and the analyzes carried out is focused on the particularities of each period (March 2020 and the full year of 2020).

Finally, the study was concluded by reintroducing the research problem and a summary of the main findings. In addition, it presents the implications for the academy, investors, limitations and further studies.

2 Literature Review

This chapter comprises the recent theoretical framework that supports the research problem and hypotheses’ formulation. Three main subjects are presented: ESG measurement concepts and indexes, the literature on the motivations that influence the performance of companies, and previous research about ESG performance during the COVID-19 pandemic.

2.1 ESG concept and the ESG indexes

The term ESG was first mentioned in 2004 in a United Nations Global Compact publication in partnership with the World Bank called “Who Cares Wins”, but the discussions of those concepts began at least four decades ago (Câmara & Morais, 2022, p. 5).

ESG is a framework or a set of standards for a company’s behavior that investors use to evaluate the sustainability and ethical impact of companies and their operations. ESG scores consider the impact of a company’s activities on the environment, its social impact on employees, customers and communities, and the effectiveness of its governance structure and policies. It also proposes a redefinition of the value creation measure. “In other words, there is a broader matrix to analyze the value and economic growth metrics” (Câmara & Morais, 2022, p. 12).

Table 1 summarizes the three pillars of ESG based on the OECD 2015 Framework.

Table 1
Pillars of ESG

Pillars of ESG		
Environmental	Social	Governance
It considers a company’s environmental impact, including its carbon footprint, waste management, and resource conservation practices. It also encompasses climate change, biodiversity, and risks (OECD, 2015).	It evaluates a company’s impact on society, its relationships with employees, customers, suppliers, and communities. Social factors also encompass human rights, diversity and inclusion, labor standards, consumer protection, and product safety (OECD, 2015).	It focuses on a company’s internal systems and processes, its leadership structure, board composition, executive compensation, and shareholder rights. It also involves corporate transparency, accountability, and ethics (OECD, 2015).

Note. Source: Based on OECD (2015) Framework

Since the beginning of the 1970s, more than 2,000 empirical studies on the relationship between ESG and economic and financial performance were published. Around 90% of the studies’ results showed a nonnegative relation, most of them reporting positive findings (Friede, Busch, & Bassen, 2015; Garcia, Mendes-da-Silva, & Orsato, 2017).

The general interest of asset investors has increased for ESG investing. For example, “in 2019, the capitalization of ESG focused portfolios in major markets exceeded US\$30 trillion” (Broadstock, Chan, Cheng, & Wang, 2021, p. 1). Investors find ESG investing significant for at least of two reasons: initially, it actively advances ethical investment practices, and additionally, ESG investing is progressively perceived as a means of improving managed portfolio performance, thereby raising returns and decreasing portfolio risk. On the contrary, Tanna, Conti and Silva (2021, p. 6) defends that corporate ethics “is a reflection of dominant organizational norms and values” and those are important factors to bring good results mainly during a period of crisis.

According to Berg, Fabisik and Sautner (2020), a key challenge for researchers and investors in measuring a firm’s “ESG quality” is appropriately quantifying its performance concerning ESG criteria. The majority of empirical ESG studies have relied on ESG scores formulated by data providers, which evaluate a company’s performance across different ESG areas.

The ESG scores cover a range of issues related to company activities that include the following categories: (i) Environment, which relates to resource use, emissions, and innovation; (ii) Social, which concerns relations with the workforce, human rights, community, and product responsibility; (iii) Governance, which focuses on issues related to management, shareholders and ESG strategy (Peng & Isa, 2020). Those definitions generally involve civic engagement actions, shared beliefs, and the relationship between the company and its stakeholders (Lins, Servaes, & Tamayo, 2017).

On the other hand, ESG indexes are portfolios of companies constructed by index providers to meet specific ESG criteria. The purpose of ESG indexes is to provide investors with a way to invest in companies that meet specific ESG standards while also giving broad market exposure (Albuquerque et al., 2020).

In summary, ESG scores are ratings assigned to companies based on the ESG companies’ performances, while ESG indexes are portfolios of companies that meet specific ESG criteria. Companies compare ESG performances using ESG scores. The ESG indexes as a portfolio of investment compare companies that meet specific ESG standards.

Several sustainable indexes in Brazil aim to measure the ESG performance of companies listed on B3: ISE, ICO2, S&P/B3 Brasil ESG, Corporate Sustainability Index (ISEB), and CDP Index. The main Sustainability Index in Brazil is the ISE (*Índice de Sustentabilidade Empresarial*), or “Corporate Sustainability Index” in English. In 2005, B3

created the ISE B3 portfolio, which aims to identify companies that demonstrate a high commitment to sustainability and social responsibility practices (B3, 2020).

ISE comprises a select group (portfolio) of companies listed on B3 that meet strict criteria related to ESG factors. This portfolio of ISE B3 is the result of a theoretical assets' portfolio prepared as per the criteria established by B3, adopting concepts and practices outlined in the Concepts and Practices Manual for B3 Indexes (B3, 2020). The Financial Market recognizes the companies listed in the ISE B3 portfolio as leaders in sustainability practices in Brazil with a high commitment to sustainable development. The ISE is an essential tool for investors looking to provide capital for companies that are committed to sustainable and responsible practices and want to align their investments with their values (B3, 2020).

Tietz (2022) presented a result that companies listed in the ISE B3 presented similar financial performance or better to the B3 group and consequently revealed to have lower or similar economic-financial risk.

In this study, the ESG scores were obtained from Thomson Reuters ESG Scores, since it offers one of the most comprehensive ESG databases, covering over 6,000 public companies across more than 400 different ESG metrics. Thomson Reuters ESG Scores are available on the Refinitiv Eikon® database. Table 2 presents the ESG Scores Range:

Table 2
Thomson Reuters ESG Scores

Score Range	Grade
0.0 <= score <= 0.083333	D-
0.083333 < score <= 0.166666	D
0.166666 < score <= 0.250000	D+
0.250000 < score <= 0.333333	C-
0.416666 < score <= 0.500000	C
0.500000 < score <= 0.583333	B-
0.583333 < score <= 0.666666	B
0.750000 < score <= 0.833333	A-
0.833333 < score <= 0.916666	A
0.916666 < score <= 1	A+

Note. Source: Based on Thomson Reuters

Investors use ESG scores to assess the risks and opportunities associated with sustainability and ethical practices when investing in a particular company. Also, by prioritizing ESG assumptions, companies can demonstrate their commitment to stakeholders beyond maximizing shareholder value.

2.2 Stakeholder theory

Stakeholder Theory is a “framework” that means a set of ideas from which derived several theories (Freeman, Harrison, Wicks, Parmar, Colle, & Purnell, 2010). It was developed based on the “business world,” considering every kind of business created and sometimes destroyed as an opportunity of value creation for customers, suppliers, employees, communities, and financiers (Freeman, Phillips, & Sisodia, 2020). It relates to the concepts of ESG in the sense that both are concerned with the long-term sustainability of a company, due to the commitment of businesses to maximize the economic benefits of shareholders. By considering the interests of all stakeholders and managing its impact on the environment and society, a company can create long-term value for all stakeholders, including shareholders (Peng & Isa, 2020).

The Stakeholder Theory argues that organizations should not focus solely on maximizing shareholder value, but consider all stakeholders’ needs and interests, including that the organization operates ethically and responsibly and that its actions have positive social and environmental impacts. Firms with good ESG practices increase performance, which is consistent with the stakeholder theory based on good management practices (Peng & Isa, 2020; Saini, Aggarwal, Dhingra, Kumar, & Yadav, 2023). As companies increasingly recognize the importance of stakeholder theory and ESG, they will likely adopt more responsible business practices that benefit all stakeholders.

ESG indicators are one of the possible ways to measure companies’ impacts and value creation with their stakeholders. Through the creation of indicators, it is possible to measure performance in ESG and make comparisons of its performance among companies in the same sector, identifying the motivating factors for changes and investments in the socio-environmental area (Orsato, Garcia, Mendes-da-Silva, Simonetti, & Monzoni, 2015).

Based on the stakeholder theory, ESG activities are transferable or synergized into a firm’s market performance. As an example, “satisfied and happy employees will be more motivated in their jobs; satisfied customers will foster loyalty, satisfied suppliers will provide discounts, and so forth, which, in turn, enhances a firm’s reputation, and leads to better financial performance and sustainability” (Peng & Isa, 2020, p. 7). These ESG activities must be appropriately reported and disclosed, providing the stakeholders with the quality and accuracy of the Financial Statement Reports to achieve accountability to different stakeholders (Reis, Cintra, Ribeiro, & Dibbern, 2015).

ESG is a practical application of stakeholder theory, as it involves considering the interests of a company's various stakeholders when evaluating its sustainability and ethical practices, and by prioritizing ESG factors as a part of their purpose of existence and, therefore, for long-term shareholder value creation (Zumente & Bistrova, 2021).

Mather (2020) argues that, during a crisis, the need for resilience, clarity of decision-making, empathy and displaying bounded optimism are all vital leadership traits. Excellent and clear communication is critical as "direction-giving," "meaning-making," and "empathy" are the three key elements that leaders must address to motivate and obtain optimum results from stakeholders. Also, Demers et al. (2021) emphasize the notion that ESG activities will contribute to stock price resilience during periods of crisis and the belief that these activities help build social capital and trust in the corporation and will therefore motivate the company's stakeholders to remain loyal, assisting the company in results during the crisis period.

Ng, Alonso, Bressan, Vu, Tran and Atay (2022) found that while survival during the COVID-19 pandemic is seemed to be the most important for the companies' employees, shareholders also perceived domino effects on clients and suppliers, generating collaboration with industry and stronger bonds with business partners, besides closer relationships with employees, including having a clear goal, a cohesive staff team, and management support.

Finally, Peng and Isa (2020) argue that the stakeholder theory states that the better a firm manages relationships with all stakeholders, the more successful it will be. They also add that ESG can solve conflicts between managers and stakeholders as ESG engagement positively affects firm performance, implying that active ESG initiatives' policies protect the bottom line and increase shareholder value (Peng & Isa, 2020).

2.3 Previous studies

This part presents studies focused on analyzing how the COVID-19 pandemic and ESG correlate from various angles to answer the research question. The studies cited below are all recent, having been published since 2020.

Some studies have indicated a positive correlation between ESG performance and cumulative abnormal returns during the COVID-19 pandemic. This implies that companies with higher ESG scores demonstrated stronger performance throughout the crisis period. However, other studies found no statistically significant relationship between ESG performance and stock prices' abnormal returns during the same period.

Table 3 summarizes the findings of those studies. In the column "Findings," the Positive result means that the finding presented in the study corroborates with the research of Demers et

al. (2021); the Negative result means that it does not. There are nine Positives results, and eight Negative results.

The Positive results that corroborate with Demers et al. (2021) are studies carried out in different markets, countries, and through different statistical methodologies, but obtained similar results, for example:

Abedifar, Bouslah, Neumann and Tarazi (2022) examined Japanese and U. K. stock prices with a high Environmental and Social (E.S.) ranking, and the findings show that, in terms of returns, they suffered more during and after the COVID-19 pandemic market crash, while the firms from U.S. and Canada did not have significant differences in stock price behavior based on E.S. ratings. Their findings suggest that engaging with E.S. activities is not associated with better or worse performance during crises.

Regarding the relationship between financial performance and ESG, Bodhanwala and Bodhanwala (2023) results provide robust evidence that no significant difference in stock market performance indicators between high and low ESG-compliant firms was observed during the crisis period of the 1Q and for the further full year of 2020. On the contrary, the study found that dividend yield was statistically significant in determining the stock market performance of Indian firms during the crisis period and argues that investors would be more concerned with business continuity, cash flows and profitability than business sustainability.

In other studies, about financial performance, Cardillo et al. (2022) found that firms with higher ESG scores perform better than others when they had higher cash holdings and liquid assets necessary to absorb the pandemic issues. It means that ESG does not ensure resilience and competitive advantage if not combined with sound financial fundamentals, such as a flexible financial structure, while Huang and Ye (2021) found that U.S. public firms with excessive debt beyond optimal levels showed high firm risk during the COVID-19 pandemic. The effect is stronger in firms with poor ESG practices, while firms with debt below the optimum level are self-protected regardless of their ESG practices. At the same time, Mukanjari and Sterner (p. 825, 2020) found that “having an official ESG climate change policy has no effect on firm performance during the pandemic.”

To analyze the impact of the policies’ announcements and their effects on stock prices, Chiappini, Vento and Palma (2021) examined, through an event study, the relationship between ESG scores and financial performance during the market crash of the COVID-19 pandemic. The results indicated that higher sustainability performance levels did not protect investments from losses, while the study of Naffa and Dudás (2023) suggested that firms with better ESG management were less resilient to crisis due to investor perception of corporate management

quality. During market distress, investors seek to liquidate positions of higher-quality stocks. Low-quality stocks would have thinner order books, lower liquidity, and wider bid-ask spreads. Hence, the traded quality stocks in a sell-off register a higher drawdown.

Negatively compared to the results of Albuquerque et al. (2020), Demers et al. (2021) found that stocks with higher ESG ratings in the USA have significantly higher returns. Consequently, the lower return volatility during the market crash in 2020 has also emphasized the importance of customer and investor loyalty to ESG stocks in the same period. However, Demers et al. (2021) explain that this different result among similar studies occurred due to the inclusion of several additional market-based, accounting-based, and other-based control variables in their research.

Ferriani and Natoli (p. 7, 2021) presented an analysis based on equity mutual funds with ESG as a risk component. They confirmed the perception of sustainability as a valuable hedge in bad times. Within their sample, “discriminating funds based on ESG risk happened to be a wise strategy because low-ESG risk funds performed better than their peers did.”

Corroborating with the same rationale, Ding et al. (2021) found that the firm with more robust ESG policies and activities before the pandemic presented superior stock price performance during the COVID-19 period. These findings validate the perspective that ESG builds trust with stakeholders and supports the business in times of crisis.

Nader, El-Khalil, Nassar and Hong (2022, p. 1) presented that prudent firms implemented “triple sustainability practices—economic improvement practices, socially responsible practices, and environmental practices—to ensure their market competitiveness and corporate reputation during critical times” in their empirical study, while Ramesh and Athira (2022) affirmed that the positive effect of ESG on firm performance is more pronounced in countries with better governance. Among non-International Financial Reporting Standards adopters, when trust in firms and markets falls during an economic crisis, the trust established between a firm and its stakeholders via socially responsible behavior pays off.

Mather (2020) argues that a crisis of this magnitude will change the post-crisis economic scenario or “next normal.” The outcome of an organization’s survival influences its governance and leadership responses.

Finally, Demers et al. (2021) performed regress buy-and-hold abnormal returns on the USA firms’ (S&P 500 index) and concluded that even if ESG scores have been widely touted as indicators of share price resilience during the COVID-19 pandemic crisis, it offers no positive explanatory power for returns in the course of the aforementioned crisis in the year 2020. However, investments in intangible assets were positive.

Table 3
Previous Research

Author and Year of Publication	Title	Sample and Field of Study	Findings – Positive or Negative?
1. Abedifar et al. (2022)	The Resilience of Environmental and Social Stocks under Stress: Lessons from the COVID-19 Pandemic	330 firms in Canada, France, Japan, the U.K., and the U.S.	Positive
2. Albuquerque et al. (2020)	The Resiliency of Environmental and Social Stocks: An Analysis of the Exogenous COVID-19 Market Crash	2,171 U.S. firms.	Negative
3. Bae et al. (2021)	Does CSR matter in times of crisis? Evidence from the COVID-19 pandemic	1,750 U.S. firms	Positive
4. Bodhanwala and Bodhanwala (2023)	Environmental, social and Governance Performance: Influence on market value in the COVID-19 pandemic crisis	70 Indian firms.	Positive
5. Cardillo et al. (2022)	COVID-19, ESG investing, and the resilience of more sustainable stocks: Evidence from European firms	1,204 firms in Europe	Positive
6. Chiappini et al. (2021)	The Impact of COVID-19 Lockdowns on Sustainable Indexes	Sustainable indexes from Europe and the U.S.	Positive
7. Ding, Levine, Lin, and Xie (2021)	Corporate Immunity to the COVID-19 Pandemic	6,700 firms across 61 countries	Negative
8. Dudás and Naffa (2023)	Does ESG Improve Crisis Resilience? Empirical Evidence of Global Emerging Equity Markets during the Covid-19 Crisis	1,031 global emerging market (GEM) equities	Positive
9. Engelhardt, Ekkenga, and Posch (2021)	Does ESG Improve Crisis Resilience? Empirical Evidence of Global Emerging Equity Markets during the Covid-19 Crisis	1,452 firms from 16 different European countries	Negative
10. Ferriani and Natolli (2021)	ESG risks in times of Covid-19	U.S. Funds	Negative
11. Garcia, (2021)	The resilience of Brazilian companies with the best ESG performance: an analysis during the Covid-19 crisis.	159 firms from B3 in Brazil	Negative

To be continued

Author and Year of Publication	Title	Sample and Field of Study	Conclusion Findings
12. Huang and Ye (2021)	Rethinking capital structure decision and corporate social responsibility in response to COVID-19.	U.S. firms	Positive
13. Lu and Khan (2023)	Are sustainable firms more profitable during COVID-19? Recent global evidence of firms in developed and emerging economies.	48,867 observations (6,994 unique firms) from 34 countries.	Negative
14. Mukanjari and Sterner (2020)	Charting a “Green Path” for Recovery from COVID-19.	Europe (STOXX 600 index)	Positive
15. Mello (2022)	Performance of ESG portfolios at B3: influence of uncertainty in times of crisis and COVID-19	Sixteen (16) portfolios of indexes. The period of analysis was from 2005 to 2021	Positive
16. Ramesh and Athira (2022)	Real Effects of social trust on firm performance during COVID-19	80,454 firms across 51 countries	Negative
17. Tietz (2022)	Analysis of the economic-financial risk indicators of the Companies with the ESG seal: Comparison between the companies that make up the ISE and those listed on the BM&FBOVESPA.	298 companies listed on B3 for the period from 2017 to 2020 to obtain comparable data with those registered in the ISE concerning those in the B3.	Negative

2.4 Hypotheses

After building the theoretical basis of this study, a positive correlation between ESG performance on stock prices and cumulative abnormal returns was identified, implying that companies with higher ESG scores tend to fare better during a crisis period. However, contrasting findings have also emerged.

Since this study is based on Demers et al. (2021), the hypotheses are formulated to capture if ESG scores were a factor of stock price protection during the COVID-19 pandemic in Brazilian public companies listed in the index portfolio ISE B3, more specifically during the year 2020:

2. H1: ESG score protected the stock prices of the Brazilian public companies listed in the index portfolio - ISE B3 during the period of market crash (March 2020), compared to companies that were not listed.

Following the studies of Abedifar et al. (2022), Albuquerque et al. (2020) and Ding et al. (2021) and which resulted in statistically and economically significant regressions of the scores Environment, Social, and Governance individually, the research proposed the hypotheses below for the market crash period:

- a) H1 (a) ENV scores protected the stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the market crash, compared to companies that were not listed.
- b) H1 (b) SOC scores protected the stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the market crash, compared to companies that were not listed.
- c) H1 (c) GOV scores protected the stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the market crash, compared to companies that were not listed.

To better capture the effects of volatility in the Brazilian financial market during the COVID-19 pandemic crisis period, this research examined the relation between ESG scores and, alternatively, abnormal returns for the entire year of 2020, comparing the results with Demers et al. (2021) and Garcia (2022):

3. H2: ESG score protected the stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the full year of 2020, compared to companies that were not listed.

Following the studies of Abedifar et al. (2022), Albuquerque et al. (2020) and Ding et al. (2021), which resulted in statistically and economically significant regressions of the scores Environment, Social, and Governance individually, the research proposed the hypothesis below for the full year of 2020:

- a) H2 (a): ENV scores protected stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the full year of 2020, compared to companies that were not listed.
- b) H2 (b): SOC scores protected stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the full year of 2020, compared to companies that were not listed.
- c) H2 (c): GOV scores protected stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the full year of 2020, compared to companies that were not listed.

3 Methodology

The event study methodology was used to capture the effects of volatility in the Brazilian financial market during market crash periods. The hypotheses' tests used regression with ordinary least squares (OLS data). This session explains each of the models and their adequacy.

Campbell, Lo and MacKinlay (1997, p. 151) presented six steps for the Event Study execution during research shown in Figure 2: (i) the first step in the study of events is to establish the event of interest for the research and identify the period when an event window accompanies the companies' stock price. In addition, there is a window estimation, the period before the event, and the post-event window; (ii) the second is to determine the criteria for selecting the companies that participated in the study; (iii) the third is the measurement of abnormal returns; (iv) the fourth is the definition of the procedures of the event window estimation; (v) the fifth is the testing procedure; (vi) the sixth is the presentation of the empirical results follow the formulation of the econometric design and; (vii) finally, the interpretation and conclusion. The details of each step of this study are detailed in the following chapters.

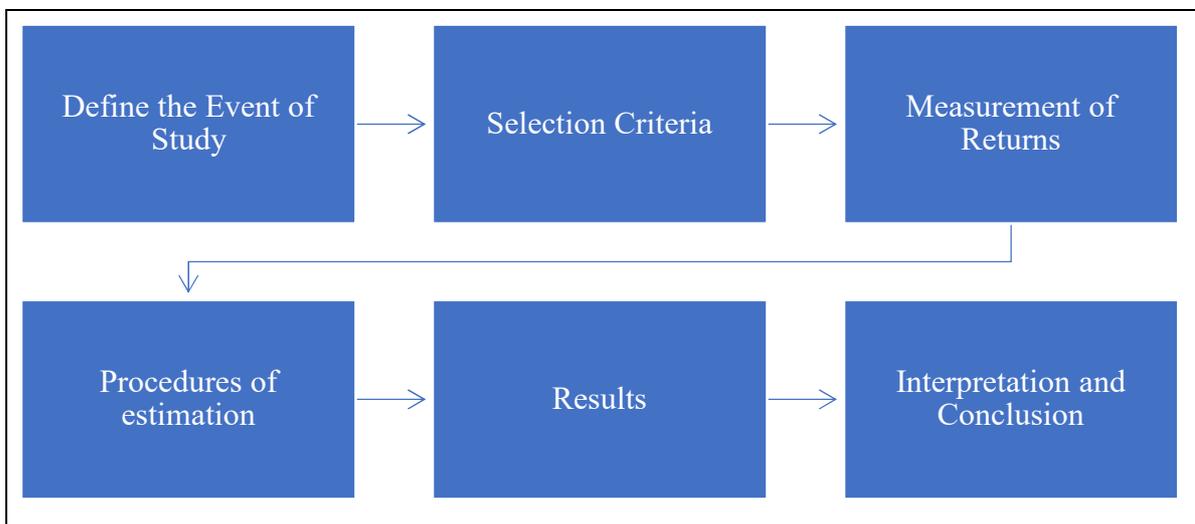


Figure 2. Steps for the Event of Study

Source: Campbell, Lo, and MacKinlay (1997), pp. 151-152.

3.1 Event study timeline

Figure 3 presents the Event Study Timeline, which shows the estimation windows from March 19th, 2020, to March 23rd, 2020 (market crash), and from December 28th, 2020, to December 30th, 2020 (full year). A standard pre-event window period of 252 days was used before the market crash events.

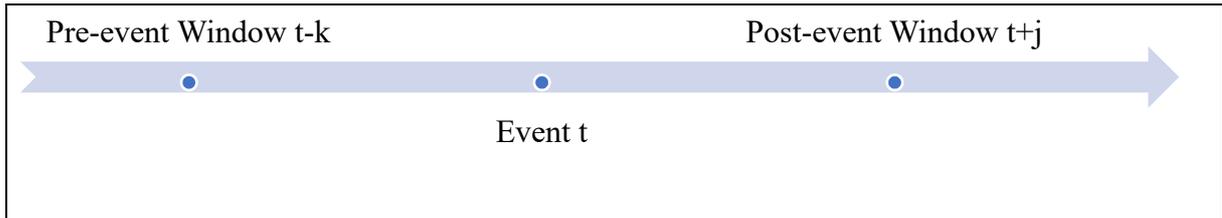


Figure 3. The Event Study Timeline

3.2 Field of study and sample

The field of this study was the Brazilian stock exchange (B3), and the sample is composed by the companies with ESG Scores during the year 2020 and those listed in the ISE B3 portfolio of the same year.

The Refinitiv Eikon® Platform (Plataforma Refinitiv Eikon®) database was the basis of the companies' data collection for this study in Brazil. The initial list had 390 companies listed on B3. The first assumption was to consider companies with ESG scores, and the ones listed in the ISE B3 portfolio. Due to the lack of financial information available at Refinitiv, the final sample is composed by 112 companies, and 29 companies listed in the B3 index portfolio for the year 2020 as presented in Table 4.

Table 4

Sample Definition

Companies listed on B3	2020
Total of the Sample	390
Total of Companies with ESG Scores	120
Total of Companies listed in the ISE B3 portfolio	30
Final sample (due to lack of information)	112

Table 5
Sample by economic sector – 2020

SIC	Sector	N	%	ISE B3	%
01 – 09	Agriculture, Forestry, and Fishing	1	1%		
10 – 14	Mining	3	6%		
15 – 17	Construction	7	17%	1	3%
20 – 39	Manufacturing	26	20%	6	21%
40 – 49	Energy & Transportation	18	23%	8	28%
50 – 51	Wholesale	2	3%		
52 – 59	Retail	10	9%	2	7%
60 – 67	Finance Services & Real Estate	23	17%	6	21%
70 – 89	Services	22	20%	6	21%
	Total	112	100%	29	100%

The segregation of the sample by economic sector is presented in Table 5. The goal is to analyze if companies with greater ESG engagement suffer less during the crisis period when compared to other companies in the same sector.

The column “ISE B3” presents the companies listed in the ISE B3 portfolio during the Year of 2020 by economic sector.

3.3 Variables studied and data analysis

First, using the Microsoft Excel® software, the abnormal return (CAAR) was calculated to start analyzing the impact of the event study, designated as the *ex-post* return for the event window minus the average return of the company, which consists of the expected return without considering the event.

$$AR_{it} = R_{it} - E(R)_{it}$$

Where:

AR_{it} = abnormal return of each stock price (i) in the determined time (t);

R = real return;

E = expected return.

The companies’ stock price data were collected through the Economática® Daily, considering the latest information available before the event date. The calculation of the market

model is the multiplication of the beta of each company by the daily market return (Ibovespa) to get the expected daily return.

The β or beta is the cumulative average abnormal return (CAAR) for January through March 2020 (Q1), and the entire year of 2020. This β (Daily Abnormal Return) is the slope parameter, calculated by subtracting the real daily return for the period. In the expected daily theoretical return, y is the dependent variable, and ε is the error term (or disturbance).

The Gretl® software runs variants using regression models with an estimation of the coefficients – Ordinary Least Squares (OLS) – to investigate the relation between ESG Scores and the stock prices' abnormal returns during the Q1 of 2020, and also the crisis period during the full year of 2020.

Ordinary Least Squares is a method used in linear regression analysis to estimate the unknown parameters of a linear regression model. The goal of OLS is to minimize the sum of the squared differences between the observed values and the predicted values of the Response variable. The OLS estimator is consistent when the regressors are exogenous; and there is no multicollinearity and optimal in the class of linear unbiased estimators when the errors are homoscedastic and serially uncorrelated. Under these conditions, the method of OLS provides minimum-variance mean-unbiased estimation when the errors have finite variances. These properties make OLS a widely used method for estimating the parameters of linear regression models (Wooldridge, 2014, p. 60).

The dependent variable (CAAR) had ESG's (ESG, ENV, SOC and GOV) performance as proxies, with one of the explanatory variables being the financial performance proxy. A Dummy variable was created with a value of 1 for companies listed on ISE B3 or 0 for companies not listed at ISE B3.

Following Demers et al. (2021), the company's liquidity and leverage assessment is demonstrated through the variables of Cash, Long-Term Debt, Short-Term Debt, the financial performance through the ROA and, respectively, the loss indicator variable (Operating Income) and those are the accounting-based measures. The ROA is the most popular finance variable used in the research and it is calculated based on the Net Income / Total Assets. The Return on Assets shows the ability of the company to generate net income based on its assets.

As observed in the Market Capitalization variable, Garcia et al. (2017) found a positive relationship between social and environmental indicators and the firm's value. This variable is widely used as a proxy for company size.

Albuquerque et al. (2020) and Engelhardt, Ekkenga and Posch (2021) used the variables of profitability, cash holdings and debts, justifying that during the COVID-19 crisis period, firms with favorable financial indicators may have higher stock returns.

Table 6 summarizes the variable's definitions and some of their theoretical sources.

The Log transformation is used to get the data's symmetry and reduce the outliers for the variables: CASH, MKTC, OPEINC, STDEBT, and LTDEBT.

Table 6
Variable definitions and sources

Variable Code	Variable Description	Theoretical Sources
ESG	Environment, Social & Governance – Measure from 0 to 100%. ESG grouped the bases of governance, environmental and social pillars compiled by Refinitiv. It reflects the average performance of a company in these three areas.	Alburquerque et al. (2020); Demers et al. (2021); Ding et al. (2021); Engelhardt, Ekkenga and Posch (2021); Garcia et al. (2017).
ENV	Environment – Varies from 0 to 100%. ENV measures the impact of a company on natural systems, including air, soil and water, as well as on natural ecosystems.	Alburquerque et al. (2020); Demers et al. (2021); Ding et al. (2021); Engelhardt, Ekkenga and Posch (2021); Garcia et al. (2017).
SOC	Social – Measure that varies from 0 to 100%. Using better management practices, S.S. measures the company's capacity to generate trust and loyalty in its workers, customers, and society.	Alburquerque et al. (2020); Demers et al. (2021); Ding et al. (2021); Engelhardt, Ekkenga and Posch (2021); Garcia et al. (2017).
GOV	Governance – Measure that varies from 0 to 100%. GOV measures the systems and processes of a company, which guarantee that its board members and executives act in the best interests of their shareholders, with a long-term view of the operations.	Alburquerque et al. (2020); Demers et al. (2021); Ding et al. (2021); Engelhardt, Ekkenga and Posch (2021); Garcia et al. (2017).
ISEd	Dummy Variable – if the company is listed at ISE B3, the value is 1; if not, the value is 0.	N/A
CASH	Cash represents Cash & Due from Banks for Banks, Cash for Insurance companies, and Cash & Short-Term Investments for all other industries.	Alburquerque et al. (2020); Demers et al. (2021); Ding et al. (2021); Engelhardt, Ekkenga and Posch (2021).
MKTC	Market Capitalization – Market Price-Year End * Common Shares Outstanding. For non-U.S. corporations, this item represents the closing price of the company's stock at their fiscal year-end.	Garcia et al. (2017).

To be continued

Conclusion

Variable Code	Variable Description	Theoretical Sources
ROA	Return on Assets – Calculated by dividing the net result by the total Assets.	Albuquerque et al. (2020); Bodhanwala and Bodhanwala (2023); Demers et al. (2021); Ding et al. (2021); Garcia (2017); Garcia (2022).
OPEINC	OPERATING INCOME represents the difference between sales and total operating expenses.	Albuquerque et al. (2020); Demers et al. (2021); Engelhardt, Ekkenga and Posch (2021).
STDEBT	Short-Term Debt – represents that portion of debt payable within one year.	Bae et al. (2021); Demers et al. (2021); Engelhardt, Ekkenga and Posch (2021).
LTDEBT	Long-Term Debt – represents that portion of debt payable over a year.	Bae et al. (2021); Demers et al. (2021); Engelhardt, Ekkenga Posch (2021).
DIVP	The dividend payout ratio is the dividends / net income.	Albuquerque et al. (2020); Bodhanwal and Bodhanwala (2023); Demers et al. (2021).

For this study, the four following regressions were:

$$\beta (CAAR) = y_0 + y_1ESG + y_2Cash + y_3OPEINC + y_4MKTC + y_5ROA + y_6STDebt + y_7LTDebt + y_8DivP + y_9ISEd + \varepsilon (1) \quad (1)$$

$$\beta (CAAR) = y_0 + y_1ENV + y_2Cash + y_3OPEINC + y_4MKTC + y_5ROA + y_6STDebt + y_7LTDebt + y_8DivP + y_9ISEd + \varepsilon (1) \quad (2)$$

$$\beta (CAAR) = y_0 + y_1SOC + y_2Cash + y_3OPEINC + y_4MKTC + y_5ROA + y_6STDebt + y_7LTDebt + y_8DivP + y_9ISEd + \varepsilon (1) \quad (3)$$

$$\beta (CAAR) = y_0 + y_1GOV + y_2Cash + y_3OPEINC + y_4MKTC + y_5ROA + y_6STDebt + y_7LTDebt + y_8DivP + y_9ISEd + \varepsilon (1) \quad (4)$$

Where:

β CAAR = Abnormal returns for 1st Q 2020 and Full Year of 2020: Dependent Variable

ESG = Environment, Social, and Governance Score

ENV = Environment score

SOC = Social Score

GOV = Governance Score

Cash = Total Cash reported

OperINC = Operating Income

MKTC = Market Capitalization

ROA = Return On Assets

STDebt = Short-Term Debt

LTDebt = Long-Term Debt

Divp = Dividend Payout

ISEd = Dummy ISE B3

ε = random error component

4 Results

This chapter presents the results obtained by applying techniques and statistic methods mentioned in the previous chapter. Including: (i) descriptive analyzes, (ii) correlation analysis between variables; (iii) and the result of the regression models with an estimation of the coefficients (Ordinary Least Squares).

4.1 Descriptive statistics

This section presents statistical data, such as the average, standard deviation, maximum and minimum value, and correlations for the variables of the study.

Table 7 presents the descriptive statistics for ESG, ENV, SOC, and GOV average scores by SIC for March 2020. The data for this calculation was the entire year reported by Refinitiv Eikon® in 2019: the Sector of Manufacturing presented the highest average for ESG scores, followed by Energy & Transporting, while Wholesale had the best Score for Environment. On the other hand, Mining had the lowest averages for this score.

Table 7
Average ESG Scores by SIC – Period 1 – March 2020

Sector	N	ESG	ENV	SOC	GOV
Agriculture, Forestry, and Fishing	1	0	0	0	0
Mining	3	43.96	37.89	43.62	53.25
Construction	7	40.66	30.87	46.52	45.95
Manufacturing	26	55.69	54.73	55.25	59.18
Energy & Transportation	18	53.53	51.43	57.86	50.70
Wholesale	2	50.98	77.30	48.63	26.11
Retail	10	51.70	52.33	53.07	49.27
Finance Services & Real Estate	23	44.80	33.65	51.46	42.54
Services	22	49.93	42.22	50.78	55.30
Total	112	50.19	45.16	52.99	51.06

In Table 8, the descriptive statistics presented for ESG, ENV, SOC and GOV average scores by SIC the data related for the entire year of 2020 where the sector of Energy & Transportation presented the highest average for those scores, followed by Manufacturing, while Agriculture and Wholesale had the lowest average.

Table 8
Average ESG Scores by SIC – Period 2 – Full Year of 2020

Sector	N	ESG	ENV	SOC	GOV
Agriculture, Forestry, and Fishing	1	26.40	42.49	19.70	20.62
Mining	3	44.33	40.05	41.84	54.53
Construction	7	30.51	20.72	30.71	41.22
Manufacturing	26	53.07	50.86	53.24	56.20
Energy & Transportation	18	58.49	56.97	61.90	56.26
Wholesale	2	29.25	32.49	30.15	24.13
Retail	10	39.93	38.90	38.43	42.74
Finance Services & Real Estate	23	45.98	35.81	50.72	45.68
Services	22	49.93	40.61	54.47	52.41
Total	112	48.50	43.28	50.71	50.33

Table 9 presents the observations of descriptive statistics for the variables of ESG Scores. Also, the economic and financial performance variables for March 2020 and Table 10 present the observations for the entire year of 2020. The data used for this calculation was the entire year reported by Refinitiv Eikon® in 2019.

Table 9
Descriptive Statistics by Variable – Period 1 – March 2020

Variable	Mean	Median	Min.	Max.	Std. dev.
ESG	50.19	53.26	1.549	92.25	22.96
ENV	45.16	50.50	0	91.06	29.26
SOC	52.99	52.58	0.74	93.22	23.22
GOV	51.06	52.93	0.83	95.60	23.59
CASH	18.20	18.73	7.601	22.45	2.52
OPEINC	20.87	20.87	16.14	25.13	1.33
MKTC	23.29	23.38	14.23	29.25	1.825
ROA	0.04	0.05	-0.7658	0.47	0.11
STDEBT	20.71	20.66	11.10	26.83	2.05
LTDEBT	22.03	21.90	17.39	26.46	1.71
DIVP	0.53	0.37	0	2.07	0.44

Table 10
Descriptive Statistics by Variable – Period 2 – Full Year of 2020

Variable	Mean	Median	Min.	Max.	Std. dev.
ESG	48.50	51.44	1.115	91.54	23.60
ENV	43.28	48.63	0	92.89	29.33
SOC	50.71	54.02	0.50	96.81	25.22
GOV	50.33	51.96	0.82	95.38	24.26
CASH	18.46	18.52	9.85	23.46	2.30
OPEINC	21.04	21.15	15.10	24.86	1.48
MKTC	23.31	23.28	14.46	29.40	1.85
ROA	0.02	0.04	-0.98	0.30	0.14
STDEBT	20.78	20.80	11.17	27.03	2.21
LTDEBT	22.11	22.35	13.62	26.56	1.98
DIVP	0.4467	0.34	0	2.90	0.40

Comparing the economic and financial performance variables results in tables 9 and 10, the variables Cash, Short-Debt, Long-Term Debt and Operating Income increased from March 2020 compared to the figures for the entire year. The Market Capitalization variable maintained the same average, and the other variables decreased. The most significant deviation variables were Cash and Short-Term Debt for both periods. Meanwhile, the average results of ESG's variables (ESG Score, ENV, SOC and GOV) decreased comparing March 2020 with the full year results. The standard deviation is high and increased in the second period of analysis.

4.2 Correlation between variables

Before running the data regression, a correlation analysis is used to investigate whether there is any association between the variables.

Table 11 presents the pairwise Pearson correlation between the variables for March 2020, and Table 12 presents the correlation for the full year of 2020.

It is observed in Table 11 that DIVP is the most positively significant correlated with CAAR, while the variables CASH, MKTC and ROA are positive but not significantly; OPEINC, STDEBT and LTDEBBT are negatively and not significantly correlated with Q1 abnormal returns.

Regarding the ESG correlation, even if the results are negative, they are statistically significant, with ENV and GOV at 5%, and ESG and Social at 1%.

Table 12 shows that the ESG and Social Scores present a statistically significant result at 10% for the results of the full year of 2020. The DIVP is again the variable most highly correlated with CARR, although it did not present significance.

Contrary to the results found in Demers et al. (2021) research, the correlations reported in Table 12 suggest that ESG and SOC scores with abnormal returns positively correlate for the full year of 2020. In other words, after the market crash period (March 2020), the pairwise correlations supported the claims that ESG was a resilience factor for the full year of 2020.

Table 11
Correlation between variables – Period 1 – March 2020

	CAAR1	ESG	ENV	SOC	GOV	CASH	MKTC	ROA	OPEINC	STDEBT	LTDEBT	DIVP
CAAR1	1.00											
ESG	-0.29***	1.00										
ENV	-0.21**	0.90***	1.00									
SOC	-0.33***	0.93***	0.80***	1.00								
GOV	-0.22**	0.81***	0.61***	0.64***	1.00							
CASH	0.08	0.39***	0.38***	0.38***	0.26**	1.00						
MKTC	0.02	0.33***	0.32***	0.33***	0.13	0.35***	1.00					
ROA	-0.04	0.13	0.07	0.14	0.09	0.02	0.46***	1.00				
OPEINC	-0.15	0.26**	0.28**	0.31***	0.02	0.33***	0.73***	0.21**	1.00			
STDEBT	-0.09	0.36***	0.32***	0.38***	0.23**	0.49***	0.40***	-0.06	0.63***	1.00		
LTDEBT	-0.05	0.40***	0.45***	0.40***	0.23**	0.42***	0.48***	-0.32***	0.75***	0.74***	1.00	
DIVP	0.02**	0.06	-0.01	0.09	0.06	-0.16	-0.01	-0.07	-0.07	-0.04	0.00	1.00

Note. *** p<0.01; ** p<0.05; * p<0.1

Table 12
Correlation between variables – Period 2 – Full Year of 2020

	CAAR2	ESG	ENV	SOC	GOV	CASH	MKTC	ROA	OPEINC	STDEBT	LTDEBT	DIVP
CAAR2	1.00											
ESG	0.16*	1.00										
ENV	0.12	0.90***	1.00									
SOC	0.17*	0.93***	0.80***	1.00								
GOV	0.13	0.79***	0.56***	0.63***	1.00							
CASH	0.03	0.02	0.00	-0.01	0.09	1.00						
MKTC	-0.02	0.41***	0.41***	0.39***	0.24**	-0.02	1.00					
ROA	0.02	0.16*	0.16*	0.19**	0.05	-0.04*	0.30***	1.00				
OPEINC	-0.03	0.21**	0.26***	0.21**	0.07	0.30***	0.30***	0.57***	1.00			
STDEBT	-0.05	0.34***	0.35***	0.33***	0.26***	-0.07	0.23**	-0.18*	-0.16	1.00		
LTDEBT	0.01	0.44***	0.42***	0.40***	0.35***	0.03	0.46***	0.27***	0.15	0.63***	1.00	
DIVP	0.08	0.07	0.07	0.06	0.05	0.01	0.02	0.04	0.12	-0.11	-0.09	1.00

Note. *** p<0.01; ** p<0.05; * p<0.1

4.3 Event study results

This topic explores the results of the event study to assess how the market perceived and reacted to the impacts of the COVID-19 pandemic during the market crash and at the year-end of 2020.

Table 13 shows the cumulative average abnormal return (CAAR) calculation for different event windows by industry sector for the 112 companies of the sample. The result was positive (+3.09%) for the March 2020 (CAAR1) event window, while the result was negative (-0.13%) for the 2020 year-end results (CAAR2).

Finance and real estate companies, followed by retail, had positive abnormal returns in March 2020, while Energy & Transportation had the lowest result.

On the other hand, companies from Retail and Finance Services & Real State presented negatives abnormal returns in the full year of 2020.

These results corroborate the list published in the newspaper “Diário Oficial da União”, in September of 2020. The list of economic sectors most affected by the COVID-19 pandemic was prepared based on the sector’s sales variation. The relevant sector’s economy was also considered, in terms of added value and the number of people affected, in addition to the margin for each sector (Brasil, 2020).

According to this list, the ten economic activities most impacted by the COVID-19 pandemic in 2020 are:

- 1 – Artistic and creative shows.
- 2 – Air transportation.
- 3 – Railway and metro-rail transportation.
- 4 – Ground transportation.
- 5 – Public transportation.
- 6 – Hotel services.
- 7 – Food services.
- 8 – Manufacturing of vehicles.
- 9 – Manufacturing of footwear and leather goods.
- 10 – Sale of vehicles, spare parts, and motorcycles.

Table 13
Abnormal Results – CAAR

Sector	N	%	CAAR1	CAAR2
Agriculture, Forestry, and Fishing	1	1%	-0.89%	-1.78%
Mining	3	6%	-0.17%	-0.93%
Construction	7	17%	-2.41%	1.30%
Manufacturing	26	23%	6.47%	0.73%
Energy & Transportation	18	3%	-6.35%	-1.49%
Wholesale	2	9%	6.34%	-0.30%
Retail	10	20%	10.07%	-2.89%
Finance Services & Real Estate	23	2%	10.36%	-2.67%
Services	22	20%	-2.76%	1.20%
Total	112	100%	3.09%	-0.13%

4.4 Results of the regression – Ordinary Least Squares Estimates (OLS)

The chapter on the results found explains the relationship between the ESG performance with the abnormal returns of companies, then with the condition to be part of the ISE B3 portfolio, and finally with accounting-measures performance.

These results from the regression for March 2020 using CAAR as the dependent variable are presented in eight tables as explained in Table 14:

Table 14
Summary of the Tables' Results

Table	Results
15	OLS – ESG – March 2020
16	OLS – ESG – Full Year 2020
17	OLS – ENV – March 2020
18	OLS – ENV – Full Year 2020
19	OLS – SOC – March 2020
20	OLS – SOC – Full Year 2020
21	OLS – GOV – March 2020
22	OLS – GOV – Full Year 2020

For all tables: in column (1), it regresses CAAR on Refinitiv's ESG Scores; in column (2), it adds the Dummy Variable ISE B3; in column (3), it adds market capitalization variable, this variable is a proxy for size; and in column (4), it presents the results from a more completely specified regression that includes fundamental accounting-based measures of performance,

cash (liquidity), short-term debt and long-term debt (leverage), operating income, ROA, and Dividend Payout. Robust standard errors are reported in parentheses.

Table 15
OLS – ESG – March 2020

Variable	CARR (1)	CARR (2)	CARR (3)	CARR (4)
ESG	0.0046 *** (0.000899)	0.1234 (0.001078)	0.0862* (0.00111651)	0.1307 (0.001546)
MKTC			0.3634 (0.0115022)	0.1979 (0.033825)
CASH				0.6933 (0.014630)
ROA				0.9199 (0.937354)
OPEINC				0.0846* (0.058743)
STDEBT				0.6918 (0.029344)
LTDEBT				0.2398 (0.044551)
DIVP				0.2854 (0.071230)
ISEd		0.1262 (0.001078)	0.1175 (0.054496)	0.3110 (0.074129)
_cons	0.0011*** (0.04962)	0.0058*** (0.051402)	0.7364 (0.260029)	0.6931 (0.634510)
R-square	0.081428	0.1041119	0.112083	0.212202

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

In Table 15, the results from column (1), show that ESG is positive and statistically significant at 1% related to returns (0.0046). In column (2), when the Dummy variable ISE B3 is added, there is no statistical significance. In column (3), the ESG coefficient increased (0.0862) and became statistically significant at 10%. These results suggest that including a simple control and known determinant of returns (i.e., firm size) leads ESG to be a determinant of returns. Possibly, larger companies invested more in ESG factors in this analyzed period.

As shown in column (4), ESG remains not significant in these specifications. In contrast, the coefficient signs and magnitudes of most of the other control variables remain positives, but

only the variable of Operating Income shows statistical significance at 10%. The complete regression from column (4) explains approximately 21% of the overall variation in the Q1 COVID-19 pandemic period returns for the companies tested.

Table 16
OLS – ESG – Full Year of 2020

Variable	CARR (1)	CARR (2)	CARR (3)	CARR (4)
ESG	0.0892 *	0.0982*	0.0582*	0.7649
	(0.000327)	(0.000394)	(0.000418)	(0.000191)
MKTC			0.3099	0.7588
			(0.004592)	(0.003245)
CASH				0.4232
				(0.001776)
ROA				0.9151
				(0.098193)
OPEINC				0.1604
				(0.005025)
STDEBT				0.1586
				(0.002843)
LTDEBT				0.1422
				(0.003548)
DIVP				0.8469
				0.007831)
ISEd		0.6589	0.6822	0.5968
		(0.021161)	(0.021167)	(0.0085183)
_cons	0.1087	0.0976*	0.4850	0.2806
	(0.017643)	(0.001843)	(0.101723)	(0.065518)
R-square	0.026043	0.027791	0.037072	0.087304

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

Table 16 shows the ESG scores performance for the full year of 2020. The results (0.0892) show that the full year of 2020 abnormal returns are positive and significantly correlate with ESG scores at 10%, suggesting that companies with high ESG ratings realize a higher performance for the full year of 2020 of stock abnormal returns.

In column (2), when the Dummy variable ISE B3 was added, the coefficient of ESG increased (0.0982) and remained positive and statistically significant at 10%. In column (3), the coefficient ESG decreased (0.0582) but remained statistically significant at 10% after the addition of the MKTC variable.

However, when the accounting-based measure variables are included in the regression, ESG results (0.7649) become statistical not significant as an explanatory variable for the COVID-19 pandemic returns during the full year of 2020.

Table 16 reports that the complete regression from column (4) explains approximately 9% of the overall cross-sectional variation in the Full Year 2020 COVID-19 pandemic period returns for the companies tested.

Corroborating with Demers et al. (2021), the results suggest that investors could be prioritizing financial strength over ESG performance in the face of the COVID-19 pandemic, which means that traditional accounting-based measures of the firm's liquidity and profitability are important indicators of a company's stock price resilience during the early days of the unexpected global COVID crisis, although ESG is not. Also, as presented in the study of Cardillo et al. (2022), firms with more cash, more significant profits and less debt were more resilient to the pandemic's effect.

Table 17 shows the regression results for ENV scores. In column (1), the ENV result (0.0411) is significantly positively related to returns at 5%. In column (2) and column (3), even if the results of the ENV variable are not significant, the Dummy ISE variable shows positiveness and significance at 5%, suggesting some preference of investors for companies listed in the ISE B3 portfolio.

In column (4), ENV increased and remained positive (0.7230), even though not statistically significant, while the Operating Income variable result (0.0745) is the only one that shows significance at 10%. This variable does not include financial results.

Table 17 reports that the complete regression from column (4) explains approximately 18% of the overall variation in the Q1 COVID-19 pandemic period returns for the companies tested.

Table 17
OLS – ENV – March 2020

Variable	CARR (1)	CARR (2)	CARR (3)	CARR (4)
ENV	0.0411** (0.000720)	0.5494 (0.000853)	0.4600 (0.000883)	0.7230 (0.0025717)
MKTC			0.5163 (0.011633)	0.2240 (0.033395)
CASH				0.8025 (0.014560)
ROA				0.8480 (0.952093)
OPEINC				0.0745* (0.0593421)
STDEBT				0.7680 (0.029384)
LTDEBT				0.2268 (0.045088)
DIVP				0.2348 (0.070760)
ISEd		0.0420** (0.0548125)	0.0398** (0.055046)	0.1093 (0.0075820)
_cons	0.0086 *** (0.038722)	0.0184** (0.038491)	0.7678 (0.265055)	0.7046 (0.623377)
R-square	0.043198	0.084601	0.088761	0.182071

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

Table 18 shows the ENV scores. None of the variables presented significance in all regression.

ENV shows a better positive result (0.6926) when the accounting-based measure variables are included in the regression. However, it is not significant as an explanatory variable for the full year of 2020 abnormal returns during the COVID-19 pandemic.

Even if the ENV variable increased in the result of the entire regression specifications, it did not show statistical significance. Contrary to the results presented by Albuquerque et al. (2020), it was documented that high ENV score firms display lower volatility of stock returns, and firms with high ENV scores had higher operating profit margins during the COVID-19 pandemic (March 2020). The same results for Brazilian firms were found by Garcia (2022), showing that the companies with the best environmental performance presented the highest

returns for the period. In other words, the companies with the best Socio-Environmental performance were more resilient during the coronavirus crisis.

Table 18
OLS – ENV – Full Year of 2020

	CARR (1)	CARR (2)	CARR (3)	CARR (4)
ENV	0.1935 (0.000264)	0.2383 (0.000322)	0.1633 (0.000343)	0.6926 (0.000148)
MKTC			0.3963 (0.004636)	0.7223 (0.003262)
CASH				0.4543 (0.001797)
ROA				0.9140 (0.098122)
OPEINC				0.1557 (0.005031)
STDEBT				0.1408 (0.002802)
LTDEBT				0.1247 (0.003466)
DIVP				0.8316 (0.007800)
ISEd		0.8439 (0.021500)	0.8588 (0.025333)	0.6338 (0.008558)
_cons	0.2411 (0.013928)	0.2366 (0.014083)	0.4965 (0.103828)	0.2724 (0.064068)
R-square	0.015319	0.015671	0.02236	0.08823

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

Table 19
OLS –SOC – March 2020

Variable	CARR (1)	CARR (2)	CARR (3)	CARR (4)
SOC	0.0009*** (0.000855)	0.00327** (0.001016)	0.0187** (0.001053)	0.0359** (0.001486)
MKTC			0.2634 (0.001139)	0.2118 (0.033202)
CASH				0.5781 (0.014455)
ROA				0.9766 (0.920893)
OPEINC				0.1047 (0.057904)
STDEBT				0.7670 (0.028654)
LTDEBT				0.3096 (0.043969)
DIVP				0.2603 (0.069427)
ISEd		0.1166 (0.0547899)	0.1821 (0.053021)	0.4834 (0.073204)
_cons	0.0002 *** (0.049649)	0.0011*** (0.051408)	0.6695 (0.256746)	0.6886 (0.622936)
R-square	0.109184	0.124840	0.136596	0.240665

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

Table 19 shows the SOC scores. In all regresses, the variable SOC is significantly positively related to returns. Also, the complete regression from column (4) explains approximately 25% of the overall variation in the Q1 COVID-19 pandemic period returns for the companies tested.

Table 20
OLS –SOC – Full Year of 2020

	CARR (1)	CARR (2)	CARR (3)	CARR (4)
SOC	0.0760*	0.0870*	0.0541*	0.6278
	(0.000306)	(0.000355)	(0.000373)	(0.17290)
MKTC			0.3270	0.7499
			(0.004547)	(0.003241)
CASH				0.4058
				(0.001766)
ROA				0.8979
				(0.098242)
OPEINC				0.1512
				(0.005034)
STDEBT				0.1483
				(0.002806)
LTDEBT				0.1431
				(0.003509)
DIVP				0.8651
				(0.007833)
ISEd		0.7166	0.7710	0.6215
		(0.020337)	(0.020393)	(0.0082182)
_cons	0.0957*	0.0895*	0.5053	0.2574
	(0.0173221)	(0.017789)	(0.101302)	(0.065227)
R-square	0.028342	0.029521	0.038155	0.089331

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

Table 20 shows that the SOC variable presented significance of 10% in models (1), (2) and (3). These findings suggest the variable SOC as a product differentiation strategy during the crisis period, and that investors with a preference for social performance display more significant reductions in the volatility of stock returns. However, when the accounting-based measure variables are included in the regression, SOC shows a positive result (0.6278), although it is not significant as an explanatory variable for the COVID-19 pandemic Full Year 2020 returns.

Corroborating with the results in Table 20, Ding et al. (2021) defend that firms with more robust social activities before the pandemic had a better stock price performance in response to Q1 COVID-19, and social resilience is stronger among firms with social norms that

prioritize environmental and social issues. On the other hand, Engelhardt, Ekkenga and Posch (2021), found that the social score is as a predominant driver of positive results in stock price resilience, evidencing that ESG performance had a more explanatory stock resilience power in countries “with lower-trust poor security regulations, and low disclosure standards.”

Considering the stakeholder theory in which firms’ ESG activities are done because of the management’s desire to promote socially responsible activities regardless of their financial slack situation, Peng & Isa (2020) defend that ESG is positively associated with firm performance, while Lu and Khan (2023) findings offer valuable insights on how companies can strategize for emergency scenarios, enabling them to maintain their sustainability actions and investments, even in the face of crises periods.

These findings suggest that SOC scores as a product differentiation strategy during the crisis period, and that the company’s social performance displayed more significant reductions in the volatility of stock returns.

Table 21

OLS – GOV – March 2020

Variable	CARR (1)	CARR (2)	CARR (3)	CARR (4)
GOV	0.0312** (0.000891)	0.2096 (0.000937)	0;2004 (0.0009427)	0.0926* (0.0012588)
MKTC			0.5761 (0.011223)	0.1701 (0.033738)
CASH				0.8116 (0.014590)
ROA				0.6692 (0.932842)
OPEINC				0.0442* (0.058371)
STDEBT				0.7159 (0.029121)
LTDEBT				0.1557 (0.044622)
DIVP				0.2393 (0.070286)
ISEd		0.0271** (0.048557)	0.0235** (0.049578)	0.1147 (0.653215)
_cons	0.0078*** (0.050116)	0.0105** (0.049201)	0.9512 (0.2624)	0.6477 (0.632021)
R-square	0.047948	0.096424	0.099472	0.219627

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

Table 21 shows the GOV scores. In column (1), the result of the GOV variable (0.0312) is significantly and positively related to returns. In column (2) and column (3), even if the GOV variable is not significant, the Dummy ISE variable shows positiveness and significance at 5% (0.0271) and (0.0235) respectively, suggesting a preference of investors for companies listed in the ISE B3 portfolio.

As previously shown, the GOV variable (0.0926) remains significant at 10% when regressed with all specifications. The Operating Income variable (0.0442) also shows significance at 10%. These findings suggest GOV as a product differentiation strategy during the Q1 period of the crisis, and that investors who prefer GOV performance display more significant reductions in the volatility of stock returns.

Nevertheless, traditional accounting-based measures of the firm's liquidity and leverage are all critical indicators of a company's stock price resilience during the Q1 of the COVID-19 crisis.

Table 21 reports that the complete regression from column (4) explains approximately 22% of the overall cross-sectional variation in the Q1 COVID-19 pandemic period returns for the companies tested.

Table 22 shows the GOV variables results. None of them presented statistical significance. However, when the accounting-based measure variables are included in the regression, GOV increases, and shows a better positive result (0.8387), although it is not significant as an explanatory variable for the COVID-19 pandemic Full Year 2020 returns, while the variables ROA (0.9308), MKTC (0.7349) and DIVP (0.8154) have better and more positive results.

These results corroborate with Ding et al. (2021), affirming that there is no evidence that stock price reactions vary systematically with board structure or compensation systems in response to the COVID-19 pandemic.

Table 22
OLS –GOV – Full Year of 2020

	CARR (1)	CARR (2)	CARR (3)	CARR (4)
GOV	0.1572 (0.000318)	0.1973 (0.000345)	0.1721 (0.000350)	0.8387 (0.0001570)
MKTC			0.5423 (0.004416)	0.7349 (0.003277)
CASH				0.3968 (0.007767)
ROA				0.9308 (0.098242)
OPEINC				0.1686 (0.004980)
STDEBT				0.1406 (0.002932)
LTDEBT				0.1193 (0.003643)
DIVP				0.8154 (0.007826)
ISEd		0.9612 (0.019089)	0.8749 (0.019446)	0.4277 (0.007778)
_cons	0.177 (0.017798)	0.1827 (0.017946)	0.7175 (0.100836)	0.3328 (0.064205)
R-square	0.018108	0.018129	0.021515	0.086634

Note. Robust standard errors are in parentheses. *** p<0.01; ** p<0.05; * p<0.1

The summary of all the regression results is presented in Table 23, rejecting all four hypotheses of this study.

Table 23

Summary of the results

H	Hypothesis	Result
H1	ESG score protected the stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the Q1 market crash, compared to NOT listed companies	Rejected
H1 (a)	ENV scores protected the stock prices of the Brazilian public companies not listed in the index portfolio (ISE B3) during the Q1 market crash, compared to listed companies.	Rejected
H1 (b)	SOC scores protected the stock prices of the Brazilian public companies not listed in the index portfolio (ISE B3) during the Q1 market crash, compared to listed companies.	Rejected
H1 (c)	GOV scores protected the stock prices of the Brazilian public companies not listed in the index portfolio (ISE B3) during the Q1 market crash, compared to listed companies.	Rejected
H2	ESG score protected the stock prices of the Brazilian public companies listed in the index portfolio (ISE B3) during the full year of 2020, compared to listed companies	Rejected
H2 (a)	ENV scores protected stock prices of the Brazilian public companies not listed in the index portfolio (ISE B3) during the full year of 2020, compared to listed companies.	Rejected
H2 (b)	SOC scores protected stock prices of the Brazilian public companies not listed in the index portfolio (ISE B3) during the full year of 2020, compared to listed companies.	Rejected
H3 (c)	GOV scores protected stock prices of the Brazilian public companies not listed in the index portfolio (ISE B3) during the full year of 2020, compared to listed companies.	Rejected

5 Conclusion

The COVID-19 pandemic had an unforeseen and external impact on the financial market. The shock caused by the sudden arrival of the pandemic provided the possibility of identifying a possible causal relationship between the ESG performance and the financial performance of companies as a mechanism of the resilience in the companies listed in the sustainability index (ISE).

This study examined whether ESG was a determinant for stock price protection during the market crash period in 2020 due to the COVID-19 pandemic (March 2020) and the full year of 2020, comparing companies listed in the ISE B3 index portfolio with the ones who were not listed.

It was possible to broaden the understanding of the subject, focusing on studies previously published by authors such as Demers et al. (2021), Albuquerque et al. (2020), Ding et al. (2021), Cardillo et al. (2022), from a single database containing 112 companies with negotiations on the Brazilian Stock Exchange (B3) and ESG Scores, and finance figures reported in the year 2020, obtaining academic and practical contributions.

The company's financial performance information, including ESG scores, were obtained from Refinitiv Eikon® database. Furthermore, the information regarding stock price evolution was collected through the Economática® database. A significant challenge for this work was the number of variables available in the database combined with the small sample size.

The variables of interest regarding the stock price resilience during the COVID-19 pandemic, year 2020, considered to analyze the results were: 1) ESG Scores, including ENV, SOC, and GOV; 2) ISEd (Dummy variable for ISE B3 portfolio).

When analyzing the effects of stock price performance by studying abnormal stock returns for the COVID-19 pandemic, the combined results present a clear and consistent picture of ESG as a potential resilience factor during the global pandemic. None of the regressions tested showed negative results for the variables of the econometric model constructed.

Evidence was found indicating that the ESG Scores are positive and significantly associated with returns for March 2020, and for the full year of 2020. When adding the Dummy variable of ISE B3, only the dependent variables of ENV and GOV for March 2020, the results are positive and significantly correlated with abnormal returns. However, upon adding the financial performance variables, no significant association was observed with returns during the COVID-19 pandemic year (2020).

In this way, corroborating with the finding of Demers et al. (2021), it was concluded that ESG did not immunize stocks during the COVID-19 crisis. The same result is found in the research of Mello (2022), who studies the ISE B3 portfolio, concluding that, in times of crisis, which includes the specific analysis period of the COVID-19 pandemic, portfolios composed only of ISE B3 assets did not show statistically significant results.

In line with the findings of S. Bodhanwala and Bodhanwala (2023), Cardillo et al. (2022), and Demers et al. (2021) the results indicate that, during the COVID-19 pandemic, investors place greater emphasis on a company's financial strength compared to its ESG performance. This suggests that conventional accounting-based metrics, like higher cash holdings, liquid assets, lower debt levels, dividend yield and profitability carried more significance in determining a firm's stock price resilience in the initial stages of the unforeseen global COVID-19 pandemic crisis, whereas ESG factors had a diminished impact.

One of the limitations in this work is precisely the final sample size that was possible to obtain. With only 112 companies, and 29 companies listed in the ISE B3 portfolio, the database proved to be very sensitive to econometric model specifications.

The results presented in this study have academic and practical relevance for discussions on the impact of ESG on the stock price performance during a crisis period. From a theoretical point of view, this is the first study in Brazil related to companies listed in the ISE B3 portfolio.

For further studies, a more in-depth analysis on the relevance of the ISE B3 portfolio will be left for examination, also extending the studied period.

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