

CORPORATE SUSTAINABILITY INDEX: SHORT-TERM IMPACT ON THE MARKET VALUE OF COMPANIES INCLUDED IN THE ISE PORTFOLIO

O artigo foi aprovado e apresentado no congresso internacional de administração – adm 2025, realizado de 29/09 a 02/10 de 2025, em Ponta Grossa (PR).

Abstract: This study addresses the impact of the inclusion of companies in the Corporate Sustainability Index (*Índice de Sustentabilidade Empresarial* - ISE), of the Brazilian stock exchange, on the market value of their shares, in a context of a growing focus on organizational sustainability. The objective was to verify whether inclusion in the ISE contributes to the generation of abnormal returns to shareholders, signaling a possible change in the market's perception of the companies' values. Using historical series of share prices that made up the ISE's theoretical portfolios in the years 2021 to 2023, and an empirical-analytical methodology, this investigation applied the event study technique to compare the behavior of daily variations in share prices of ISE companies with the average market variations, represented by the Ibovespa index (IBOV). The analysis indicated that in the short term, the company's inclusion in the ISE changes investors' perception of its value, resulting in a differentiated performance of shares, which reinforces the hypothesis that sustainable practices affect investors' perception of the value of shares, reflected in price variations. The innovative result is that the differentiated performance of the shares of these companies joining the ISE proved to be negative in the period in question and lower than that of Ibovespa.

Keywords: Index effect; Business Sustainability; Investment portfolio.

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1 INTRODUCTION

The increase in environmental awareness has, over the last few decades, taken on increasingly greater dimensions, generating a significant impact on commercial practices and encouraging both companies and consumers to reflect on organizational responsibility in preserving natural resources. In the current scenario, characterized by high competitiveness, companies face pressure to adopt strategies that favor sustainable development, seeking to meet a social and market demand for practices that promote environmental balance and contribute to organizational sustainability (Barauskaite & Streimikiene, 2021).

Studies on the topic indicate that organizations that implement socio-environmental practices tend to obtain greater social acceptance and visibility in the market, in addition to being more prepared to respond to regulatory pressures and expectations from investors focused on social responsibility, according to Kim, Terlaak and Potoski (2021). Based on this movement, sustainability indicators were created in many markets, such as the Corporate Sustainability Index (*Índice de Sustentabilidade Empresarial* - ISE), on the Brazilian stock exchange, whose objective is to signal companies committed to sustainable practices, offering investors a reference of socially responsible companies and, theoretically, more prepared for future challenges (B3, 2024b; Duda, Silva, Lagioia & Santos, 2022).

Despite the large number of studies that associate corporate sustainability with improvements in social acceptance and market performance, there is a gap in the literature with regard to robust empirical evidence of the relationship between social responsibility practices and the creation of long-term economic value for shareholders (Kim et al., 2021; Monteiro, Santos & Santos, 2020; Pletsch, Silva & Hein, 2015; Silva, Santos & Alcoforado, 2021; Todeschini & Mello, 2013). Although authors such as Singh, Sethuraman and Lam (2017) and Kalai and Sbais (2019) have identified positive correlations between socio-environmental practices and financial gains, others, such as Wang, Dou and Jia (2016), maintain that this relationship is complex and depends on external variables that do not always favor such a link. There are also studies that characterize sustainability policies as a way of undermining the value of companies, considering that the company's main function is to provide the highest possible return to shareholders (Geczy, Stambaugh & Levin, 2021).

Considering that much research carried out in recent years on the topic was conducted in foreign contexts (Kalai & Sbais, 2019; Kim et al., 2021; Pizzi, 2018), this study aims to bring a more contextualized analysis to the Brazilian market, where economic and regulatory specificities can impact this relationship between sustainability and market value. Therefore, we intend to contribute to filling this gap in knowledge, by analyzing the evolution of the market value of Brazilian companies listed on B3 and comparing the performance of stock returns of companies included in the theoretical portfolio of the ISE with those that are not part of this index. In this way, we seek to offer a contribution to this field of knowledge by verifying whether, in the Brazilian market, adherence to sustainability practices results in a different perception among investors regarding the market value of companies. The research employs a methodology based on the analysis of Corrêa and Euflausino (2023), examining the relationship between inclusion in the ISE and the variation in market value in the short term, with the aim of generating empirical evidence relevant to the national context.

The contributions of this research aim to expand the understanding of the economic viability of corporate sustainability in Brazil, offering insights for companies and investors seeking to integrate socio-environmental factors into financial decisions. This work aims to investigate and, possibly, corroborate the findings of authors such as Barauskaite and Streimikiene (2021), who argue that sustainability practices can add value to both shareholders and society.

2 LITERATURE REVIEW

B3 – *Brasil, Bolsa, Balcão* – the company that operates the Brazilian stock exchange, created, in collaboration with several entities, the ISE in 2005, with the aim of developing a stock indicator that would serve as a guide for socially conscious investments. As the fourth index of its kind to be created in the world and the pioneer in Latin America, according to Marcondes and Bacarji (2010), the ISE plays a fundamental role as a reference point, allowing investors to compare and evaluate the performance of companies committed to sustainable practices (B3, 2024a).

Society's growing awareness and demand for socially responsible companies has led investors to direct their resources to entities that adopt sustainable practices and are still profitable. In response to this demand, the ISE is based on the concept of the Triple Bottom Line, proposed by Elkington (1998), which considers the environmental, social and economic-financial aspects of a company. This balance between factors drove the emergence of new standards of governance and social responsibility, encompassing all business activities through sustainable challenges (Marcondes & Bacarji, 2010).

To be included in the ISE portfolio, companies listed on B3 must meet several criteria, such as being among the 200 companies with the highest liquidity, having a presence in at least 50 % of trading sessions during the last three evaluation periods, not being considered "penny stock", meeting sustainability requirements, and being selected by the ISE Deliberative Council (B3, 2024b).

As noted by Marcondes and Bacarji (2010), the ISE offers advantages to investors, such as increasing the level of credibility of companies and serving as a reference for various equity funds, in addition to contributing to the enhancement of companies' reputation and brand. Furthermore, the index has been the subject of relevant discussion by some authors, who seek to analyze the benefits that inclusion in the portfolio and the adoption of a new business model can bring to organizations.

Several studies have investigated the profitability of the ISE theoretical portfolio in relation to that of the Ibovespa, Brazil's main stock index. Gomes and Tortato (2011), for example, conducted corporate studies on the return of the ISE in relation to other conventional B3 indices, concluding that although the ISE has distinct characteristics, its return does not differ significantly from the others. Carvalho Filho, Pimentel, Bertino and Oliveira (2018) highlighted in their research the lack of disclosure of information on environmental liabilities by approximately 43 % of the companies that are part of the ISE between 2012 and 2015, which negatively affects investors and other users of financial statements.

Although Corporate Social Responsibility is a broad topic and the subject of several studies, there is a consensus among them that the organizational management model should consider not only financial aspects, but also the non-financial (Orellano & Quiota, 2011). Thus, it is understood that companies, being increasingly aware of the importance of environmental aspects and the generation of wealth in a sustainable way (Silveira & Pfitscher, 2013), must seek to optimize their relationships with society, simultaneously promoting their social, economic, and environmental performance (Di Domenico, Mazzioni, Gubiani, Kronbauer & Vilani, 2015).

A wide range of research, both national and international, addresses the interaction between socially responsible investments and financial performance. The main demand of these studies is to investigate whether these investments outperform, fall short of, or are equal to other conventional investments that do not consider environmental, social, and corporate governance (ESG) criteria in asset selection.

The research by Beato, Souza, and Parisoto (2009) aimed to examine the composition, adherence, and profitability of sustainability indices in the stock market, using the ISE index for comparison with the Ibovespa. Initially, low participation was observed among qualified companies, with only 37 % of them responding to the questionnaires, indicating possible disinterest or lack of preparedness on the part of the companies at that time. Regarding the profitability of the indices, it was found that the sustainability indices were more profitable over the three years analyzed, despite having underperformed in the second year compared to Ibovespa.

In this same line of investigation, Nardy, Famá, Guevara and Mussa (2015) interpreted the "index effect" as changes in the behavior of company share prices after their inclusion in a benchmark portfolio. In other words, from the perspective of Behavioral Finance, it can be described as an abnormally high return on the prices of assets recently added to a market index.

The research by Silva and Callado (2020) applied the Event Study technique to verify whether the inclusion of companies in the Global 100 ranking affected cumulative abnormal returns (CAR). The research period was from 2005 to 2016. The results indicate that inclusion in the index did not cause a significant effect on returns. The authors suggest that the information would already be incorporated into the prices.

In a recent study, Silva et al. (2021) conducted a comparative analysis of the results of the economic-financial indicators of companies in the banking sector listed on B3 that participate and do not participate in the ISE portfolio. A two-tailed Student's t-test was applied to verify whether the means of the two groups are statistically equal or different. Solvency and liquidity indicators were also included in the analysis, representing an advance over existing literature. The results obtained for the profitability and return indicators showed divergences in relation to previous studies, suggesting that participation in the ISE portfolio may not provide better financial results in the short term, but may be beneficial in the long term due to the stability and security of the shares, which attracts investors. In contrast, the capital and risk, liquidity and solvency indicators did not present such consistent results, indicating that participation in the ISE portfolio does not generate superior results.

Monteiro et al. (2020) conducted a study to investigate the relationship between the ISE and the economic and financial performance of publicly traded companies listed on B3 from 2014 to 2017. To do this, they used multiple panel regression to analyze the relationships between the selected performance variables (ROA, ROE and EBITDA), considering two groups of companies: those that are part of the ISE and those that are not. The results of this research indicated that companies participating in the ISE showed superior economic and financial performance compared to those that do not participate. Furthermore, as with previous studies, this research highlighted the existence of a direct relationship between companies' participation in the ISE and better performance in terms of Return on Total Assets, Net Worth, and Profitability of Operations.

In the work of Corrêa and Euflausino (2023), which is the basis for this study, it was observed that only the shares of one in ten companies presented returns different from the returns of the market portfolio (Ibovespa), with statistical significance, in the first year after entering the theoretical portfolio of the ISE. This result indicates that although there is demand for more sustainable shares on the part of companies, these initiatives do not seem to cause impacts on the market value of the companies. The researchers also point to three main studies by notable Brazilian authors regarding the index effect: Salazar (1997), Procianoy and Verdi (2006), and Serra, De Lima, Martelanc and Lima (2011).

Salazar (1997) applied an event study with companies recently included in the Ibovespa portfolio, testing 17 companies. The results showed that newly included companies exhibited abnormally high returns in the days close to the effective date of inclusion in the portfolio, with significant positive cumulative returns throughout the post-event window.

Procianoy and Verdi (2006) examined the occurrence of the index effect for volume and returns of inclusions and exclusions in the theoretical portfolios of four Brazilian indices: Ibovespa, IBRX50, IBRX100, and FGV100. They observed that the effect was present only in the IBRX50, but there was an increase in transaction volume for all indices.

Serra et al. (2011) investigated the occurrence of abnormal price returns around the effective and prior announcement dates of the inclusion event in the ISE portfolio, using a sample of 55 Ibovespa companies. The results revealed changes in the share prices of newly included companies before the effective announcement of the benchmark portfolio, followed by a drop in share value after the announcement.

The research by Cristófalo et al. (2017) is another relevant work in the national context that explored whether participation in the ISE index was associated with performance in the financial market. The study analyzed the period from 2006 to 2014 and considered four segments for the sample: Banks, Electric Power, Paper and Pulp, and Petrochemicals. The results were heterogeneous by sector. Companies in the banking and petrochemical sectors that were part of the ISE showed superior performance compared to those that were not, while no difference was observed for the other segments. The authors suggest that it is not possible to indicate a direct association between inclusion in the index and stock appreciation.

Internationally, the research by Zago, Jabbour, and Bruhn (2018) stands out, investigating whether the inclusion of companies in the Dow Jones Sustainability Index (DJSI) would provide higher returns. Using the Event Study technique, the researchers found no evidence of higher returns after inclusion in the index. The results indicate that the disclosure of participation in the DJSI does not generate an immediate positive reaction in the market. The sample consisted of companies that were listed on the index in the 2013/2014 cycle.

Also internationally, the work of Adamska and Dabrowski (2021) can be cited, which analyzed how events of inclusion and removal of companies in corporate sustainability indices affect investor response. The research period was from 2009 to 2017, evaluating events in six countries: Brazil, Japan, South Africa, Poland, the United Kingdom, and the United States. The results suggest that reactions are not homogeneous across markets and are influenced by the institutional environment of each country. Exclusion from the indices generates more intense negative impacts than the gains associated with inclusion, especially in emerging markets.

Chart 1 presents the main findings of the research that underpins this literature review on the participation of companies in sustainability indices.

Chart 1 – Summary of empirical evidence from previous studies

AUTHORS	MARKET	CONTRIBUTION
Beato, Souza and Parisoto (2009)	Domestic	Low participation in the ISE and superior profitability of the index compared to the IBOV
Serra et al. (2011)	Domestic	Presence of abnormal returns before the effective inclusion in the ISE portfolio
Cristófalo et al. (2017)	Domestic	The effects of participation in the ISE are heterogeneous by segment, with no evidence of a direct relationship
Zago, Jabbour and Bruhn (2018)	International	Inclusion in the DJSI does not generate abnormal returns or an immediate positive reaction in the markets
Monteiro et al. (2020)	Domestic	Participation in the ISE is associated with superior economic and financial performance
Silva et al. (2021)	Domestic	The participation of banks in the ISE portfolio does not guarantee better results in the short term
Adamska and Dabrowski (2021)	International	Reactions to inclusion and exclusion from sustainability indices vary between countries, with exclusion being associated with more intense impacts
Corrêa and Euflausino (2023)	Domestic	Entry into the ISE does not generate statistically significant impacts on returns

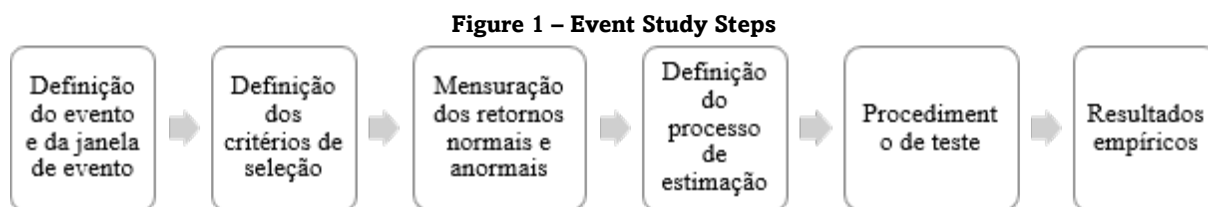
Due to the heterogeneity of results obtained in the studies mentioned in this review, the main hypothesis (and its alternative) proposed here can be formulated as follows:

- H_0 - The returns of companies entering the ISE portfolio do not differ significantly from the returns of the market index (IBOV) – indicating the absence of abnormal returns.
- H_1 - The returns of companies entering the ISE portfolio differ significantly from the returns of the market index (IBOV) – indicating the presence of abnormal returns.

3 METHODOLOGY

The Event Study technique employed in this work is based on that used by Corrêa and Euflausino (2023), aiming to measure the evolution of the market value of the main companies listed on B3, starting from the event “inclusion of shares in the ISE theoretical portfolio”. In this way, it seeks to identify whether there are differences between the behavior of the returns offered by the variations in the share prices of those companies considered sustainable and the others, after the inclusion of the companies’ shares in the ISE theoretical portfolio, aiming to assess how this event affects the market value of the companies in the short term.

Regarding the procedures that make up the Event Study, Mackinlay (1997) defined a series of steps for its conduct, as illustrated in Figure 1, which were followed in this study.



Source: Adapted from Mackinlay (1997)

In this study, the event of interest (“date zero”) was defined as the announcement of the company’s inclusion in the ISE theoretical portfolio. The event window is 15 days before the announcement of inclusion in the index and 360 days (1 year) after inclusion. This period aims to identify any factors that may have influenced abnormal gains before the portfolio announcement, and its duration seeks to identify whether there is continuity of abnormal returns.

In the second stage, when defining the selection criteria, the set of companies that were part of the ISE theoretical portfolio in the period from 2021 to 2023 was used as a sample. And for the control group, the Ibovespa (IBOV) theoretical portfolio was chosen. The use of IBOV as a control group in the event test aims to eliminate generalized market movements in the evaluation of companies.

For the calculation of stock returns, the continuous capitalization regime was used, expressed by Equation 1:

$$R_t = \ln \left(\frac{P_t}{P_{t-1}} \right) \quad [\text{Equation 1}]$$

Where:

R_t is the stock return at time t ;

P_t e P_{t-1} are the stock prices at time t and at time $t-1$, respectively.

This model implies a symmetrical or log-normal frequency distribution, which is more appropriate, since parametric statistical tests require working with the normal distribution.

Camargos and Barbosa (2003) define that in event studies, the impact of the event is measured by calculating the abnormal return. Abnormal returns correspond to the difference between the returns observed in the event window and the normal returns expected during the same period, without considering the occurrence of the event. In this study, abnormal returns will be determined using methodologies that adjust the return to a market index (Ibovespa) and that include comparison with control groups. Thus, the abnormal return for a firm i and date t will be calculated according to Equation 2:

$$AR_{it} = R_{it} - R_{mt} \quad [\text{Equation 2}]$$

Where:

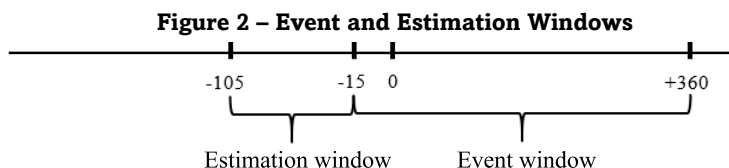
AR_{it} is the abnormal return of stock i at time t ;

R_{it} is the observed return of stock i at time t ;

R_{mt} is the return of the market portfolio (Ibovespa) at time t .

Thus, the behavior of each company’s share returns will be analyzed considering the period of one year after its inclusion in the ISE theoretical portfolio. The variable to be analyzed in the event test, therefore, is the daily variation in the share price, and the statistical method employed will be the t-test for independent samples. Two sets of data will be compared: the daily variation in the company’s share price, representing the sample where the event occurred, and the daily variation in the IBOV value, representing the control sample, where the event did not occur.

In this study, the estimation window will correspond to the 90-day period (-105, -15) before the event window (-15, +360), thus avoiding the overlap of the estimation and event windows, as shown in Figure 2.



In the penultimate phase of the event study, it is necessary to define the technique for aggregating abnormal returns and establishing the null hypothesis. According to Camargos and Barbosa (2003), it is fundamental to define a test structure that allows the calculation of abnormal returns. They explain that due to the difficulty in determining the exact date on which the market becomes aware of the event under study and the fact that reactions can occur over several days, it is common to accumulate abnormal returns over these days. This allows for the evaluation of price reactions during the event window, with this accumulation being done over time and across securities.

Furthermore, the authors emphasize the importance of not considering isolated cases, but rather simultaneously evaluating several securities from different companies, in order to fulfill the objective of event analysis: to analyze the impact of economic and financial events on securities prices in the capital market.

The technique mentioned by Camargos and Barbosa (2003) is called cumulative abnormal return or CAR and can be described by Equation 3:

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} \sum_{i=1}^N \frac{AR_{i,t}}{N} \quad [\text{Equation 3}]$$

Where:

$CAR(t_1, t_2)$ is the cumulative abnormal return between the period t_1 days before the event and t_2 days after the event;

$AR_{i,t}$ is the abnormal return of stock i at time t ;

N is the number of companies.

With variance given by Equation 4:

$$Var[CAR(t_1, t_2)] = \frac{1}{N^2} \sum_{i=1}^N \sigma_i^2(t_1, t_2) \quad [\text{Equation 4}]$$

Where:

$Var[CAR(t_1, t_2)]$ is the variance of the cumulative abnormal return between the period days before the event and days after the event;

σ_i^2 is the variance of the returns of stock i in the period t_1 to t_2 ;

N is the number of companies.

Based on the idea that there is no clustering and, consequently, the covariance is zero, the CARs meet the following conditions:

$$CAR(t_1, t_2) \sim N[\sigma_i^2(t_1, t_2)]$$

4 RESULTS

Respecting the established event and estimation windows, the reference dates for data collection are defined in Table 1.

Table 1 – Dates of the event and estimation windows for the ISE Portfolios

DATES	2021	2022	2023
Start of the estimation window ()	18/08/20	15/09/21	14/09/22
End of the estimation window and start of the event window ()	16/11/20	14/12/21	13/12/22
Event (0)	01/12/20	29/12/21	28/12/22
End of the event window ()	26/11/21	24/12/22	23/12/23

Chart 2 shows the companies that comprised the ISE portfolios from 2021 to 2023, highlighting the new entrants in each year.

Chart 2 – Companies entering the theoretical ISE portfolios from 2021 to 2023

2021		2022		2023	
AES Brasil	Santander	AES Brasil	MRV	Aeris	Iochpe Maxion
B2W	Sendas	Americanas	Natura	AES Brasil	Irani
Banco do Brasil	Suzano	Ambipar	Neoenergia	Aliansce Sonae	Itaú Unibanco
BR Distribuid.	Telefônica	Arezzo	Raia Drogasil	Ambev	Itaúsa
Bradesco	Tim	Azul	Rumo	Ambipar	Klabin
BRF	Weg	Bradesco	Santander	Arezzo	Lojas Renner
BTG Pactual		Banco do Brasil	Simpár	Azul	M. Dias Branco
CCR		BTG Pactual	Sul America	B3 S.A.	Magazine Luiza
Cemig		Braskem	Suzano	Banco do Brasil	Marfrig
Cielo		BRF	Telefônica	Banco Pan	Minerva
Copel		CCR	Tim	Bradesco	Movida
Cosan		Cemig	Via	BRF	MRV
CPFL		CBD	Vibra	BTG Pactual	Natura
Duralex		Cielo	Weg	CCR	Neoenergia
Ecorodovias		Copel		Cemig	Raia Drogasil
EDP		Cosan		CBA	Raízen
Eletrobrás		CPFL		CBD	Rede D'or
Engie		Dexco		Cielo	Rumo
Fleury		Ecorodovias		Cogna	Sanepar
GPA		EDP		Copel	Santander
Itaú Unibanco		Eletrobrás		Cosan	Santos Brasil
Itaúsa		Engie		CPFL	Sendas
Klabin		Fleury		CTEEP	Simpár
Light		Iochpe Maxion		Dexco	SLC Agrícola
L. Americanas		Itaú Unibanco		DASA	Suzano
Lojas Renner		Itaúsa		Ecorodovias	Telefônica
M. Dias Branco		Klabin		Eletrobrás	Tim
Marfrig		Light		Eneva	Usiminas
Minerva		Lojas Renner		Engie	Vamos S.A.
Movida		M. Dias Branco		Fleury	Via
MRV		Magazine Luiza		Gafisa	Vibra
Natura		Marfrig		Grendene	Weg
Neoenergia		Minerva		Guararapes	
Petrobras		Movida		Hypera	

Data source: B3 (2024)

In 2021, 11 companies entered the ISE portfolio: BTG Pactual, Cosan, CPFL, GPA, M. Dias Branco, Marfrig, Minerva, Neoenergia, Petrobrás, Sendas (Assaí), and Suzano. In this study, the company Sendas (Assaí) was not considered in the analysis because it only became part of the portfolio on March 1st 2021, due to the partial spin-off of Cia. Brasileira de Distribuição (GPA) (B3, 2024b).

The average variation of the IBOV in the period from August 18th 2020 - beginning of the estimation window - to November 11th 2021 - end of the event window - was positive, at a value of 0.0082446 % with a standard deviation of 1.3644458. Table 2, below, presents for the analyzed companies in the 2021 ISE portfolio, the data on average daily variation, standard deviation of return, and results of the t-test for independent samples.

Table 2 – Statistics on the stock returns of companies entering the ISE portfolio in 2021

INDEPENDENT SAMPLES T-TEST				
COMPANY	AVERAGE DAILY VARIATION (%)	STANDARD DEVIATION	TWO-TAILED P-VALUE	RESULT
BTG Pactual	0.056058	3.313143	0.0000000	Reject H_0
Cosan	0.017535	2.293017	0.0124035	Reject H_0
CPFL	-0.004515	1.765534	0.0000000	Reject H_0
GPA	-0.241873	6.710803	0.0000000	Reject H_0
M. Dias Branco	-0.073256	1.890668	0.0000000	Reject H_0
Marfrig	0.146191	2.122002	0.3805025	Fail to reject H_0
Minerva	-0.092657	2.388567	0.0000000	Reject H_0
Neoenergia	-0.022411	1.710444	0.0000000	Reject H_0
Petrobras	0.100066	2.777649	0.0000000	Reject H_0
Suzano	0.022924	2.205870	0.0002543	Reject H_0

Thus, the results presented in Table 2 indicate that of the ten companies tested, nine show evidence of having suffered variations resulting from the tested event, that is, they reject the Null Hypothesis (H_0) that the companies entering the ISE portfolio did not present returns significantly different from the market average, represented by the IBOV index. Of these companies, only Marfrig did not present results indicating that there are differences between the oscillations of the company and the control group during the period of the analyzed event.

In 2022, twelve companies entered the ISE: Ambipar, Arezzo, Azul, CBD, Iochpe Maxion, Magazine Luiza, Raia Drogasil, Rumo, Simpar, Sul America, Via, and Vibra.

The average variation of the IBOV in the period from September 15th 2021 - beginning of the estimation window - to December 23rd 2022 - end of the event window - was negative, at -0.0179994 % with a standard deviation of 1.3568661. Table 3, below, presents for the analyzed companies in the 2022 ISE portfolio, the data on average daily variation, standard deviation of return, and results of the t-test for independent samples.

Table 3 – Statistics on the stock returns of companies entering the ISE portfolio in 2022

INDEPENDENT SAMPLES T-TEST				
COMPANY	AVERAGE DAILY VARIATION (%)	STANDARD DEVIATION	TWO-TAILED P-VALUE	RESULT
Ambipar	-0.320934	3.546835	0.0000000	Reject H_0
Arezzo	-0.004318	2.517289	0.0000000	Reject H_0
Azul	-0.352055	4.378504	0.0000000	Reject H_0
CBD	-0.132765	2.948548	0.0000000	Reject H_0
Iochpe Maxion	-0.041695	2.536844	0.0000000	Reject H_0
Magazine Luiza	-0.579674	5.222800	0.0000000	Reject H_0
Raia Drogasil	-0.020926	1.974081	0.0000000	Reject H_0
Rumo	0.012526	2.264591	0.1733259	Fail to reject H_0
Simpar	-0.211603	3.165525	0.0000000	Reject H_0
Sul America	-0.108715	3.875810	0.0000000	Reject H_0
Via	-0.395849	4.587124	0.0000000	Reject H_0
Vibra	-0.131514	2.329024	0.0000000	Reject H_0

Thus, the results of the statistical tests presented in Table 3 indicate that of the twelve companies analyzed, eleven showed evidence of returns significantly different from the IBOV returns, which demonstrates the presence of abnormal returns. Of these companies, only Rumo did not present results indicating that there are differences between the company's fluctuations and the control group during the period of the event analyzed.

In 2023, 22 companies entered the ISE: Aeris, Aliansce Sonae, Ambev, B3 S.A., Banco Pan, CBA, Cogna Educação, CTEEP, DASA, Eneva, Gafisa, Grandene, Guararapes, Hypera, Irani, Raízen, Rede D'Or, Sanepar, Santos Brasil, SLC Agrícola, Usiminas, and Vamos S.A.

The average variation of the IBOV in the period from September 14th 2022 - beginning of the estimation window - to December 23rd 2023 - end of the event window - was positive, at a value of 0.0566825 % with a standard deviation of 1.2239432. Table 4, below, presents, for the analyzed companies in the 2023 ISE portfolio, the data on average daily variation, standard deviation of return, and results of the t-test for independent samples.

Table 4 – Statistics on the returns of stock of companies entering the ISE portfolio in 2023

INDEPENDENT SAMPLES T-TEST				
COMPANY	AVERAGE DAILY VARIATION (%)	STANDARD DEVIATION	TWO-TAILED P-VALUE	RESULT
Aeris	-0.291133	4.530669	0.0000000	Reject H_0
Aliansce Sonae	0.122023	2.069824	0.0000000	Reject H_0
Ambev	-0.008215	1.365862	0.0000000	Reject H_0
B3 S.A.	0.049499	2.588411	0.0010536	Reject H_0
Banco Pan	0.052755	2.643004	0.9408011	Fail to reject H_0
CBA	-0.292613	3.556033	0.0000000	Reject H_0
Cogna Educação	0.076091	3.078655	0.0060819	Reject H_0
CTEEP	0.072496	1.313396	0.0000000	Reject H_0
DASA	-0.228091	4.181557	0.0000000	Reject H_0
Eneva	-0.047239	2.049944	0.0000000	Reject H_0
Gafisa	-0.143550	7.009054	0.0000008	Reject H_0
Grendene	0.041563	2.022024	0.0000000	Reject H_0
Guararapes	-0.127655	4.254976	0.0000000	Reject H_0
Hypera	-0.047171	1.876969	0.0000000	Reject H_0
Irani	0.137797	2.037059	0.0000000	Reject H_0
Raizen	0.038589	2.782115	0.0000000	Reject H_0
Rede D'or	-0.045201	2.790512	0.0000000	Reject H_0
Sanepar	0.190910	1.792374	0.0000000	Reject H_0
Santos Brasil	0.072198	2.405166	0.0000000	Reject H_0
SLC Agrícola	-0.011511	1.707337	0.0065555	Reject H_0
Usiminas	0.043698	2.242165	0.0000000	Reject H_0
Vamos S.A.	-0.092516	3.054140	0.0000000	Reject H_0

The results of the statistical tests presented in Table 4 indicate that, of the 22 companies analyzed, 21 showed evidence of significant variations associated with the tested event, that is, they reject the Null Hypothesis (H_0) of the absence of accumulated abnormal returns after the inclusion of the companies in the ISE portfolio. Of these companies, only Banco Pan did not present results indicating that there are differences between the oscillations of the company and the control group during the period of the analyzed event.

After analyzing the companies separately using the t-test with the CAR as the variable for each company, a t-test for independent samples was finally performed using the Cumulative Average Abnormal Return (CAAR) for each ISE portfolio – using data from the companies entering each portfolio. Table 5 below presents the results of the statistical test. The three portfolios showed evidence of significant variations associated with the tested event, that is, they reject the Null Hypothesis (H_0) of the absence of CARs after the announcement of the inclusion of the companies in the ISE portfolio. Table 6 below shows the comparison of the Average Daily Variation of the entering companies in the ISE portfolios from 2021 to 2023 and the IBOV in the same years.

Table 5 – Results of the independent samples' t-test for companies entering the ISE portfolio from 2021 to 2023

ENTRANT COMPANIES		INDEPENDENT SAMPLES T-TEST	
YEAR	AVERAGE DAILY VARIATION (%)	TWO-TAILED P-VALUE	RESULT
2021	-0.0091939	0.0000000	Reject H_0
2022	-0.1906267	0.0000000	Reject H_0
2023	-0.0198761	0.0000000	Reject H_0

Table 6 – Average Daily Variation (%) of companies entering the ISE and IBOV Portfolios

AVERAGE DAILY VARIATION (%)			
GROUP	2021	2022	2023
Entrant companies in the ISE portfolio	-0.0091939	-0.1906267	-0.0198761
IBOV	0.0000824	-0.0179994	0.0566826

The results of the t-test indicate the rejection of hypothesis H_0 for all periods analyzed, evidencing the presence of abnormal returns. However, these abnormal returns are negative, which suggests performance below the market average, represented by the IBOV.

The presence of negative abnormal returns for most of the companies entering the ISE portfolio implies that these stocks systematically presented returns below the IBOV during the post-entry period. This result seems to indicate that the fact that these companies are incorporated into the portfolio of organizations committed to corporate governance practices, in itself, did not guarantee performance superior to the market index. A total of 44 incoming assets were analyzed, of which 41 showed statistically different performance from the market. The returns of each of these assets are influenced by several fundamental factors of each company, as well as by political and economic variables, in addition to governance practices. Therefore, the event of entering the ISE portfolio has, in most cases, been associated with negative abnormal returns in the short term.

5 CONCLUSIONS

Unlike what was reported in the study conducted by Corrêa and Euflausino (2023), which used data from the ISE portfolios between 2011 and 2013, the formation of portfolios in the more recent period, between 2021 and 2023, showed an increase in the number of B3 companies that returned the completed questionnaires and participated in the selection process for the inclusion of their shares in the ISE theoretical portfolio. Low company turnover was observed, with fewer companies leaving the theoretical portfolios, and, considering that the number of companies in the portfolio increased from 30 in 2020 to 66 in 2023, it was possible to see an increase in the companies' interest in joining the ISE, which highlights the recognition of its importance.

The variations in the share prices of each company were analyzed during the year following its inclusion in the ISE. It was observed that only three of the 44 companies studied had shares whose returns did not show significantly different behavior from the market in the first year after inclusion in the index. Thus, an important conclusion is that from a short-term perspective, entry into the ISE portfolio contributed to a change in investors' perception of the company's market value, reflected in the daily behavior of its share prices. Therefore, the Null Hypothesis (H_0) that the accumulated abnormal returns are equal before and after the disclosure of the inclusion of companies in the ISE portfolio was rejected, and it is inferred that inclusion in the ISE impacted the market's perception of the companies' ability to generate value after the new classification, reflected in price variations in the short term.

However, comparing the average daily variations of companies entering the ISE theoretical portfolios from 2021 to 2023 with the average daily variations of the IBOV in the same years indicates that in addition to the returns being abnormal (rejecting H_0), they were negative and lower than those of the Ibovespa. This is an innovative result.

The main conclusions of this study are, therefore, in light of the established conditions, that: (i) the so-called "index effect" occurred in the observed period, that is, the behavior of share returns was altered after the company entered the ISE theoretical portfolio; and (ii) the returns of the shares of companies entering the ISE were negative in the first year after the event and, on average, lower than the performance of the Ibovespa. The implication of the first conclusion is that investors' perception of the market value of companies changes with the inclusion of their shares in the ISE theoretical portfolio. This finding aligns with those pointed out by previous studies such as those by Salazar (1997), Nardy et al. (2015) and, correlatively, Monteiro et al. (2020). However, the second conclusion diverges from the results of these studies.

The finding that investors' perception of the market value of companies changes consistently (with statistical validity) when their shares are included in the ISE portfolio, but that it is a negative perception (the performance of share returns worsens), goes against the theoretical precepts of corporate sustainability and the value of ESG initiatives taken by companies. Although research such as that by Nardy et al. (2015), Singh et al. (2017), Kalai and Sbais (2019), and Monteiro et al. (2020) has detected positive relationships between socio-environmental practices and financial gains, others, whose results align with those obtained here, such as Wang et al. (2016), Geczy et al. (2021) and Silva et al. (2021) point out that this relationship is complex, depends on other external variables, and that sustainability policies may even harm the perceived value of companies.

This research uses the IBOV index as a proxy to represent market returns; however, despite its representativeness, this index does not encompass the market as a whole, constituting a limitation of the study. For future research, it is suggested that other techniques be used to assess the increase in the level of corporate governance practices, as well as other proxies to measure them. In addition, it is recommended to include other variables that may affect returns, in order to isolate the effect of ESG practices. Other timeframes are also recommended, as well as comparisons with international markets.

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