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Analysing Stock Market Performances of Energy Companies Traded on Borsa Istanbul in Terms of Sustainability*

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ABSTRACT

This study examines whether the announcement of the inclusion of companies in the sustainability index has an impact on the stock market performance of the companies. Research focuses on analyzing the potential impact of the announcement that 9 Turkish companies including in the Borsa Istanbul Sustainability Index, which is part of both the electricity and sustainability indexes in December 2023. The effects of the public notification were examined with the Case Study Method. Before and after 5 and 10 business days from the announcement date of stock closing data were examined. As a result of the analysis, it was concluded that there was an abnormally negative return for companies with the announcement of inclusion in the Sustainability Index.

Keywords: *Stock market performance, energy company, sustainability index, case study, Borsa Istanbul.*

Jel Classification: *E44, M21, F64, I10*

ÖZET

Borsa İstanbul'da İşlem Gören Enerji Şirketlerinin Borsa Performanslarının Sürdürülebilirlik Açısından Değerlendirilmesi

Bu çalışmada, şirketlerin sürdürülebilirlik endeksine dahil edileceğine dair duyurunun şirketlerin borsa performansı üzerinde bir etkisi olup olmadığı incelenmiştir. Araştırma, Aralık 2023'te Elektrik ve Sürdürülebilirlik Endekslerinin bir parçası olan Borsa İstanbul Sürdürülebilirlik Endeksi'ne dahil edilecek 9 Türk şirketinin duyurulmasının potansiyel etkisinin analizine odaklanmıştır. Kamuoyuna yapılan duyurunun etkileri Vaka Çalışması Yöntemi ile incelenmiştir. Duyuru tarihinden önce ve sonra 5 ve 10 iş günü olmak üzere borsa kapanış verileri incelenmiştir. Analiz sonucunda, Sürdürülebilirlik Endeksi'ne dahil edileceğine dair duyuru yapılan şirketlerde anormal bir negatif getiri olduğu sonucuna varılmıştır.

Anahtar Kelimeler: *Borsa performansı, enerji şirketi, sürdürülebilirlik endeksi, vaka analizi, Borsa Istanbul.*

JEL Sınıflandırması*:* E44, M21, F64, I10

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1. INTRODUCTION

Excessive consumption has spurred an urgent global search for renewable and environmentally friendly energy sources such as hydraulic, solar, biomass, wind, geothermal, and wave energy. This urgent search underscores the current state of the energy sector and the need for sustainable solutions. Growing international awareness of environmental issues has further accelerated this shift. Renewable energy is difficult to consume entirely because it is produced from natural resources and can be renewed quickly. The energy provided by the sun, for example, cannot be completely destroyed under normal conditions. It has an essential advantage because it is not exhausted like non-renewable energy (Bağcı and Yüksel, 2019: 877).

Since the need for energy in Turkey and the world is constantly increasing, investments in this field and the number of companies operating in the energy sector are also growing. Companies in this sector prefer to offer their shares to the public on Borsa Istanbul (BIST) to finance their investments in the energy field. Investors primarily look at the companies' financial performance when deciding which energy company to invest in this sector (Bağcı and Yüksel, 2019: 877).

Performance is an element that needs to be measured and evaluated in terms of companies which is carried out by companies with the evaluation of financial performance (Bağcı and Yüksel, 2019: 877). The companies that follow up can determine the situation of the company in the past years and their own situation by comparing it with other competitors in the sector. Although there are different performance measurement methods and criteria, financial performance is essential for companies.

The energy sector is costly and high-risk as it requires fixed capital investment. For this reason, companies in the energy field must be financially strong (Arsu, 2023: 35). Financial performance is a measure that shows whether companies use their assets and liabilities effectively. This performance can be measured with the help of financial ratios. Financial ratios provide information on a company's financial performance, the return and level of its investments, the level of risk, and how its resources are used and shed light on its future (Uygurtürk and Korkmaz, 2012: 95).

Due to the decrease in energy resources, the public has become more aware of energy and companies have become more cautious in their consumption of resources. In addition, it has affected the importance of the government to ensure that the policies it implements regarding the environment are in harmony with the environment (Sakarya et al., 2015:1) Due to this situation, not only the financial performance of the companies but also their environmental, social, and managerial performances have become important. The importance of sustainability, which corresponds to these concepts, is increasing every day and has become an important issue for companies.

As the company's policies in this area have started to gain importance for investors in listed companies, and in order to increase awareness and practice in this area, the BIST Sustainability Index was created by BIST on 4 November 2014, with the code XUSRD. Companies that meet the requirements of the index on environmental, social, and governance

issues have started to be traded in the index. As of December 2023, are 80 companies in the BIST Sustainability Index.

2. LITERATURE REVIEW

Sustainability enables companies to control environmental risks, economic risks and social negatives, to save money on the use of materials and to become financially strong. In addition, sustainability includes goals such as economic growth, environmental protection and meeting social needs in a broad sense, such as ensuring the development of the company in addition to the profit of the company in a narrow sense (Borsa Istanbul Sustainability Bulletin, 2016).

Different indicators can be used to measure stock market performance. These indicators include market capitalization, trading volume, comparison by BIST100 index, number of contracts, etc. Market capitalisation is generally taken as an indicator and measured by market capitalisation ratios. It provides information about the performance of the stock.

Below are some examples of studies that have examined the impact of being included in a sustainability index on a company's performance.

Yildirim et al. (2018), conducted a study on nine companies included in the BIST Sustainability Index, aimed to examine whether there was a significant change in the financial performance of these companies compared to the periods before they entered the index. The t-test method was used to measure the changes in the financial performance of the companies during the examined times. As a result, it was stated that there was an increase in their economic performance after the entry into the index.

The study by McGuire et al. (1988), examined the effect of the perception of corporate social responsibility on the stock market returns of companies that were not included in the sustainability index. The article analysed data from 133 companies between 1977 and 1984, based on corporate reputation data from Fortune magazine. As a result, it was determined that there was a positive relationship.

Consolandi et al. (2009), conducted a study on the status of European companies added and removed from the Dow Jones Sustainability Index in the five years between 2002 and 2006. They found positive abnormal returns in companies included in the index and negative abnormal returns in companies excluded from the index.

Lo and Sheu (2007) who study non-financial companies traded on the US stock exchanges, investigated the relationship between sustainability activities and the market values of these companies between 1999 and 2022. They found a non-negative relationship between sustainability and the market and that sustainability positively affects company sales.

Nakai et al. (2016), examined the changes in the stock value of Japanese companies between 2003 and 2010 by entering and exiting the Morningstar Sustainability Index. They determined that entering the index positively affected company market values while leaving the index had no significant impact.

In the study of Gök and Gökşen, the effect of the announcements of the inclusion of banks traded in the Borsa İstanbul Sustainability Index (XUSRD) in the index on stock returns was examined. The study included 8 banks and the Case Study method was used as the research method. As a result, it is indicated that the inclusion of banks in the XUSRD has a positive effect on investors (Gök and Gökşen, 2020).

In the study of Kılıç and Gökoğlan covering the years 2014-2020, it was examined whether the inclusion of 12 holding and investment companies in the sustainability index had any effect on stock returns. The Case Study method was used as the method and it was concluded that investors reacted positively and a return above the market return could be achieved (Kılıç and Gökoğlan, 2024).

Studies showing that it has a negative effect are given below.

Cheung and Roca (2013), who conducted a study on nine countries in the Asia-Pacific region, examined the companies included in the Dow Jones Global Sustainability Index between 2002 and 2010. The study found a non-positive change in the stocks included in and removed from the index.

Daszyńska-Żygadło et al. (2014) who worked with 33 companies included in the Polish RESPECTS Index between 2009 and 2012 and 107 companies included in the STOXX European Sustainability Index between 2005 and 2010, found that inclusion in the RESPECTS index did not cause a change in stock returns and had no effect. Still, inclusion in the STOXX European Sustainability Index had a negative impact.

Oberndorfer et al. (2013), conducted a study on German companies included in the Dow Jones Sustainability Index. They found that being included in the DJSI World Index did not positively affect stock values, and being included in the DJSI STOXX did not have a significant effect.

Konak and Türkoğlu's 2023 study examined whether being included in the Borsa İstanbul Sustainability Participation Index has an effect on stock returns. The Case Study method was used with the stock closing data of 23 companies included in the index and whose data could be accessed. As a result, it was concluded that the market was not semi-strongly efficient (Konak and Türkoğlu, 2023).

The studies that did not have a significant effect are given below:

In the study conducted by Temiz and Acar in 2018, 44 companies included in the BIST Sustainability Index were examined. Whether the announcement of being listed in the index had an effect on the stock returns of these companies was analyzed using the Case Study method, and as a result, limited evidence was reached that the announcement of starting to list caused an overreaction on stock returns (Temiz and Acar, 2018).

In the study conducted by Parlakkaya et al., 43 companies included in the BIST Sustainability Index between the years 2014, 2015 and 2016 were included in the study. It was examined whether being included in the index had any effect on stock returns. The Case Study

method was used during the examination and the event window was 5 days before and after. As a result, it was seen that there was no effect (Parlakkaya et al., 2019).

3. RESEARCH METHODOLOGY

Since publicly traded companies publish their financial data on the Public Disclosure Platform (PDP), this study took financial data from PDP. In the following parts of the study, this index and the companies within its scope will be detailed, and the stock market performances of the relevant companies will be analyzed.

The valuation study to be carried out by Vigeo EIRIS will take into account publicly available information on the companies as at 31 July 2020. As a result of this evaluation study, the companies that pass the thresholds of the index selection criteria will be included in the BIST Sustainability Index from December 2020 to October 2021.

The companies included in the index from December 2020 to October 2021 were announced in the announcement published by BIST on 26.11.2020. In this period, AGHOL, ANHYT, OUR, KRDMD and PGSUS were added to the index. As a result, the companies that will be included in the index on 1 December 2020 are shown in Table 1.

Table 1. The companies are traded in the Index on or after December 1, 2020.

1	Ak Energy	21	Eregli Iron & Steel	41	Sok Markets
2	Akbank	22	Ford Automotive	42	T Halk Bank
3	Aksa	23	Garanti Bank	43	TKSB
4	Aksa Energy	24	Global Investments Holding	44	Tat Food
5	Albaraka Turk	25	Is Bank	45	TAV Airport
6	Anadolu Group Holding	26	Iskenderun Iron & Steel	46	Tekfen Holding
7	Anadolu Efes	27	Kerevitas Food	47	Tofas
8	Anadolu Retirement	28	Koc Holding Company	48	Tupras
9	Anel Electricity	29	Kordsa Technic Textile	49	THY
10	Arcelik	30	Kardemir	50	Turk Telekom
11	Aselsan	31	Logo Software	51	Turk Tractor
12	Aygaz	32	Migros	52	Turkcell
13	Bizim Stores	33	Netas	53	Ulker
14	Brisa	34	Otokar	54	Vakiflar Bank
15	Cimsa	35	Petkim	55	Yapı ve Kredi Bank
16	Coca-Cola	36	Pegasus	56	Vestel
17	Dogan Holding Company	37	Polisan Holding Company	57	Vestel Beyaz Eşya
18	Dogus Automotive	38	Sabanci Holding Company	58	Zorlu Energy
19	Enerjisa	39	Sekerbank		
20	Enka Building	40	Bottle Glass		

Source: Borsa Istanbul. BIST Sustainability Index. 17 Aralık 2023

With the announcement published by BIST on 16.07.2021, the valuation methodology used in determining the companies to be included in the BIST Sustainability Index has been changed, and the sustainability valuation results of Refinitiv Information Limited Company (Refinitiv) will be used in determining the companies that will be included in the BIST

Sustainability Index as of 2021. In this context, the basic rules of the BIST Sustainability Index, dated December 2017, have been repealed. Companies will be evaluated voluntarily. Companies subject to a sustainability valuation must carefully answer relevant questions through Refinitiv's ESG Contributor Tool (https://contribute.refinitiv.com/) and enter links to their publicly available information. Sustainability ratings are generated approximately 6-8 weeks after data entry is complete. Companies will be able to track their data and sustainability ratings through the ESG Contributor Tool application to which they are logged in. In contrast to the old methodology, companies will be able to update the data used in the sustainability ratings throughout the year using Refinitiv's methodology.

To facilitate the transition to the new sustainability valuation methodology, the sustainability ratings of the companies currently included in the BIST Sustainability Index will remain unchanged until the end of June 2022. Refinitiv's valuation methodology is shown in Table 2.

Table 2. Refinitiv valuation methodology

Main Topic	Category	Theme
Environment	Emissions	Emissions
		Waste
		Biodiversity
		Environmental management systems
	Innovation	Innovation in products
		Green revenues, research and development, capital expenditures
	Sourcing	Water
		Energy
		Sustainable packaging
		Environmental supply chain
Corporate governance	Corporate social responsibility strategy	Corporate social responsibility strategy
		Sustainability (ESG) reporting and transparency
	Management	Management structure (independence, diversity, committees)
		Salary and payments
	Shareholders	Shareholders' rights
		Company takeovers
Social	Society	It is of equal importance for all sectors
	Human rights	Human rights
	Product liability	Responsible marketing
		Product Quality
		Data privacy
	Workforce	Diversity and inclusion
		Career development and training
		Operating conditions
		Health and safety

Source: Refinitiv's ESG Contributor Tool (https://contribute.refinitiv.com/)

Case Study is a method dating back to the 1930s. Dolley's first study on this method was in 1933. She examined whether there was any change in the nominal prices of the companies' stocks at the time of the split. An event study is an econometric technique that allows one to reach a conclusion and estimate the possible effects of the event in a specified period (Serra, 2004: 250). It was defined as the method used to understand the unusual reaction of the market to this event when the event occurs (Sakarya, 2011: 150). In addition to these explanations, it can also be defined as a method for measuring the change in the stock price of a company and an event associated with that company.

The case study aims to determine whether an event has generated a large return when it was first announced to the market. Excess returns are higher or lower than the average returns that would have been achieved had the news not been announced to the market. These returns are usually correlated with the performance of the overall market index return on the day of the event. It is a valuable technique because the effect of the relevant event is reflected in the company's stock return in a very short time (Sakarya and Sezgin, 2015:13).

The case study includes many models. Four stages are generally used for financial events: defining the event, defining the event window, evaluating the event's effects, setting up and testing the model, and evaluating the results (Tuominen, 2005:45)

If we adapt this model to our study, our event is "the announcement of the companies that will be included in the sustainability index", our realisation time is "the date on which the companies that will be included in the index are announced", our event window is "the period between 5 and 10 working days before and 5 and 10 working days after the announcement of the event". In the literature there are studies on short-term performance ranging from 1 day to 6 months. The long duration of the period chosen as the event window may reduce the statistical reliability of the study. If the duration of the period is short, the effects of the event in question can be better understood (Ersoy and Ünlü, 2008: 249)

This study examined whether the announcement of the inclusion of companies in the sustainability index had an effect on the stock market performance of the companies. The websites of PDP and BIST were used to provide the date information regarding the company entry announcements to the BIST XUSRD index. -5 and +5 and -10 and +10 business days from the announcement date to a total of 11 and 21 days of stock closing data were examined. Based on stock closing prices during this time period. Closing price data is taken from the official website of Is Investment Real-Estate Inc. (www.isyatirim.com.tr). The event window is chosen as -5 and -10 and +5 and +10 working days, as the sensitivity to the event is higher for a short period of time. It also minimises the impact of special or general events and news that may affect returns. This is believed to produce healthier results.

This method aims to determine whether the company has above-normal returns in the time frame when the market first reported the situation. This return, which we call abnormal stock return (ASR), is calculated by the formula:

First, *stock return (HG)* daily is calculated by the following equation:

$$HG_{ijt} = \frac{HF_{ijt} - HF_{ijt-1}}{HF_{ijt-1}}$$

HG ijt = Return of *i* stock on day *t* of year *j*

HF *ijt* = Adjusted closing price of *i* stock on day *t* of year *j*

HF *ijt*–1 = Adjusted closing price of *i* stock on day *t–1* of year *j*

Index Return (EG): To calculate the abnormal stock return (ASR) in our study, it will be necessary to calculate the index return as well as the return on shares:

$$EG_{jt} = \frac{E_{jt} - E_{jt-1}}{E_{jt-1}}$$

EG *jt* = Index return for day *t* of year *j*

E *jt* = Index figure for day *t of* year *j*

E *jt*–1 = Index figure for the year *j* on day *t–1*

After calculating the index return, under the assumption that fluctuations in the market are directly reflected in stock returns, *abnormal stock return (ASR)* is calculated with the following formula: ASR *ijt* = HG *ijt* – EG *jt*

ASR *ijt* = Abnormal return of *i* stock on day *t* of year *j*,

HG *ijt* = Return of *i* stock for day *t* of year *j*.

Although different return models are used instead of the market return, which we determine as the average return in equation (ASR *ijt*), the market return rate was used in our study, as in many previous studies, and BIST100 closing data were used to determine this rate (Bekçioğlu et al., 2004: 46).

For the event study, the average abnormal return (AAR) and the cumulative abnormal return (CAR) should be calculated on the days before and after the event date. At this point, the AAR and CAR can be calculated in a three-stage study, as shown in Figure 1.

It is calculated using the Abnormal Stock Return (ASR), which is the difference between the actual return and the market return for each 't' day of each 'i' company subject to the application. The average abnormal return (AAR) is then calculated by dividing each abnormal return obtained by the number of companies covered by the request:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{i,t}$$

Finally, the average abnormal returns over the *t* days in the event window (i.e. overall times *t*) were summed to form the cumulative average abnormal return (*CAR*):

$$CAR_T = \sum_{t=1}^{T} AAR_t$$

The *CAR* is a functional statistical analysis besides the AAR because it helps us understand the aggregate effect of the abnormal returns. In particular, the CAR can be very useful when the impact of the event during the event window is not limited to the date of the event itself.

In statistical terms, if the result of the mathematical operations is not equal to zero, we can say that the event in question affects the stock return. In our study, if the CAR value in equation 5 is different from 0, it can be inferred that the stocks are affected, and there may be abnormal positive/negative returns with the relevant event. If this value is equal to or extremely close to 0, it is concluded that the event in question is ineffective (Bekçioğlu vd., 2004:46)

We can form our hypotheses about the study as follows:

H_0 Hypothesis: The cumulative average abnormal returns of stocks in the days around the announcement of the announcements regarding the inclusion of companies in the BIST Sustainability Index are equal to 0. **CAR=0**

H_1 Hypothesis: The cumulative average abnormal returns of stocks on the days around the announcement date of the announcement of the companies' inclusion in the BIST Sustainability Index are different from 0. **CAR ≠0**

4. RESULTS

The actual return rates and market return rates were calculated first 5 days before and 5 days after, and then within 10 days before and 10 days after the announcement dates of the inclusion of 9 companies (AKENR, AKSEN, AYDEM, ENJSA, ESEN, GWIND, MAGEN, NATEN and ZOREN) in the BIST Sustainability Index in the BIST Sustainability Index, and abnormal return (AR_{it}) was found using these rates. Table 3 gives the dates these companies were announced to be included in the BIST Sustainability Index.

Table 3. Dates when companies are announced to be included in the BIST Sustainability Index

NO	BIST CODE	FIRM NAME	BIST XUSRD ENTRY DATE
1	AKENR	Ak Energy Electricity Generation JSC	October 27, 2017
2	AKSEN	Aksa Energy Generation JSC	October 23, 2015

3	AYDEM	Aydem Renewable Energy JSC	June 16, 2023
4	ENJSA	Enerjisa Energy JSC	October 25, 2019
5	ESEN	Esenboga Electricity Generation Energy JSC	March 16, 2023
6	GWIND	Galata Wind Energy JSC	December 19, 2022
7	MAGEN	Margun Energy Production Industry Energy JSC	March 16, 2023
8	NATEN	Naturel Renewable Energy Energy JSC	March 16, 2023
9	ZOREN	Zorlu Energy Electricity Generation Energy JSC	October 25, 2016

Source: Borsa Istanbul. BIST Sustainability Index. 17 Aralık 2023, Erişim Tarihi: 10.02.2024

Those companies included in the BIST Sustainability Index at different times have non-zero cumulative average returns within the period 5 days before and 5 days after the event date (Table 10). According to the results obtained, the cumulative returns before the event date are generally different from zero in a positive sense, and the cumulative returns after the day of the event are different from zero in a negative sense. When the situation was evaluated, it was concluded that investors reacted negatively to the announcement of companies' inclusion in the sustainability index and that there were abnormal negative returns.

Table 4. Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CARs) of companies included in the BIST Sustainability Index (t-5 and t+5)

Event Date	AKENR	AKSEN	AYDEM	ENJSA	ESEN	GWIND	MAGEN	NATEN	ZOREN	Average Abnormal Return	Cumulative Average Abnormal Return
Day	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	AARit(%)	CARit(%)
t - 5	-0,09	1,01	-0,73	1,50	0,66	-3,11	4,70	3,09	-1,16	0,65	0,65
t - 4	0,03	-1,53	7,96	1,57	0,44	-2,20	1,42	0,26	0,20	0,91	1,56
t - 3	-0,99	-0,01	-2,95	-1,73	1,77	-1,41	2,21	1,28	-0,13	-0,22	1,34
t - 2	-0,02	-0,86	-1,55	-1,26	-3,84	-1,54	-0,96	-4,14	0,63	-1,50	-0,16
t - 1	-0,07	-0,63	-1,71	2,86	-0,79	3,97	4,34	0,71	-0,06	0,96	0,79
t= 0	-0,56	-1,25	-0,42	-2,50	3,25	-1,94	-0,38	4,30	-0,69	-0,02	0,77
t + 1	-0,56	-2,05	-0,06	0,18	-0,68	-2,77	-0,72	-0,76	-1,33	-0,97	-0,20
t + 2	-0,38	-0,03	-0,13	0,21	-0,26	-1,67	1,62	-0,84	2,23	0,08	-0,12
t + 3	-1,55	-1,33	-0,04	1,10	-2,07	-2,11	-1,33	-1,44	-0,83	-1,07	-1,18
t + 4	0,00	-0,34	-1,82	-0,89	-0,59	-0,55	2,44	0,16	-0,26	-0,21	-1,39
t + 5	-1,72	0,98	1,38	-0,72	-1,50	-1,40	-2,81	-2,45	-1,30	-1,06	-2,45

The graph in Figure 1 shows that investors received the announcement of companies' inclusion in the BIST Sustainability Index negatively. The companies' stock returns are negatively sensitive to this event.

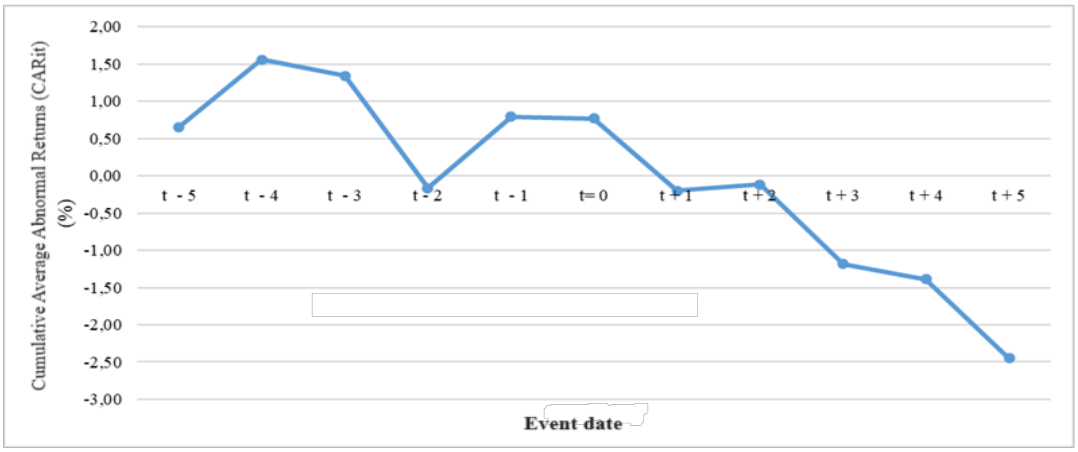

Figure 1. Sensitivity of Cumulative Average Abnormal Returns to event date (t-5 and t+5)

As seen in Table 11, the companies included in the BIST Sustainability Index at different times have non-zero cumulative average returns within the period 10 days before and 10 days after the event date. According to the results obtained, the cumulative returns before the date of the event and the cumulative returns after the day of the event are negatively different from zero. When the situation was evaluated, it was concluded that investors reacted negatively to the announcement of companies' inclusion in the sustainability index and that there were abnormal negative returns.

Table 5. Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CARs) of companies included in the BIST Sustainability Index (t-10 and t+10)

Event Date	AKENR	AKSEN	AYDEM	ENJSA	ESEN	GWIND	MAGEN	NATEN	ZOREN	Average Abnormal Return	Cumulative Average Abnormal Return
Day	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	ARit (%)	AARit(%)	CARit(%)
t - 10	-1,36	0,86	-2,69	-2,26	0,68	-3,07	1,32	1,43	-1,06	-0,68	-0,68
t - 9	-0,28	-1,60	-2,15	1,08	-2,23	4,34	0,93	2,13	2,80	0,56	-0,12
t - 8	0,62	-2,60	-2,27	-0,90	2,00	-0,31	-2,74	6,51	-2,99	-0,30	-0,42
t - 7	0,09	0,27	-1,40	0,77	-2,31	-2,63	0,03	-9,71	-1,04	-1,77	-2,19
t - 6	-1,40	-0,64	-0,93	-2,07	-2,50	-1,57	-1,44	-3,92	0,26	-1,58	-3,77
t - 5	-0,09	1,01	-0,73	1,48	0,66	-3,11	4,70	3,09	-1,16	0,65	-3,12
t - 4	0,03	-1,53	7,96	1,82	0,44	-2,20	1,42	0,26	0,20	0,93	-2,18
t - 3	-0,99	0,02	-2,95	-1,78	1,77	-1,41	2,21	1,28	-0,13	-0,22	-2,40
t - 2	-0,02	-0,90	-1,55	-1,47	-3,84	-1,54	-0,96	-4,14	0,63	-1,53	-3,94
t - 1	-0,07	0,15	-1,71	3,01	-0,79	3,97	4,34	0,71	-0,06	1,06	-2,88
t= 0	-0,56	-1,29	-0,42	-2,39	3,25	-1,94	-0,38	4,30	-0,69	-0,01	-2,89
t + 1	-0,56	-2,13	-0,06	0,17	-0,68	-2,77	-0,72	-0,76	-1,33	-0,98	-3,87
t + 2	-0,38	-0,86	-0,13	0,17	-0,26	-1,67	1,62	-0,84	2,23	-0,01	-3,88
t + 3	-1,55	-0,57	-0,04	1,14	-2,07	-2,11	-1,33	-1,44	-0,83	-0,98	-4,86
t + 4	0,00	-1,15	-1,82	-0,93	-0,59	-0,55	2,44	0,16	-0,26	-0,30	-5,16
t + 5	-1,72	1,20	1,38	-0,92	-1,50	-1,40	-2,81	-2,45	-1,30	-1,06	-6,22
t + 6	-2,61	3,28	0,66	-0,87	0,80	0,20	0,67	3,09	1,65	0,76	-5,45
t + 7	0,55	-0,21	2,44	1,28	1,85	-0,12	-1,33	-0,47	0,65	0,52	-4,94
t + 8	0,36	-0,67	0,72	1,53	-1,10	0,14	0,83	-1,29	-0,98	-0,05	-4,99
t + 9	0,40	2,09	-1,35	-1,92	-4,25	-1,96	-4,28	-4,65	-0,46	-1,82	-6,81
t + 10	0,04	0,51	3,07	-0,58	-0,80	0,03	0,79	-1,34	0,48	0,25	-6,56

The graph in Figure 2 shows that investors received the announcement of companies' inclusion in the BIST Sustainability Index negatively. The companies' stock returns are negatively sensitive to this event.

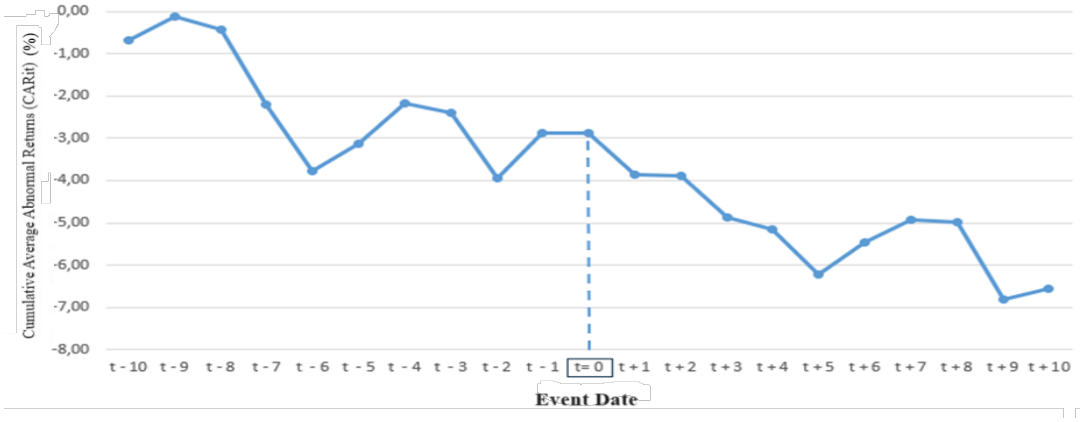

Figure 2. Sensitivity of Cumulative Average Abnormal Returns to event date (t-10 and t+10)

Sustainability, which measures the importance of a company's environmental, social and governance policies, would be expected to have a positive impact on companies. However, as can be seen in Figures 22 and 23, the opposite is the case. When we look at the studies on this subject in the literature, we see that the inclusion of companies in the Sustainability Index is for companies. There are studies with a positive, negative, or no effect at all. This study is similar in terms of results to the studies of Cheung and Roca, Daszyńska-Żygadło, and Oberndorfer et al., which are mentioned in the literature review section.

5. CONCLUSIONS AND RECOMMENDATIONS

The impact of the public announcement of the inclusion of 9 companies in the BIST Sustainability Index (XUSRD) on the stock returns of these companies was examined using the case study method. The closing prices of the companies' shares and the closing prices of the BİST100 Index were used in the 11- and 21-day periods, which include 5 days before and 5 days after the announcement dates of the companies' inclusion in the index and 10 days before and 10 days after, to measure whether there was an abnormal return.

As a result of the analysis, it was concluded that there was an abnormal negative return in the companies with the notification of the companies entering the BIST XUSRD index. According to the efficient markets' hypothesis, for a market to be effective, the information about the companies that are disclosed to the public must not have an abnormal effect on the stock returns of those companies. If there is an abnormal rise or fall in stock returns with the announcement of information about the company, the market is not active, even in semi-strong form. In the study, we can see an abnormal decline in the stock returns of companies with the disclosure of companies' inclusion in the index. This means that the market is not active even in semi-strong form.

Since the Cumulative Average Abnormal Returns (CARit) are different from zero in the period following the event, the H0 hypothesis (CAR=0), which states that the event had no effect, is rejected. The alternative hypothesis, H1 (CAR ≠0), which states that the event could have a positive or negative effect on stock returns, is accepted. In other words, it is concluded that the market in our country is not effective in a semi-strong form, and there may be abnormal negative returns with the information disclosed to the public.

When we examine the analyses together, the calculation of the financial performance of the companies through the financial data they disclose gives more objective results. It seems healthier in terms of investment in companies. However, financial performance alone is not enough to invest in companies today. There are also other factors at play, such as the concept of sustainability, which shows the importance of the policies that companies pursue on environmental, corporate and social issues. When we examine the effect of sustainability on investment in companies, we see that it has a negative effect rather than a positive effect as a result of the analysis when we look at it within the framework of the sample we received. There can be many reasons why a positive element for companies and investors can have a negative impact on investment. These include; Reasons such as the fact that investors think that the inclusion of companies in the sustainability index may reduce profitability in the short term as it will create additional costs for companies, investors do not have enough information about sustainability, sustainability is not an issue worth considering by investors, or it is too early to examine this issue.

In order to be included in the BIST Sustainability Index, companies must have a valid score based on Refinitiv's scoring methodology, which consists of three sections: Environmental, Corporate Governance and Social. However, since sustainability is a long-term process, companies must have sufficient financial strength to realize and maintain the conditions in the relevant methodology. Therefore, "Financial" should be added to the main heading of the appropriate table, and criteria should be added to measure whether companies have the financial performance to make and maintain sustainability-related investments. These criteria may vary from sector to sector. For example, in this study on energy companies, the five most important financial ratios selected as financial performance criteria can be used as performance criteria: turnover of assets, short-term external funds/total assets, financial expenses/net sales, turnover of receivables and financing ratio.

In the study conducted; taking 9 companies included in both Borsa İstanbul Electricity Index (XELKT) and BIST Sustainability Index (XUSRD) as a sample, examining 5 and 10-day time periods as event windows constitute the limitations of our study. This study, which differs from other studies in terms of examining only energy companies recently included in the Sustainability Index as a sample, and using 5 and 10-day time periods as event windows, contributes to understanding how publicly disclosed information about publicly traded companies is evaluated by investors and its impact on the investment decision process. Future studies can also obtain different results by changing the relevant event subject, choosing a longer or shorter period, comparing it with studies conducted in other countries, or applying the same method. As awareness of the BIST Sustainability Index and sustainability increases, different results can be obtained.

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