HİTİT SOSYAL BİLİMLER DERGİSİ
Hitit Journal of Social Sciences

e-ISSN: 2757-7949
Cilt | Volume: 17 • Sayı | Number: 1
Nisan | April 2024

Evaluation of the Sustainability Messages of the Companies with the Highest BIST Sustainability Index on X (Twitter) Platform

BIST Sürdürülebilirlik Endeksi En Yüksek Şirketlerin X Platformundaki (Twitter) Sürdürülebilirlik İletilerinin Değerlendirilmesi

Vildan GÜLPINAR DEMİRCİ
Corresponding Author | Sorumlu Yazar
Doç. Dr. | Assoc. Prof.
Aksaray Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, İktisat Bölümü, Aksaray, Türkiye
Aksaray University, Faculty of Economics and Administration Sciences, Department of Economics, Aksaray, Türkiye
vildangulpinar@aksaray.edu.tr
https://orcid.org/0000-0002-8824-5154

Başak BULUZ KÖMEÇOĞLU
Araş. Gör. | Res. Asst.
Gebze Teknik Üniversitesi, Bilişim Teknolojileri Enstitüsü, Kocaeli, Türkiye
Gebze Teknik University, Institute of Information Technologies, Kocaeli, Türkiye
bbluz@gtu.edu.tr
https://orcid.org/ 0000-0001-9937-1036

Makale Bilgisi | Article Information

Makale Türü | Article Type: Araştırma Makalesi | Research Article
Geliş Tarihi | Received: 15.01.2024
Kabul Tarihi | Accepted: 30.04.2024
Yayın Tarihi | Published: 30.04.2024

Atıf | Cite As

Gülpınar Demirci, V., & Buluz Kömeçoğlu, B. (2024). Evaluation of the Sustainability Messages of the Companies with the Highest BIST Sustainability Index on X Platform. *Hitit Sosyal Bilimler Dergisi*, *17*(1), 134-151. https://doi.org/10.17218/hititsbd.1420030

Yazar Katkıları: %50-%50
Değerlendirme: Bu makalenin ön incelemesi iki iç hakem (editörler - yayın kurulu üyeleri) içerik incelemesi ise iki dış hakem tarafından çift taraflı kör hakemlik modeliyle incelendi. Benzerlik taraması yapılarak (Turnitin) intihal içermediği teyit edildi.
Etik Beyan: Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.
Etik Bildirim: husbededitor@hitit.edu.tr https://dergipark.org.tr/tr/pub/hititsbd
Çıkar Çatışması: Çıkar çatışması beyan edilmemiştir.
Finansman: Bu araştırmayı desteklemek için dış fon kullanılmamıştır.

Author Contributions: 50%-50%
Review: Single anonymized - Two Internal (Editorial board members) and Double anonymized - Two External Double-blind Peer Review
It was confirmed that it did not contain plagiarism by similarity scanning (Turnitin).
Ethical Statement: It is declared that scientific and ethical principles have been followed while conducting and writing this study and that all the sources used have been properly cited.
Complaints: husbededitor@hitit.edu.tr - https://dergipark.org.tr/tr/pub/hititsbd
Conflicts of Interest: The author(s) has no conflict of interest to declare.
Grant Support: The author(s) acknowledge that they received no external funding to support this research.

Evaluation of the Sustainability Messages of the Companies with the Highest BIST Sustainability Index on X (Twitter) Platform

Abstract

BIST Sustainability Index was created to increase the understanding, knowledge, and practices on sustainability among Borsa Istanbul companies in Turkey. The BIST Sustainability Index aims to guide companies in the process of establishing policies regarding the environmental, social, and corporate governance risks of stock exchanges. In addition, it has the mission of creating a platform that communicates information on companies' sustainability policies to responsible investors. In line with the United Nations Sustainability Development Goals, several metrics are presented according to the sustainability practices of companies in Borsa Istanbul. Social networks are a tool that businesses frequently use to disseminate information quickly and at low cost. It has a key role in disseminating information about social marketing activities, especially in the sustainability axis. This study focuses on how companies use social networks to disseminate sustainability information. For this purpose, the sustainability messages of the 12 companies with the highest scores in the BIST sustainability index on the social network X platform for the years 2014-2022 are analyzed. The aim of the study is to examine whether there is a relationship between the companies' BIST sustainability index scores and the intensity of their use of sustainability messages on the social network. X platform data was obtained with the Python programming language, twint library. The correlation test was carried out using the SPSS package program with the Spearman Correlation test. As a result of the research, it is seen that the most frequently used keywords/phrase groups in the posts made by all companies are "education, energy, climate, women, health, water, sustainable, wages, production". The study did not find a significant relationship between the BIST sustainability index scores and the intensity of companies' messages containing sustainability keywords on the platform. This shows that companies should use social networks more efficiently in the dissemination of sustainability activities. Knowing how companies use social media to disseminate sustainability information can provide guidance for other companies. On the other hand, within the scope of the research, the messages of the companies were analyzed and the sustainability keywords were divided into three themes. The first theme is health, education, and women; the second theme is climate and environment; and the third theme is energy and savings. These themes and keywords are expected to serve as a source for content analysis studies such as social media messages and sustainability reports. Although no similar study has been found in Turkey, this study is one of the rare studies in the world literature. Unlike the literature, the sustainability activities on social media of the companies ranked at the top of the BIST Sustainability Index are analyzed. Thus, the activities carried out by companies that have already been determined to be successful in sustainability activities with a metric will serve as an example for companies that are not included in this list. On the other hand, the themes obtained from the research can be utilized in the dissemination of sustainability information on social media.

Keywords: Sustainability, BIST Sustainability Index, X Platform, Social Media Analysis, Sustainability Keywords

BIST Sürdürülebilirlik Endeksi En Yüksek Şirketlerin X Platformundaki (Twitter) Sürdürülebilirlik İletilerinin Değerlendirilmesi

Öz

BIST Sürdürülebilirlik Endeksi, Türkiye'de Borsa İstanbul şirketleri arasında sürdürülebilirlik konusundaki anlayış, bilgi ve uygulamaları artırmak amacıyla oluşturulmuştur. BIST Sürdürülebilirlik Endeksi, borsaların çevresel, sosyal ve kurumsal yönetim risklerine ilişkin politika oluşturma sürecinde şirketlere yol göstermeyi amaçlamaktadır. Ayrıca, şirketlerin sürdürülebilirlik politikalarına ilişkin bilgileri sorumlu taraflara ileten bir platform oluşturma misyonuna sahiptir. Birleşmiş Milletler Sürdürülebilirlik Kalkınma Hedefleri ile uyumlu olmak üzere Borsa İstanbul'daki şirketlerin sürdürülebilirlik uygulamalarına göre bir takım metrikler sunulmaktadır. Sosyal ağlar ise, işletmelerin bilgiyi hızlı ve düşük maliyetle yaymak amacıyla sıklıkla kullandıkları bir araç konumundadır. Özellikle sürdürülebilirlik ekseninde sosyal pazarlama faaliyetleri hakkındaki bilginin yayılması konusunda anahtar bir role sahiptir. Bu çalışma, şirketlerin sürdürülebilirlik bilgilerini yaymak için sosyal ağları nasıl kullandıklarına odaklanmaktadır. Bu amaçla, BIST sürdürülebilirlik endeksinde en yüksek puana sahip 12 şirketin 2014-2022 yılları arasında X platformunda sosyal ağındaki sürdürülebilirlik mesajları analiz edilmiştir. Çalışmanın amacı, şirketlerin BIST sürdürülebilirlik endeksi puanları ile sosyal ağdaki sürdürülebilirlik iletilerinin kullanım yoğunlukları arasında bir ilişki olup olmadığını incelemektir. X verileri Python programlama dili, twint kütüphanesi ile elde edilmiştir. İlişkililik testi ise Spearman Korelasyon testi ile SPSS paket programı kullanılarak gerçekleştirilmiştir. Araştırma sonucunda tüm şirketler tarafından yapılan paylaşımlarda en sık kullanılan anahtar kelime/ifade gruplarının "eğitim, enerji, iklim, kadın, sağlık, su, sürdürülebilir, ücret, üretim" olduğu görülüyor. Çalışma sonucunda, BIST sürdürülebilirlik endeksi puanları ile şirketlerin X platformunda sürdürülebilirlik anahtar kelimeleri içeren iletilerinin yoğunluğu arasında anlamlı bir ilişki bulunamamıştır. Bu durum, şirketlerin sürdürülebilirlik faaliyetlerinin yaygınlaştırılmasında sosyal ağları daha etkin

kullanmaları gerektiğini göstermektedir. Şirketlerin sürdürülebilirlik bilgisini yayma konusunda sosyal medyayı nasıl kullandıklarının bilinmesi, diğer şirketler için de yol gösterici olabilecektir. Öte yandan araştırma kapsamında şirketlerin mesajları analiz edilmiş ve sürdürülebilirlik anahtar kelimeleri üç temaya ayrılmıştır. Birinci tema sağlık, eğitim ve kadın; ikinci tema iklim ve çevre; üçüncü tema ise enerji ve tasarruf olarak belirlenmiştir. Bu tema ve anahtar kelimelerin sosyal medya mesajları ve sürdürülebilirlik raporları gibi içerik analizi çalışmalarına kaynak etmesi beklenmektedir. Türkiye'de benzer bir çalışmaya rastlanmamış olmakla birlikte, bu çalışma dünya literatüründeki nadir çalışmalardan biridir. Literatürden farklı olarak BIST Sürdürülebilirlik Endeksi sıralamasında en üst sırada yer alan şirketlerin sosyal medyadaki sürdürülebilirlik faaliyetleri incelenmiştir. Böylece hali hazırda sürdürülebilirlik faaliyetlerinde başarılı oldukları bir metrik ile belirlenmiş şirketlerin yürüttükleri faaliyetler, bu listede yer almayan şirketler için de örnek teşkil edecektir. Diğer taraftan sürdürülebilirlik bilgisinin sosyal medyada yayılmasında araştırmadan elde edilen temalardan yararlanılabilecektir.

Anahtar Kelimeler: Sürdürülebilirlik, BIST Sürdürülebilirlik Endeksi, X Platformu, Sosyal Medya Analizi, Sürdürülebilirlik Anahtar Kelimeleri

Introduction

The concepts of sustainability and social marketing are frequently used together both in academia and in the advanced strategies of corporations. Unlike product promotion, information dissemination is a relatively new area of research. Marketing strategies for new products aim to raise public awareness and subsequently increase product sales. In this respect, new knowledge diffusion is similar to new product promotion (Huang et al., 2019, p.65).

Kotler and Zaltma (1971) defined social marketing as follows: "Social marketing is the design, implementation, and control of programs calculated to influence the acceptability of social ideas and involving considerations of product planning, pricing, communication, distribution, and marketing research" (p.5). Corporate sustainability, on the other hand, is the adaptation of economic, environmental, and social factors to corporate activities and decision-making mechanisms together with corporate governance principles and the management of risks that may arise from these issues to create long-term value in companies ("Borsa İstanbul", t.y.).

Social media applications such as wikis, Facebook, and X platform (Twitter) allow for the rapid accumulation, storage, and dissemination of information, providing organizations with a low-cost and dynamic structure that they cannot achieve with traditional knowledge management techniques (Murphy & Salomone, 2013, p.76). Sustainability knowledge dissemination through social networking sites is a potentially cost-effective way to reach a large audience motivated to seek information and advice about sustainable communities (Huang et al., 2019, p.66).

It is a common practice in the literature to expand the research area to social marketing by examining the role of X platform (Twitter) social network platform in sustainability knowledge dissemination (Huang et al., 2019, pp.64-75). This research starts from the point that social media can be used for sustainability practices of social marketing from a broad perspective and aims to spread awareness and information to the target audience through sustainability practices by using data analysis methods obtained through social media. Unlike the studies in the literature, this study focuses on the sustainability messages on the official X platform accounts of the companies with the highest scores in the BIST sustainability index. The focus is on how X platform can be used as a social marketing tool in the field of sustainability and what its impact will be. The aim is to serve as a resource for how companies can use social media tools as a social marketing tool to disseminate information on sustainability.

In this study, the messages of 12 companies with the highest score in the BIST sustainability index according to 2022 data, which contain keywords related to sustainability on X platform, were analyzed. The year 2014, when the BIST sustainability index was calculated, was taken as a base, and all messages of the companies since 01.01.2014 were included in the analysis. Thus, the role of X

platform in the dissemination of sustainability information was tried to be revealed, and on the other hand, it was tried to determine whether there is a relationship between the sustainability index ranking and the intensity of information dissemination on social media. The study also tried to determine the frequency of the use of sustainability-related keywords together and from this point of view, 3 themes were identified. The keywords were compiled from Tsalis et al. (2020) and Roca & Searcy (2012) and adapted into Turkish.

1. Preliminaries

1.1. Sustainability

In 1987, with the Brundtland Report prepared by the United Nations World Commission on Environment and Development, the concepts of "sustainability" and subsequently "sustainable development" were defined for the first time in an official document and the economic, environmental, and social dimensions were evaluated from a holistic perspective in the light of the common problems of the whole world (Aksoylu and Taşdemir, 2020, p.96; Ozmehmet, 2008, p.5-6). To create long-term value in companies, adapting this holistic perspective to company activities and decision-making mechanisms together with corporate governance principles and managing the risks that may arise from these issues is defined as "corporate sustainability" (“Borsa İstanbul”, t.y.). Internalization of the concept of sustainability in all decision mechanisms and managerial activities in enterprises with corporate identity is only possible if it is observable and measurable (Şahin et al., 2018, p.2). This observation and measurement is ensured by transparent reporting of economic, environmental, and social activities, and performances of enterprises within the framework of standards. For corporate enterprises, which are of great importance for sustainable development, this reporting is an indicator of the awareness of being transparent to both internal and external stakeholders and having a sense of responsibility towards them (Aracı et al., 2016, p.3-4). In Turkey and many other countries, sustainability reporting is not a legal obligation, but a voluntary practice (Ertan, 2018, p.472).

In 2015, the United Nations (UN) member states adopted the "2030 Agenda for Sustainable Development". The aim of this agenda is to provide a common blueprint for peace and prosperity now and in the future for both people and the planet as a whole. The agenda includes 17 Sustainable Development Goals (SDGs) as urgent calls for action. In essence, they aim to combat climate change, protect oceans and forests, eradicate poverty, tackle all deprivations, improve health and education, and eliminate all forms of inequality, especially gender and economic inequality. The Department of Sustainable Development Goals (DSDG), established within the UN Department of Economic and Social Affairs (UNDESA), provides support to contribute to the realization of the set goals. Global Sustainable Development Reports (GSDRs), which have been prepared by the UN every 4 years since 2016, are also published to facilitate the follow-up of the process and to bring together scattered information and assessments (“United Nation, GSDR”, t.y.).

1.1.1. UN Sustainable Development Goals

Sustainability development goals primarily include ending all forms of poverty everywhere in the world. Food security, sustainable agriculture, and good nutrition are the sub-headings under which the solution to the problem of hunger is emphasized. In addition, health, quality education, gender equality, and eliminating inequalities between countries are the main topics. In addition, it is aimed to ensure the sustainability of clean water resources, sustainable energy, economy, industrial innovation, sustainable consumption, and production models. Sustainable cities, combating climate change, and ensuring the sustainability of underwater life and terrestrial ecosystems can be listed as other goals.

Within the scope of the research topic, the sub-items of the "sustainable economy" title of the UN Sustainable Development Goals are examined below. Accordingly, the main headings are sustaining per capita economic growth of at least 7 percent per year in the least developed countries by national conditions, technological innovation, and sector diversification to sustain economic productivity,

improving global resource efficiency in consumption and production by 2030, and ensuring full and productive employment and wage equality for all women and men, including disadvantaged groups. In addition, ending forced labor, child labor, and human trafficking and ensuring safe working environments for all workers, especially women migrant workers, developing sustainable tourism policies, and strengthening local financial institutions are among the issues underlined (“United Nation, SDGS”, t.y.).

1.1.2. BIST Sustainability Index

BIST Sustainability Index and BIST Sustainability 25 Indices, which were created as of 21 November 2022, were created with the aim of increasing the understanding, knowledge and practices on sustainability among Borsa Istanbul companies in Turkey. The BIST Sustainability Index aims to guide companies in the process of establishing policies regarding the environmental, social, and corporate governance risks of stock exchanges. In addition, it has the mission of creating a platform that communicates information on companies' sustainability policies to responsible investors. Starting from the 2021 valuations, Refinitiv's sustainability valuation results are used to determine the companies to be included in the BIST Sustainability Index. Only "publicly available" information is taken into account in the valuations. For a company to be included in the BIST Sustainability Index, its overall sustainability rating must be at least 50, its rating for each main heading must be at least 40, and at least 8 of the category ratings must be at least 26 ("Borsa Istanbul", n.d.). The Sustainability Valuation Results reported by Refinitiv are based on the score called ESG (Environmental, Social and Governance). This score is designed to measure a company's sustainability performance in 10 sub-themes under 3 main headings listed below, utilizing publicly available and verifiable data of the companies.

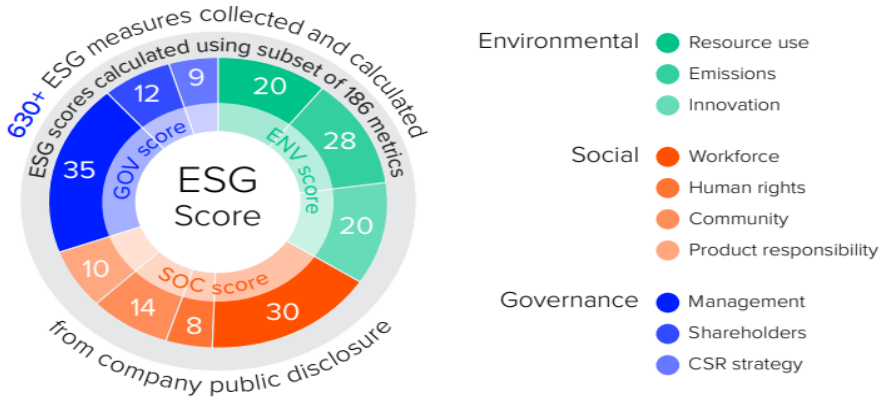
1. Environmental: Resource use, Emissions, Innovation

2. Social: Workforce, Human rights, Community, Product responsibility

3. Governance: Management, Shareholders, Corporate Social Responsibility Strategy (CSR Strategy)

In the calculation of the ESG score, more than 630 metrics of the company are calculated. However, the differentiation of the sectors in which companies are included within the service area is a factor that makes comparability and overall company evaluation difficult. For this reason, a subset containing 186 discrete metrics, which are the most comparable and important per sector, was determined, the distribution of which is shown in Figure 1 according to 10 sub-themes.

Figure 1. Distribution of 10 Sub-sets of ESG Measurement Metrics by Sub-theme



ESG score is measured with a 3-column calculation (environmental, social, and governance). It is a relative sum of category weights that vary according to the sector in which each company is located. While category weights varying by sector are used for environmental and social categories, weights

for governance are the same across all sectors. The BIST Sustainability Index, which belongs to companies traded on Borsa Istanbul, provides an independent and concrete evaluation and registration of the approaches of companies operating in certain business lines towards sustainability issues, which are of great importance both locally and globally, and the extent to which they include these issues in the activities they carry out and the managerial decisions they take. With this concrete assessment tool, which is presented as a valuable performance criterion for companies in the local and global market, it is envisaged that companies that present their responsibility not only for the present but also for the future with a transparent and accountable perspective will increase their reputation in the eyes of the public ("Borsa İstanbul", t.y.).

In order to be included in the BIST Sustainability Index, companies must fulfill the following characteristics: Overall Sustainability Score of 50 or above, each main topic is graded 40 or above and at least 8 of the category grades must be 26 or above.

The BIST Sustainability 25 Index, which started to be published on 21 November 2022, aims to create an index consisting of large and liquid companies with high sustainability performance.

Shares to be included in the BIST Sustainability 25 Index: Overall Sustainability Score of 70 or above, each main topic is graded 60 or above, the 25 stocks with the highest trading volume and market capitalization are selected among the stocks of companies with at least 8 of the category grades of 50 or above.

The index is determined by selecting the 25 stocks with the highest Trading Volume and Market Capitalisation among the stocks of companies with at least 8 of the category scores of 50 or above. With the launch of the index, companies that can effectively manage their corporate risks and opportunities are provided with a competitive advantage, while our capital market is provided with an index on which new investment products can be developed to enable companies to attract new capital and obtain financing under favorable conditions.

The Index reveals how companies approach issues related to sustainability that are important for Turkey and the world, such as global warming, depletion of natural resources, depletion of water resources, health, safety and employment, and ensures that their activities and decisions are evaluated and, in a sense, registered with an independent eye. The Index enables companies to compare their corporate sustainability performance locally and globally. The Index also provides companies with a performance evaluation tool to make improvements and set new targets, and enables them to improve their corporate transparency, accountability, and risk management skills in sustainability issues. It is believed that this will create a competitive opportunity for companies and that the public recognition and reputation of the companies included in the index will increase.

The introduction of the BIST Sustainability 25 Index provides a new tool for investors to identify and invest in companies that adopt sustainability and corporate social responsibility principles, and a new alternative indicator for asset managers to issue various financial products such as funds, exchange-traded funds and structured products based on sustainability principles. Today, the majority of responsible investments are made by institutional investors. Sustainability indices will encourage the establishment of funds investing in this area and facilitate the companies included in the indices to obtain shares from such funds.

2. Literature Review

Sustainability research has recently become widespread. Below are some important studies that utilize sustainability and the BIST Sustainability Index.

In their study, Çıtak and Ersoy (2016) tried to determine the investor reaction to the companies included in the BIST Sustainability Index. In the study, the average rates of return of the companies

included in the sustainability index and those not included in the sustainability index were compared. Although no significant difference was found between the two groups, the market capitalization to book value ratio was found to be higher for companies included in the sustainability index.

Akyüz and Yeşil (2017) examined the financial performance of companies included in the BIST sustainability index. Within the scope of the research, the corporate governance compliance ratings of 19 companies, whose data for the years 2011-2015 were evaluated, and prepared by rating agencies were taken into consideration.

Hızarcı Payne and Kerkulak Uludağ (2018) examined the sustainable business models of sustainability-oriented leading companies in the BIST sustainability index. The study focuses on how companies in Turkey adopt sustainable business models.

Aytekin and Erol (2018) investigated whether financial performance is a sufficient indicator to be included in the sustainability index. For this purpose, BIST 30 companies subjected to valuation for the period November 2014-October 2015, BIST 50 companies subjected to valuation for the period November 2015-October 2016, and 63 companies subjected to valuation for the period November 2016-October 2017 were determined as the sample of the study. The financial performances of the companies in the sample, excluding financial institutions, were analyzed using 10 financial ratios (Working Capital Turnover Ratio, Fixed Asset Turnover Ratio, Net Profit Margin, Return on Equity, Return on Assets, Current Ratio, Financing Ratio, Leverage Ratio, Investment Ratio and Fixed Assets/Current Capital) using the Additive Ratio Assessment (ARAS) method. The ranking obtained as a result of the evaluation was compared with the companies included in the sustainability index. The prediction percentages for the periods analyzed were 45% (5/11), 64% (14/22), and 74% (25/34), respectively. As a result, it has been determined that financial performance alone may be a sufficient indicator for being included in the index.

Parlakkaya et al. (2019), in order to determine the effect of inclusion in the BIST Sustainability Index on company stock returns, examined the effects of the inclusion of a total of 43 companies in the BIST Sustainability Index on stock returns for the years 2014, 2015 and 2016 using the event study method. As a result, an evaluation was made on a yearly and collective basis and it was determined that inclusion in the BIST Sustainability Index had no effect on stock returns.

Celayir (2020) tried to measure intellectual capital, which accountants have difficulty in measuring and reporting, in his study to reveal the intangible assets that make them valuable, i.e. intellectual capital, although one of the main problems of businesses is not visible on their balance sheets. For this purpose, the financial data of BIST-Sustainability index companies were applied in VAIC™ (Intellectual Value Added Coefficient Method) and the relationship between the values found and some performance indicators used were investigated by correlation and linear regression analysis. The reason for the selection of the enterprises traded in the BIST-Sustainability index in the research is that the characteristics of the enterprises that enable them to be included in this index have a close relationship with intellectual capital that cannot be ignored. According to the research results, VAIC™ coefficients explained 93% of the return on assets.

Acar (2021) analyzed the sustainability reports of the companies included in the BIST sustainability index. Accordingly, it was tried to determine the extent to which companies include human resources management. In the research using content analysis, training, participation in management, employee continuity, and human resources planning were identified as material issues in sustainability reports.

Sevim (2021) argued that environmental activities are one of the most important pillars of sustainability activities in enterprises. From this point of view, the study investigated the impact of environmental investment expenditures on financial performance in enterprises. The data set used in

the study was compiled from the sustainability reports and financial statements published by the enterprises in the BIST Sustainability Index and the data were analyzed by multiple linear regression analysis methods. As a result of the study, it is generally revealed that environmental investment expenditures made by enterprises in Turkey have a negative impact on financial performance.

Acar et al. (2021) aimed to identify the factors that affect the inclusion of enterprises in the BIST (Borsa Istanbul) Sustainability Index through financial and non-financial variables. In this context, the data set consisting of 431 firm-year observations and covering the period 2011-2018 was analyzed with linear and logistic regression tests. According to the results obtained, factors such as board size, board independence, audit committee independence, audit firm being one of the big four audit firms, the existence of sustainability practices within the company and the age of the responsible auditor have a significant positive effect on the companies' being traded in the BIST sustainability index. In addition to these results, it is also among the results obtained that companies where the gender of the general manager is male and the gender of the responsible auditor is female are included in the sustainability index at a higher rate.

In a study conducted in Canada, Roca and Searcy (2012) analyzed the reports of 94 companies through content analysis. 31 of the 94 companies' reports included indicators recommended by the Global Reporting Initiative (GRI).

Reilly and Hynan (2014) examined how 16 global companies use social media platforms and corporate social responsibility reports. Companies selected from different industries are divided into green and non-green companies. As a result of the research, differences were observed between sectors in terms of the types of sustainability initiatives, the communication tool used and the metrics used. Accordingly, it has been determined that green companies are more active in social media activities and sustainability dissemination activities than non-green companies.

Pilař et al. (2019) focused on the impact of social media platforms to determine users' perception of sustainability. In the research, messages shared with the #sustainability hashtag on X platform (Twitter) were taken into account. Six sub-communities were determined: environmental sustainability, green architecture, renewable energy and climate change, food sustainability, and sustainability awareness. As a result of the analysis, sustainable business models were suggested to organizations.

Rosati and Faria (2019) discussed 27 institutional factors related to sustainable development goals. Considering 2413 sustainability reports, the sustainability activities of 90 different countries were examined. The study concluded that in countries where corporate social responsibility is higher, organizations are more vulnerable to climate change. The research will allow all stakeholders, especially investors and managers, to develop different strategies about the support they will give to organizations to achieve their development goals.

Tsalis et al. (2020) have presented a comprehensive evaluation framework to evaluate the information contained in sustainability reports within the scope of the United Nations Sustainability Goals. As a result of the analysis, it was concluded that the scope and quality of the information disclosed by the companies for the development goals vary. On a sectoral basis, they found that the industrial sector affects the reporting practices adopted by companies regarding their development goals. This situation reveals that the issue may vary on a sectoral basis. On the other hand, the research shows that the corporate reporting practices of companies in Greece are not affected by the 2030 development goals.

Salvatore et al. (2022) tried to determine the role of policymakers in the implementation of the 2030 development goals. From this point of view, they examined the communication of corporate social responsibility, the sustainability development framework and the corporate social responsibility

behaviors of businesses. It focused on businesses' messages about corporate social responsibility on social media and its relationship with development goals. In the research where X platform (Twitter) was taken into consideration as a social media application, metadata was used. As a result of the research, companies are interested in the social dimension of corporate social responsibility as well as economics and finance; It has been determined that they develop and implement programs to reduce inequality and discrimination, support training programs, and support local companies.

Huang et al. (2019) focused on the intermediary role of social media in disseminating sustainability information. By conducting an online survey on social media applications LinkedIn and X platform (Twitter), users' attitudes and motivations regarding the dissemination of sustainability information were examined. As a result, it was concluded that infographic messages have higher participation and response potential.

3. Method

Under this heading, general information about the X platform social media platform, the process of obtaining the data used in the research and the keywords related to sustainability used in the research are included.

3.1. X Platform

There are 4 different types of interaction in X platform posts. The first of these interactions is called "retweet" and refers to the re-tweeting of a user's post on X platform by another user. The number of retweets does not include the number of quotes, which is another type of interaction. Unlike repetitive sharing, quote sharing occurs when a comment is added to the post to make it different. If a post is differentiated by adding a comment on it and sharing again, it is called a "quote post". The number of quote shares does not include the number of re-shares (retweets). Another frequently used interaction type is the number of likes. The last type of interaction is the number of replies (“Developer Platform”, t.y.).

3.2. Data Acquisition

Within the scope of the study, the posts of the top 15 companies listed in Table 1, which are listed in the BIST Sustainability Index for 2022 and have the highest ESG score, were analyzed in Turkish from their corporate X platform accounts related to sustainability, taking into account the keywords mentioned in the United Nations Sustainability Plan (2030). Three companies were excluded from the analysis due to the limitations of the study, namely the existence of corporate X platform accounts of the companies and the consideration of their "Turkish" posts. ENKA İnşaat and KORDSA Teknik, which frequently post in English, as well as DOGUS Otomotiv, which does not have a corporate X platform account, were excluded. Thus, the study was conducted on 12 companies in the 2022 BIST Sustainability Index that have the highest ESG score and fulfill the constraints of the study.

Table 1. Top 15 Companies with the Highest ESG Score in the 2022 BIST Sustainability Index

XUSRD	BIST SUSTAIN	ESG Score	Environmental Pillar Score	Governance Pillar Score	Percentage
ARCLK.IS	ARCELIK	92,7	97,3	81,7	95,8
ENKAI.IS	ENKA INSAAT	88,2	91,8	70,0	97,9
KCHOL.IS	KOC HOLDING	88,2	96,1	76,4	93,0
SAHOL.IS	SABANCI HOLDING	87,8	93,5	81,3	88,3
ISCTR.IS	IS BANKASI (C)	87,5	96,4	71,1	96,8
ENJSA.IS	ENERJISA ENERJI	85,4	81,3	89,6	87,7
AKSA.IS	AKSA	83,7	82,9	82,3	84,6
KORDS.IS	KORDSA TEKNIK TE	83,4	70,8	88,3	90,9
MAVI.IS	MAVI GIYIM	82,7	88,8	67,9	93,4
ULKER.IS	ULKER BISKUVI	81,1	91,2	51,0	92,2
OTKAR.IS	OTOKAR	80,9	78,8	74,2	88,0
AKSGY.IS	AKIS GMYO	80,8	79,4	87,2	75,7
ANHYT.IS	ANADOLU HAYAT EM	80,7	73,5	85,2	78,9
GARAN.IS	GARANTI BANKASI	80,4	97,2	58,3	91,6
DOAS.IS	DOGUS OTOMOTIV	80,3	80,6	64,0	95,0

The keywords were determined by utilising the 17 Sustainable Development Goals listed in Table 2, which are addressed by the United Nations within the framework of the 2030 Agenda, and 585 different indicators used in corporate sustainability reports identified in the Canadian case study conducted by Roca and Searcy and presented in Table 3. In order to examine the relationship between the Sustainability Index ranking and information dissemination on social media, firstly, the keywords determined from the posts made by the companies on their corporate X platform accounts between 01.01.2014 and 01.01.2023 were filtered and the number of interactions of these posts was analyzed.

Table 2 presents the frequency of use of sustainability keywords by 12 companies whose posts containing the identified sustainability keywords were analyzed from their corporate X platform accounts. Cells left blank indicate that the keyword has never been used in X platform posts. For the coloring on the table, a transition from light to dark color was applied depending on the increase in the frequency of word usage. Among the identified keywords/word groups, "poverty, energy use, disabled employees, electricity use, investment in learning/education, solid waste, nitrogen oxide emission, hazardous waste, minority, social marketing, sulfur emission" were not used by any of the 12 companies in their X platform posts.

Table 2. Sustainability Keywords Used within the Scope of the Study

Source 1		Source 2	
Yoksulluk (Poverty)	Enerji (Energy)	Sera Gazı (Greenhouse Gas)	Elektrik Kullanımı (Electricity Use)
Açlık (Starvation)	Sürdürülebilir Ekonomi (Sustainable Economy)	Bağış (Donation)	Öğrenmeye/Eğitime Yatırım (Investment in Learning/Training)
Sağlık (Health)	İstihdam (Employment)	Salınım (Oscillation)	Katı Atık (Solid Waste)
Eğitim (Education)	Eşitsizlik (Inequality)	Kadın (Woman)	Karbon Emisyonu (Carbon Emissions)
Cinsiyet (Gender)	Sürdürülebilir (Sustainable)	Ücret (Fee)	Ağaç (Tree)
Kadın (Woman)	Tüketim (Consumption)	Enerji Kullanımı (Energy Use)	Azot Oksit Emisyonu (Nitrogen Oxide Emission)
Kız (Girl)	İklim (Climate)	Engelli Çalışan (Disabled Employee)	Tehlikeli Atık (Hazardous Waste)
Temiz su (Clean Water)	Su (Water)	Su Tüketimi (Water Consumption)	Azınlık (Minority)
Barış (Peace)	Adalet (Justice)	Enerji Tüketimi (Energy Consumption)	Sosyal Pazarlama (Social Marketing)
		Fosil Yakıt (Fossil Fuel)	Geri Dönüşüm (Recycling)
		Kükürt Emisyonu (Sulphur Emissions)	Geri Dönüştürülmüş (Recycled)
		Gönüllülük (Volunteering)	Küresel Isınma (Global Warming)

Source 1: Tsalis et al. (2020) & **Source 2:** Roca & Searcy (2012)

4. Findings

The relationship between the frequency of use and interaction of sustainability keywords and BIST Sustainability Index scores is presented below.

4.1. Frequency of Use of Sustainability Keywords

Table 3 below shows the frequency of use of sustainability keywords in the X platform posts of the 12 companies analyzed.

Table 3. Frequency of Use of Sustainability Keywords in X Platform Posts

	ARCELIK	KOCH.	SABANCI H.	IS BANKASI	ENERJISA	AKSA	MAVI GIYIM	ULKER BISKUVI	OTOKAR	AKISGMYO	ANADOLU HAYAT	GARANTI BANKASI	Total
Starvation				1				1	4			1	7
Justice				1						1			2
Tree	2		1	8			6	2	2		11	4	36
Donation	4	3	4	8	3		4	1		2	4	23	56
Peace	2			2			3		11	1	5	21	45
Gender	2	20	8	3	4	2	1		8	4	1	16	69

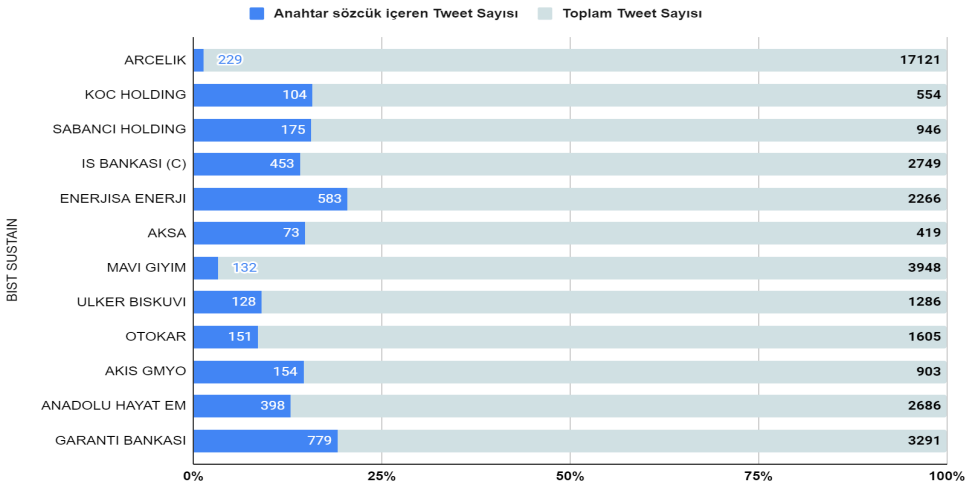
Table 3. Frequency of Use of Sustainability Keywords in X Platform Posts (cont'd)

Education	6	18	22	33	10	14	4	2	17	13	29	90	258
Energy	66	6	33	5	553	5	31	9	9	59	28	56	860
Energy Consumption	1				2						1	2	6
Inequality	1	2											3
Fossil Fuel			1						2			1	4
Recycling	10						4	1			5	13	33
Recycled	5					1	11						17
Volunteering			6				2	1				4	13
Climate	14	7	16	11	7	6	3	3	17	3	8	84	179
Employment			2	1	1	1		1	1	6		6	19
Woman	15	28	44	53	11	11	50	13	8	30	206	242	711
Carbon Emissions					1							9	10
Girl	2	6	4				2			3	1	1	19
Global Warming				1		1				3		1	6
Health	80	14	22	261	3	18	6	15	7	16	35	101	578
Oscillation										3	1		4
Greenhouse Gas		1				1				1		5	8
Water	48	2	9	14	3	6	5	7	6	25	11	28	164
Water Consumption	2			1		1		1			1	1	7
Sustainable	15	7	27	15	37	17	17	47	8	22	81	203	496
Sustainable Economy				1								1	2
Clean Water	1									3			4
Consumption	7	4		1	11	1		3	19		3	22	71
Fee	16	8	2	67	10	2	3	36	11	3	1	57	216
Production	10	1	6	3	6	4	2	7	21	3	2	15	80

It is seen that the keywords/word groups used in the posts made by all analysed companies are "Energy (860), Woman (711), Health (578), Sustainable (496), Education (258), Fee (216), Climate(179) ve Water (164)". Among these, especially the keywords "Woman", "Energy" and "Health" stand out as the main topics that are frequently emphasised by companies, as can be seen from the high frequency of use values.

Companies' habits of posting/not posting frequently on social media vary. Instead of measuring the frequency of use of this keyword, the intensity value that can be obtained in proportion to the number of posts contains more interpretable information. For this reason, as seen in the graph in Figure 2, none of the companies ranking high in the BIST Sustainability Index post on the topics included in this scope even in 25 per cent of their posts.

Figure 2. Graph of the Number of Tweets Containing Sustainability Keywords in X Platform Posts and Total Number of Tweets



It is noteworthy that Arçelik, whose habit of frequent sharing on X platform is quite dominant compared to other companies and whose ESG score is calculated as the highest, has the lowest rate of sustainability-themed posts compared to other companies. On the other hand, although Enerjisa Enerji, a company in the energy sector, has a high proportion of sustainability-related posts, it is seen that approximately 95% of them contain the keyword "Energy".

4.2. Interaction Frequency of Sustainability Keywords

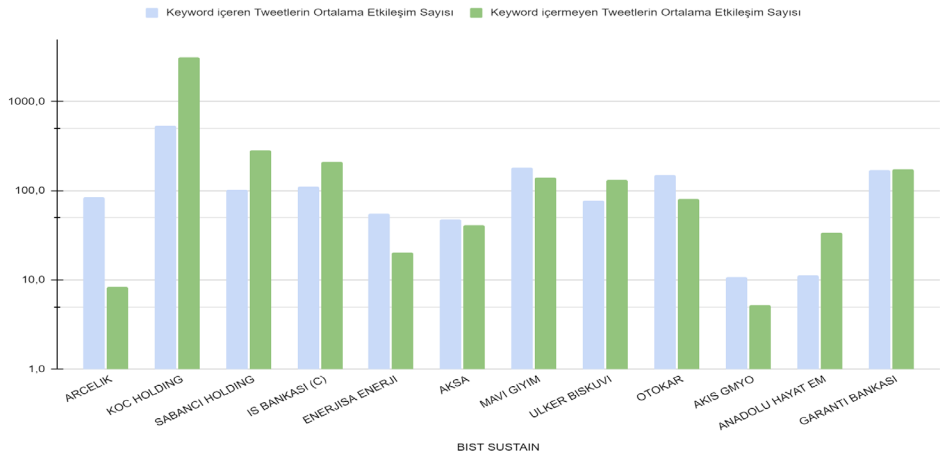
Table 4 shows the average number of interactions of the posts with and without keywords of the companies ranked from high to low by the Sustainability Index ranking.

Table 4. Total and Average Number of Interactions for Posts with and Without Keywords

BIST SUSTAIN	Number of Tweets containing keywords	Total Number of Interaction of Tweets containing keywords	Tweets containing keywords Average Number of Interactions	Number of Tweets without keywords	Total Interactions of Tweets without keywords	Tweets without keywords Average Number of Interactions
ARCELIK	229	19227	84,0	16892	140282	8,3
KOC HOLDING	104	56109	539,5	450	1423372	3163,0
SABANCI HOLDING	175	17732	101,3	771	217416	282,0
IS BANKASI (C)	453	50973	112,5	2296	485326	211,4
ENERJISA ENERJI	583	32483	55,7	1683	34332	20,4
AKSA	73	3503	48,0	346	14116	40,8
MAVI GIYIM	132	24189	183,3	3816	540141	141,5

ULKER BISKUVI	128	10015	78,2	1158	152715	131,9
OTOKAR	151	17402	151,3	1454	120382	82,8
AKIS GMYO	154	1671	10,9	749	3948	5,3
ANADOLU HAYAT EM	398	4507	11,3	2288	77464	33,9
GARANTI BANKASI	779	131764	169,1	2512	433046	172,4

Figure 3. Graph of Average Number of Interactions for Posts with and without Keywords



The year 2014, when the BIST sustainability index was calculated, was taken as a base and all messages of the companies as of 01.01.2014 were included in the analysis. Thus, the role of X platform in the dissemination of sustainability information was tried to be revealed, and on the other hand, it was determined whether there is a relationship between the sustainability index ranking and the intensity of information dissemination on social media.

4.3. The Relationship between Sustainability Index Ranking and the Prevalence of Sustainability-related Posts on Social Media

Table 5. The Relationship Between Companies' Use of Keywords and ESG Scores

		ESG Scores
Ratio of Twits with Keyword to Total Number of Twits	Spearman Correlation Coefficient	-0,021
	P value	0,948
Number of Twits with Keyword	Spearman Correlation Coefficient	-0,189
	P value	0,557

According to Table 5, there is no significant relationship between companies' Sustainability Index scores and the number of messages containing sustainability keywords shared on X platform and the ratio of these messages to the total number of messages. The companies with the highest ESG scores were Arçelik, Koç Holding, and Sabancı Holding, while the companies that shared tweets containing keywords the most were Enerjisa, Garanti Bank, and Koç Holding, respectively.

4.4. Identifying Themes Related to Sustainability and Creating Turkish Keywords

Within the scope of the research, all tweets of the 12 companies included in the research containing the relevant keywords were taken into consideration and the themes formed by the keywords were

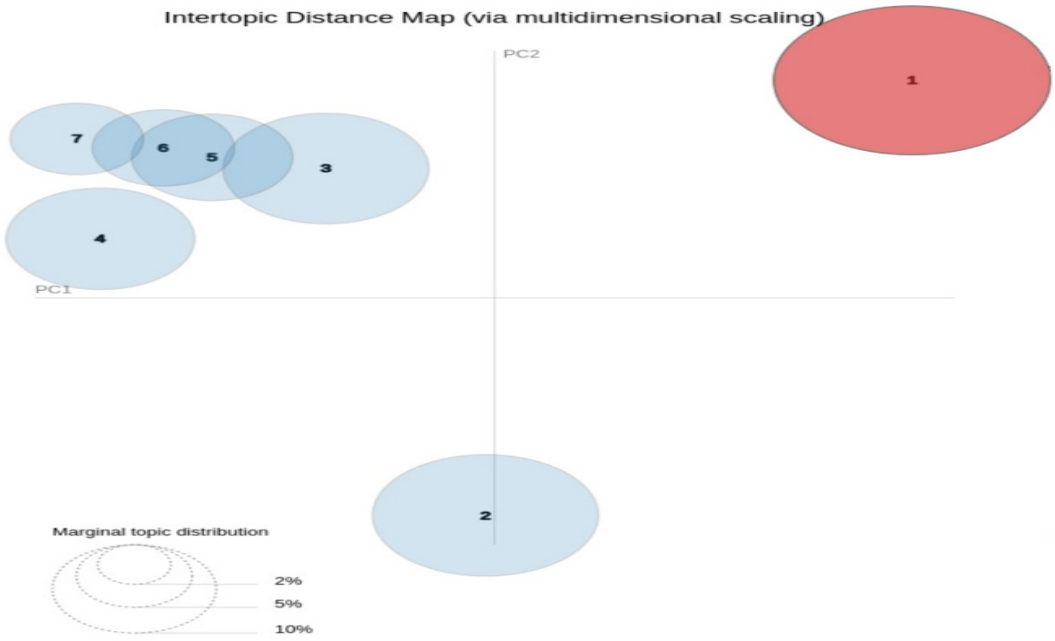
revealed. Accordingly, Table 6 shows the related themes and the most frequently used words containing the themes. Figure 3 shows the relationships between the themes.

Table 6. Original Themes

Themes	Contents*
1	healthy, good, world, health, hello, climate, future, sustainable, days, happy, world, education, future, day, contribution, happy, knowledge, women, communication, green, service, sustainability, life, support
2	women, free, entrepreneur, of, turkey, free, entrepreneur, life, frame, from, life, again, entrepreneurial, carbon, our, photographers, exhibition, special, support, contest, training, with, support, today, entrepreneurs, istanbul
3	water, read, plastic, climate, single, women, saving, treatment, sustainable, entrepreneur, good, world, turkey, clean, energy, consumption, water, sustainability, reduce, women, consumption, natural, united, nations
4	health, future, sea, sustainable, future, transformation, blessed, let's, protect, blue, great, producing, video, natural, forward, our, children, part, of, our, world, solution, day, club, area, participating, in, mothers, movement, waste
5	education, named, artifact, exhibiting, water, tool, saving, greenhouse, gas, education, friendly, your, child, assurance, water, monument, person, source, children, environment, sun
6	energy, holding, sustainability, women, board, gender, sustainable, management, turkey, social, women, equality, innovation, social, europe, technology, climate
7	energy, enerjisa, your, energy, saving, energy, information, electricity, blue, free, protect, close, high, open, saving, nature, summer, from, link, read, protect, efficient, virtue, mobile, all

* Some verbs and prepositions have been eliminated as irrelevant.

Figure 4. Appearance of Themes



As seen in Figure 4, the messages containing keywords of the companies with the highest sustainability index are divided into 7 themes and it is seen that themes 3, 5, 6, and 7 contain common words. Therefore, when the number of themes was determined as 3, the following themes were obtained. In these themes, irrelevant words were eliminated.

Table 7. Final Themes

Themes	Contents*

1: Health (sağlık)-education (eğitim)- woman (kadın)	Healthy (sağlıklı), sustainable (sürdürülebilir), sustainability (sürdürülebilirlik), health (sağlık), woman (kadın), education (eğitim), blessed (kutlu), knowledge (bilgi), future (geleceğe), gender (cinsiyet), support (destek), world (dünyaya), future (gelecek), women (kadınlar), happy (mutlu), service (hizmet)
2: Climate (iklim)-environment (çevre)	Climate (iklim), türkiyenin, free (ücretsiz), carbon (karbon), sustainable (sürdürülebilir), good (iyi), future (gelecek), environment (çevre), plastic (plastik), waste (atık), today (bugün), friendly (dostu), World (dünya), water (su)
3: Energy (enerji)-saving (tasarruf)	Energy (enerji), water (su), saving (tasarruf), sustainable (sürdürülebilir), electricity (elektrik), financial (finansal), mobile (mobil), consumption (tüketim)

According to Table 7, the content can be categorized under 3 main headings. Accordingly, the first theme can be analyzed under the general heading of health, education, and women. The second theme can be analyzed under the heading of climate and environment, while the third theme can be evaluated under the heading of energy in general.

Conclusion

Unlike traditional knowledge management methods, companies can use social media platforms for faster knowledge dissemination. This study evaluates how companies use X platform, one of the social media platforms, to disseminate sustainability knowledge. For this reason, companies that stand out in sustainability activities in Turkey are identified according to their BIST Sustainability Index scores. Accordingly, the 12 companies with the highest BIST Sustainability Index scores were included in the study. The frequency of use of sustainability keywords and interaction rates were determined from the messages published by these companies since 2014. For this purpose, keywords compiled from Tsalis et al. (2020) and Roca & Searcy (2012) and adapted in Turkish were used.

As a result of the research, it is seen that the keywords/phrase groups used in the posts made by all companies are "education, energy, climate, women, health, water, sustainable, wages, production". Of these, especially the keywords "women", "energy" and "education" stand out as the main topics that are frequently emphasized by companies, as evidenced by their high frequency of use values. In terms of the use of sustainability concepts by companies, 95% of Enerjisa's messages contain the keyword "energy". No significant relationship was found between the BIST Sustainability Index scores, which is the main research question of the study, and the frequency of including sustainability keywords in messages on X platform. This suggests that companies should use social media platforms more efficiently to disseminate sustainability information and activities. There is no research in the literature that analyzes the same data as the research topic. However, there is no significant difference between the average rate of return of firms included in the sustainability index and the average rate of return of firms not included in the sustainability index (Çıtak and Ersoy, 2016) and inclusion in the BIST Sustainability Index has no effect on stock returns (Parlakkaya et al., 2019). Taken together, these results suggest that BIST Sustainability Index scores do not yet directly reflect the performance of companies in terms of different indicators.

On the other hand, the themes identified can serve as a source for sustainability research. When the keywords in the themes and the keywords utilized within the scope of the research are evaluated together, a comprehensive and up-to-date word list on the subject is created. Especially social media messages can be used as keywords in sustainability reports and content research on the subject.

The main limitations of this study are that the companies included in the research were determined according to the BIST Sustainability Index, the first 15 companies were selected from the relevant list and X platform was selected as the social media platform. In future studies, different criteria such as sustainability reports and different social media applications can be taken into consideration. On the

other hand, in future studies, in-depth interviews with the relevant companies to determine what kind of policies they follow regarding the dissemination of sustainability information and activities and focusing on how these practices can be improved will have positive results and will be a guide for companies that are at the beginning of their sustainability activities.

References

Acar, S. (2021). Sürdürülebilirlik raporlarının sürdürülebilir insan kaynakları yönetimi yönüyle incelenmesi: BIST sürdürülebilirlik endeksi örneği. *Kafkas University. Faculty of Economics and Administrative Sciences Journal, 12*(23), 347-368. https://doi.org/10.36543/kauiibfd.2021.016

Acar, Ü. M., Durmaz, Ş., & Coşgunaras, Ş. N. (2021). Sürdürülebilirlik performansını etkileyen finansal ve finansal olmayan faktörler üzerine bir araştırma: BIST sürdürülebilirlik endeksi örneği. *Muhasebe ve Vergi Uygulamaları, 14(*1).

Aksoylu, S., & Taşdemir, B. (2020). Kurumsal sürdürülebilirlik performans değerlendirmesi: Bist sürdürülebilirlik endeksinde bir araştırma. *Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 13*(1), 95-106.

Aracı, H., Yüksel, Ö., & Filiz, G. (2016). Şeffaflik ve hesap verilebilirliğin sağlanmasinda sürdürülebilirlik raporlari: BIST sürdürülebilirlik endeksindeki şirketlerin sürdürülebilirlik raporlarinin ıncelenmesi. World of Accounting Science, 18.

Akyüz, F., & Yeşil, T. (2017). BIST sürdürülebilirlik endeksine kayıtlı üretim sektöründe faaliyet gösteren şirketlerin finansal performanslarının incelenmesi. Akademik Araştırmalar ve Çalışmalar Dergisi (AKAD), 9(16), 61-78. https://doi.org/10.20990/kilisiibfakademik.270635

Aytekin, S., & Erol, A. F. (2018). Finansal performans kurumsal sürdürülebilirlik performansının temel belirleyicisi midir? BIST sürdürülebilirlik endeksinde ARAS yöntemi ile bir uygulama. *Uluslararası İktisadi ve İdari İncelemeler Dergisi,* 869-886. https://doi.org/10.18092/ulikidince.435519

Borsa İstanbul (t.y.). Sürdürülebilirlik endeksleri. Retrieved from: https://www.borsaistanbul.com/tr/sayfa/165/bist-surdurulebilirlik-endeksleri

Celayir, D. (2020). Kurumsal yönetim açısından sürdürülebilirlik raporlarının güvencesi ve Borsa İstanbul (BIST) sürdürülebilirlik endeksi üzerinde bir inceleme. *Business & Management Studies: An International Journal, 8*(1), 20-44. https://doi.org/10.15295/bmij.v8i1.1375

Çıtak, L., & Ersoy, E. (2016). Investors' reactions to the ınclusion of firms in the bist sustainability index: An analysis by event study and mean-median tests. *International Journal of Alanya Faculty of Business, 8*(1), 43-57.

Developer Platform (t.y.). Metrics. Retrieved from: https://developer.twitter.com/en/docs/twitter-api/metrics

Ertan, Y. (2018). Türkiye'de sürdürülebilirlik raporlaması (2005-2017). *Journal of Accounting and Taxation Studies, 11*(3), 463-478. https://doi.org/10.29067/muvu.410926

Hizarci-Payne, A. K., & Kirkulak-Uludag, B. (2018). Sustainable business practices of Turkish companies listed on the Borsa Istanbul sustainability index. In: Sustainable Business Models, pp. 329-344 Springer, Cham. https://doi.org/10.1007/978-3-319-73503-0_15

Huang, L., Clarke, A., Heldsinger, N., and Tian, W. (2019). The communication role of social media in social marketing: A study of the community sustainability knowledge dissemination on LinkedIn and Twitter. *Journal of Marketing Analytics, 7*(2), 64-75. https://doi.org/10.1057/s41270-019-00053-8

Kotler, P., & Zaltman, G. (1971). Social marketing: An approach to planned social change. Journal of Marketing, 35(2), 3–12.

Murphy, G., & Salomone, S. (2013). Using social media to facilitate knowledge transfer in complex engineering environments: a primer for educators. *European Journal of Engineering Education, 38*(1), 70-84. https://doi.org/10.1080/03043797.2012.742871

Ozmehmet, E. (2008). Dünyada ve Türkiye sürdürülebilir kalkinma yaklaşimlari. Yaşar Üniversitesi E-Dergisi, 3(12), 1853-1876.

Parlakkaya, R., Kahraman, Ü. M., & Cihan, Y. (2019). BIST sürdürülebilirlik endeksine alınmanın etkileri: Borsa İstanbul'da bir uygulama. *Maliye ve Finans Yazıları,* (111), 33-50. https://doi.org/10.33203/mfy.455322

Pilař, L., Kvasničková Stanislavská, L., Pitrová, J., Krejčí, I., Tichá, I., & Chalupová, M. (2019). Twitter analysis of global communication in the field of sustainability. *Sustainability, 11*(24), 6958. https://doi.org/10.3390/su11246958

Reilly, A. H., & Hynan, K. A. (2014). Corporate communication, sustainability, and social media: It's not easy (really) being green. *Business Horizons, 57*(6), 747-758. https://doi.org/10.1016/j.bushor.2014.07.008

Roca, L. C., & Searcy, C. (2012). An analysis of indicators disclosed in corporate sustainability reports. *Journal of Cleaner Production, 20*(1), 103-118. https://doi.org/10.1016/j.jclepro.2011.08.002

Rosati, F., & Faria, L. G. (2019). Addressing the SDGs in sustainability reports: The relationship with institutional factors. *Journal of Cleaner Production*, 215, 1312-1326. https://doi.org/10.1016/j.jclepro.2018.12.107

Salvatore, C., Biffignandi, S., & Bianchi, A. (2022). Corporate social responsibility activities through Twitter: From topic model analysis to indexes measuring communication characteristics. *Social Indicators Research,* 1-32. https://doi.org/10.1007/s11205-022-02993-8

Sevim, U. (2021). İşletmelerin çevresel yatırım harcamalarının finansal performans üzerine etkisi: BİST sürdürülebilirlik endeksi üzerine bir araştırma. *Gazi İktisat ve İşletme Dergisi, 7*(1), 55-67. https://doi.org/10.30855/gjeb.2021.7.1.004

Şahin, Z., Çankaya, F., & Karakaya, A. (2018). Sürdürülebilirlik raporlarinin sektörlere ve yillara göre analizi. *Uluslararası İktisadi ve İdari İncelemeler Dergisi,* (20), 17-32. https://doi.org/10.18092/ulikidince.311026

Tsalis, T. A., Malamateniou, K. E., Koulouriotis, D., & Nikolaou, I.E. (2020). New challenges for corporate sustainability reporting: United Nations' 2030 Agenda for sustainable development and the sustainable development goals. *Corporate Social Responsibility and Environmental Management, 27*(4), 1617-1629. https://doi.org/10.1002/csr.1910

United Nation (t.y.). Global Sustainable Development Report (GSDR). Retrieved from: https://sdgs.un.org/gsdr

United Nation (t.y.). The 17 goals. Retrieved from: https://sdgs.un.org/goals