
Comparison of ESG Methodologies in the Effect of Sustainability Accounting Practices on Financial Performance: A Research within the Scope of BIST Companies

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Abstract: Environmental, social, and governance activities are prioritized in sustainability accounting practices. Many rating agencies currently measure these activities as ESG scores, which serve as crucial indicators of sustainable accounting practices. This study aims to determine the effect of sustainability accounting practices on financial performance by comparing different ESG methodologies. To this end, for 58 Borsa İstanbul-listed companies, the relationships between the ESG scores calculated by LSEG for 2024, by S&P Global for 2025, and by CSR HUB for 2025, and the financial performance scores calculated using the MEREC-MARCOS methods were determined via correlation and regression analyses. Statistical analyses revealed that LSEG ESG scores had a significant and positive effect on financial performance; however, S&P Global and CSR HUB ESG scores did not have a significant effect. However, another important finding is that the explanatory power of ESG scores for financial performance varies across ESG data providers. The findings contribute to the literature by demonstrating that, rather than generalizing the relationship between companies' sustainability accounting practices and their financial performance based on a single organization's ESG score, separately accounting for scores calculated by different rating agencies would allow for a more accurate assessment. The theoretical implication of this study is that the effect of ESG scores, an indicator of sustainability accounting practices, on the financial performance of businesses may stem not only from country and sector differences but also from the specific calculations of ESG methodologies.

Keywords: ESG agencies, ESG score, financial performance, financial ratios, MEREC-MARCOS, sustainability accounting.

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INTRODUCTION

Sustainability accounting analyzes the financial effects arising primarily from environmental and social factors of a specific economic system, such as a business or production facility; secondarily, its ecological and social effects; and, finally, the interactions and relationships among the three aspects of sustainability: social,



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environmental, and economic. Accordingly, it is defined as a subfield of accounting that examines a business's operations, methods, and systems to report on the results of these analyses (Schaltegger & Burritt, 2010). Similar to traditional accounting, sustainability accounting identifies the data to be collected regarding a company's economic, social, and environmental performance, evaluates the collected data, and ultimately provides feedback to the company, all intending to meet the information needs of top management (Tüm, 2014). The fact that sustainability accounting is rooted in social and environmental factors is the key distinction from traditional accounting. Sustainability accounting is particularly important for businesses in ensuring compliance with legal regulations and fulfilling the requirement for corporate transparency; it fulfils this function within the framework of economic, environmental, and social factors (Schaltegger & Burritt, 2010). Today, with a corporate perspective intertwined with sustainability, economic factors have given way to governance, and the ESG (Environmental, Social, and Governance) concept has emerged as a means of measuring businesses' sustainability accounting practices. If sustainability accounting is viewed as a data-collection mechanism, then ESG is a metric that standardizes the collected data, providing investors and stakeholders with an opportunity to evaluate it.

In its current sense, ESG is not merely an ethical or environmental choice; it is a concept that systematically integrates sustainable accounting practices into financial statements, aims to create long-term value, meets investor expectations, and contributes to corporate sustainability (Bacak, 2025). The environmental aspect of ESG focuses on issues such as carbon emissions, energy use, natural resource management, and adaptation to climate change, with the aim of efficient resource use and reduced environmental impacts (Burak, 2026; Tellioglu, 2025). The social aspect, on the other hand, focuses on human-centred processes, such as employee rights, occupational health and safety, contributions to society, and customer satisfaction, within the scope of businesses' behaviours toward their employees, customers, suppliers, and society (Burak, 2026; Kaya, 2026). Finally, the governance aspect encompasses management policies, corporate structure, ethics, audit mechanisms, and anti-corruption issues within the scope of corporate governance principles such as transparency, accountability, and stakeholder participation (Doğan, 2024; Tellioglu, 2025). These aspects have become crucial criteria for evaluating the level of sustainable accounting practices in businesses. Through ESG scores determined by these criteria, investors and stakeholders have gained the opportunity to analyse businesses' ethical responsibilities, environmental sensitivity, and overall corporate governance structures (Barbosa, da Silva, da Silva, Morioka, & de Souza, 2023). In this regard, many ESG rating agencies collect and analyse information on companies' environmental, social, and governance performance, similar to credit rating agencies, and share the results with investors and other stakeholders (Landi & Sciarelli, 2019). Although debates regarding the calculation and disclosure of ESG scores or indices continue, they are widely accepted and used as a benchmark for companies' sustainable accounting practices (Whitelock, 2019).

Numerous methods have been developed in the literature to measure the financial performance of businesses. Financial ratios are commonly used as measurement tools in most of these methods. It is possible to assess the financial performance of businesses using financial ratios calculated across various classifications. Businesses have been ranked by their financial performance, particularly using Multi-Criteria Decision-Making (MCDM) methods in recent years. Accordingly, studies in the literature have investigated which concepts might influence financial performance.

Studies in the literature examining the effect of ESG scores, which serve as indicators of sustainability accounting practices, on financial performance have not reached a definitive, empirically supported conclusion (Friede, Busch, & Bassen, 2015; Kaya, 2026). Apart from the positive effect of ESG scores on financial performance in terms of increasing firm value, improving operational efficiency, and reducing the cost of capital, it has also been argued that sustainability accounting practices that are costly may hurt financial performance in the short term (Eccles, Ioannou, & Serafeim, 2014; Krüger, 2015). The fact that studies on this topic vary across countries, sectors, time periods, data sources, and analytical methods leads to conflicting results. Accordingly, there is a need for up-to-date studies that enable comparison and clarify the effect of sustainability accounting practices on financial performance (Kaya, 2026; Wang & Sarkis, 2017).

The purpose of this study is to determine the effect of companies' sustainability accounting practices on financial performance by comparing different ESG methodologies. While studies in the relevant literature use content analysis to examine expenditures on sustainability accounting practices or to assess whether a company is included in a Sustainability Index, this study seeks to determine the effect of companies' sustainability accounting practices on their financial performance using ESG scores from various rating agencies. For Borsa Istanbul (BIST)-listed companies, ESG scores for 2024 were obtained from LSEG, and those for 2025 were obtained from S&P Global and the CSR HUB platforms; correlation and regression analyses were used to determine the effect of these scores on their financial performance, which was ranked using the MEREC-MARCOS method. While data for studies on ESG scores are typically sourced from the LSEG platform (formerly Refinitiv Eikon-Thomson Reuters), this study also uses ESG scores from the S&P Global and CSR HUB platforms. Given the lack of consensus in the literature regarding the effect of ESG scores on financial performance, this study aims to bring a new viewpoint to the discussion by examining how ESG practices function in different economic and regulatory environments within an emerging market like Türkiye, while also presenting information on current market dynamics using recent data.

This study hypothesizes about the effect of ESG rating agencies on financial performance and whether the explanatory power of ESG scores varies across ESG information providers. Based on these hypotheses, a three-way comparison of ESG methodologies in terms of their effects on financial performance is a unique aspect of this study. Another unique aspect is that, unlike the literature on the relationship between ESG scores and financial performance, this study uses the MEREC-MARCOS methods to weight not only profitability ratios but also other financial ratios, thereby deriving a single financial performance score.

LITERATURE REVIEW

Some studies examine sustainability accounting practices by conducting content analysis of companies' published reports or by accounting for their environmental expenditures. However, ESG scores have come to the forefront as a measure of sustainability accounting practices in recent years. The literature review conducted in this study is within the scope of the effects of ESG scores. The effect of ESG scores, which serve as an indicator of sustainability accounting practices, on companies' financial performance is also a frequently researched topic.

Numerous studies attempt to measure financial performance using financial ratios classified in various ways. Since our study employs MCDM methods to measure and rank financial performance, the literature review was also conducted within this framework.

Friede et al. (2015) conducted a comprehensive review of studies on the effect of ESG practices on financial performance and found that, in approximately 90% of the 2,200 academic studies conducted since the early 1970s, the relationship between ESG and financial performance was not negative and, more importantly, could largely be considered positive. In another study conducted in a similar vein, Whelan, Atz, Van Holt, and Clark (2021) analyzed the relationship between ESG and financial performance in more than 1,000 research articles published between 2015 and 2020.

A positive relationship was found in 58% of these studies; a neutral (non-significant) effect in 13%; mixed results (positive, neutral, or negative findings within the same study) in 21%; and a negative relationship in 8%. From a general perspective, based on these studies and the varying results across countries, sectors, and even individual companies, it can be stated that while there are positive findings regarding the effect of ESG practices on financial performance, there is no complete consensus on the matter. Literature studies on the effect of ESG scores on financial performance within the framework of ESG rating agencies used in this study are summarized in Table 1, following the Whelan et al. (2021) classification.

Table 1: Studies in the Literature on the Relationship Between ESG Score and Financial Performance

ESG Rating Agency	Findings	Methodology
LSEG	Positive Effect: Ahmad, Mobarek, and Roni (2021); Aydoğmuş, Gülay, and Ergun (2022); Bodhanwala and Bodhanwala (2018); Bahadori, Kaymak, and Seraj (2021); Chen, Song, and Gao (2023); Jyoti and Khanna (2021); Kaya (2026); Naeem, Ullah, and Jan (2021); Ni and Sun (2023); Özer, Aktaş, and Çam (2023); Ting, Azizan, Bhaskaran, and Sukumaran (2020) and Tanc (2026) De Lucia et al. (2020)	Panel Data Analysis (correlation and regression analysis)
	Bilgin and Yilmaz (2025)	Machine Learning Techniques and Ordered Logistic Regression
	Negative Effect: Peiró-Signes, Segarra-Oña, Mondéjar-Jiménez, and Vargas-Vargas (2013)	Data Envelopment Analysis (DEA)
	Çakmak and Çalis (2024); Duque-Grisales and Aguilera-Caracuel (2021); Garcia and Orsato (2020); and Tellioğlu (2025)	ANOVA Analysis
	Garcia and Orsato (2020), Duque-Grisales and Aguilera-Caracuel (2021), Çakmak and Çaliş (2024), Tellioğlu (2025)	Panel Data Analysis (correlation and regression analysis)
	Mixed Results: Atay, Tarınc, and Kılınç (2023); Dutt, Jain, Sharma, and Bhattacharya (2025); Giannopoulos, Kihle Fagernes, Elmarzouky, and Afzal Hossain (2022); Hassan and Roychowdhury (2019); Nazarova and Lavrova (2022); Possebon, Cippiciani, Savoia, and de Mariz (2024); Şişman and Çankaya (2021); Saha and Khan (2024) and Velte (2017)	Panel Data Analysis (correlation and regression analysis)
	Neutral Effect: Öner and Çinko (2026)	Data Envelopment Analysis (DEA)
	Atasel and Güneysu (2023); Garcia, Mendes-Da-Silva, and Orsato (2017) and Şeker and Güngör (2022)	Panel Data Analysis (correlation and regression analysis)
	Positive Effect: Çetin, Öztürk, and Akarsu (2024); Karyağdı and Şit (2023); Yıkılmaz (2022) and Yadav, Dhingra, Batra, Saini, and Aggarwal (2025)	Panel Data Analysis (correlation and regression analysis)
	Negative Effect: Chau, Anh, and Duc (2025) and Rao and Juma (2024)	Panel Data Analysis (correlation and regression analysis)
S&P Global	Neutral Effect: Zumente and Lâce (2022)	Quarterly Analysis Method
CSR HUB	Positive Effect: Arminen, Puumalainen, Pätäri, and Fellnhofer (2018); Lin, Hung, Chou, and Lai (2019); Mukoki (2015); Motwani and Pandya (2016); Sandberg, Alnoor, and Tiberius (2023); Volkova and Kuznetsova (2022); and Yousefian, Bascompta, Sanmiquel, and Vintró (2023)	Panel Data Analysis (correlation and regression analysis)
	Soytas, Denizel, and Usar (2019)	Two-Stage Least Squares Analysis
	Lin, Ho, Lee, and Ng (2020)	Generalized Method of Moments (GMM)
	Negative Effect: Kooskora, Juottonen, and Cundiff (2019) and Zhuang, Denizel, and Montabon (2023)	Panel Data Analysis (correlation and regression analysis)
	Neutral Effect: Markhaichuk (2017); Mišura, Cerović, and Buterin (2018); and McAdoo (2020)	Data Envelopment Analysis (DEA) Panel Data Analysis (correlation and regression analysis)

A general review of the literature on the effect of ESG scores calculated by LSEG on financial performance reveals that most studies employ regression and correlation analyses, with a small number utilizing MCDM methods. The studies are mostly set in developing or developed countries, and the financial performance

metrics most commonly used include return on assets (ROA), return on equity (ROE), Tobin's Q ratio, and net profit margin. A positive relationship was observed between ESG scores and financial performance indicators in most studies; however, many studies also reported negative, complex (positive with some indicators and negative with others, or no relationship at all), and neutral (non-significant) relationships. When the literature on the effect of S&P Global ESG scores on financial performance is evaluated as a whole, it is evident that, compared with other ESG rating agencies, S&P Global's scores are used in fewer studies. In general, the studies used correlation and regression analyses and suggest that ESG scores are positively associated with profitability ratios, a financial performance indicator, while exhibiting a complex relationship with stock returns. When the literature on the effect of CSR HUB ESG scores on financial performance is evaluated as a whole, it can be stated that regression and correlation analyses are frequently used, with financial performance metrics such as ROA, ROE, net profit margin, and the Tobin Q ratio being employed, and that in most of the studies, the relationship between ESG scores and financial performance is positive. A major reason for inconsistent results stemming from methodological differences is that ESG rating agencies use different headings, criteria, and weightings when calculating ESG scores. Another reason is that the studies are conducted in different categories, such as developed or developing countries. A further reason is that the studies are conducted over different time periods with varying economic conditions. The last reason is that the studies are generally conducted on all companies listed on the stock exchange or in specific sectors.

ESG scores are global indicators of sustainable accounting practices, measured and calculated by numerous organizations. Numerous studies have employed scores from Bloomberg, MSCI, Sustainalytics, and country-specific indices, in addition to those from LSEG, S&P Global, and CSR HUB, which are covered in this study. When it comes to studies comparing different ESG methodologies, Oshchepkova (2019), in a correlation analysis of 2017 data covering 312 companies worldwide, found that ESG scores from LSEG and CSR HUB had a positive effect on financial performance indicators such as ROA, current ratio, and profit margin. Conway (2019) assessed the alignment between Bloomberg and CSR HUB ESG scores across 720 U.S. and European companies and found a high degree of alignment. Freitas and Crisóstomo (2021) noted that, despite the use of different methodologies for measuring ESG scores by LSEG and CSR HUB for Brazilian companies, based on data from 2013 to 2017, consistency and convergence are evident due to a positive correlation. Berg, Kölbel, and Rigobon (2022) classified differences among the ratings used to measure ESG scores across organizations and emphasized the need to pay attention to how the data are generated. Gyönyörová, Stachoň, and Stašek (2023) stated that the consistency and validity of ESG scores reported by various organizations are affected by sector type or country, and that this should be taken into account when using the data in a similar study. Dhasmana, Ghosh, and Kanjilal (2023) found that, among Indian companies, there is a correlation between ESG scores measured by MSCI and Sustainalytics and investor sentiment, but that the relationship is asymmetric. Kottapalli and Mishra (2024) used ESG scores from MSCI and S&P Global, along with machine learning techniques, to develop a new model for calculating ESG scores. Wu, Deng, and Gao (2024) noted that companies should avoid an excessive focus on ESG, which could lead to poor financial performance, and they used MSCI and Bloomberg ESG scores for Chinese companies. Lauria, Lindquist, Mitnik, and Rachev (2025) thoroughly examined the entire investment process by comparing ESG scores provided by LSEG and S&P Global within the framework of dynamic asset pricing. Balan, Antunes, Wanke, Tan, and Gerged (2026) compared ESG scores from Bloomberg and S&P Global for companies in Hong Kong, South Korea, and the U.S., using Data Envelopment Analysis based on 2018 to 2021 data. Although Bloomberg's ESG scores were higher than S&P Global's as raw scores before Data Envelopment Analysis, the results after the analysis revealed a completely different picture. Furthermore, the fact that both organizations' ESG scores correlate with net income and that regression analysis shows that companies with better financial results also have higher ESG scores demonstrates a strong positive relationship between ESG ratings and financial performance, even across different organizations. If we were to provide a general assessment of the studies, only a limited number compare ESG methodologies in the context of financial performance. Analysing only companies in the critical sector may help explain the disagreement in prior academic research, which generally presents conflicting evidence on the link between ESG scores and financial performance across ESG methodologies (Gyönyörová et al., 2023). In addition, investors and

academics who base their decisions on a single ESG rating agency should exercise caution (Conway, 2019). Finally, it should not be forgotten that an excessive focus on ESG scores can lead to poor financial performance (Wu et al., 2024). On the other hand, in ESG methodologies that may differ in approach, profitability within the financial performance framework can serve as a key indicator of ESG assurance (Balan et al., 2026). Additionally, there are cases in which ESG scores calculated using different methodologies have the same effect on financial performance (Oshchepkova, 2019).

Given the limited number of studies comparing ESG methodologies with financial performance, our study, based on current data, aims to address this gap in the literature. The comparison of ESG methodologies was conducted within the framework of the effect of ESG scores on financial performance, focusing on three organizations: LSEG, S&P Global, and CSR HUB. One unique aspect of this study is that it conducts a three-way comparison of the ESG scores measured by these organizations, which are typically analyzed in head-to-head comparisons of their effects on financial performance.

Numerous studies on the measurement of financial performance predominantly use accounting- and market-based financial ratios. In studies examining the relationship between ESG scores and financial performance, ratios such as ROA, ROE, net profit margin, and Tobin's Q are frequently used as indicators of financial performance. In our study, contrary to what is commonly addressed in the literature, we aim to evaluate the importance and effectiveness of financial ratios that serve as indicators of financial performance in the context of the studies by Bilgin and Yılmaz (2025), De Lucia, Pazienza, and Bartlett (2020), and Öner and Çinko (2026). The use of the MEREC-MARCOS methods to weight and rank specific financial ratios to examine the effect of ESG scores on financial performance is another unique feature of this study and aligns with this aim. This allows for a more accurate measurement of financial performance.

In applying this method, Abdullayev and Çokmutlu (2025); Apan and Özdil (2025); Çilek (2022); Ivanović, Saha, Stević, Puška, and Zavadskas (2022); Şeyranlioğlu, Kara, and Çilek (2024); Sezgin and Aytekin (2024); Taşçi (2024) and Yavuz (2024), the financial ratios were first weighted using the MEREC method. Subsequently, using the financial ratios with their determined weights, the studies by Altıntaş (2022); Çilek (2023); Çınaroğlu (2021); Gençtürk, Senal, and Aksoy (2021); Koç (2025); Karataş and Çetin (2026); and Ürgüp (2021) calculated a financial performance score using MARCOS to determine the ranking. In addition to studies where the MEREC and MARCOS methods were used separately, there are also studies where they were used together, such as those by Ayçin and Arsu (2022); Ersoy (2022); Ersen, Akyüz, and Akyüz (2025); Kara (2026); Kargı (2025); Simic, Gokasar, Devci, and Švadlenka (2024); Sezgin, Aytekin, and Sakarya (2024); Štilić, Puška, Božanić, and Đurić (2024) and Sehgal et al. (2025).

METHODOLOGY, DATA, AND HYPOTHESES

The purpose of this study is to determine the effect of ESG scores, an indicator of sustainability accounting practices, on financial performance within the scope of BIST (Istanbul Stock Exchange) companies. Thus, a sample was selected from businesses in Türkiye, which falls into the category of developing countries where sustainability accounting practices are frequently discussed.

ESG scores were obtained from LSEG data for 2024 and from S&P Global and CSR HUB data for 2025. These three ESG rating agencies do not calculate ESG scores for all companies listed on the BIST; this is the most significant factor affecting the number of companies included in the study. Additionally, companies operating in the banking, real estate investment trust, and insurance sectors within the BIST were excluded from the study due to differences in the structure of their financial statements, which prevented them from meeting the comparability criteria. In the final stage, to ensure that comparisons between ESG methodologies are accurate and comprehensive, the assessment must be based on the same sample (companies). For this reason, since the number of companies rated by all three rating agencies included in the study was 58, the sample size was selected accordingly. The flowchart for sample selection is presented in Figure 1.

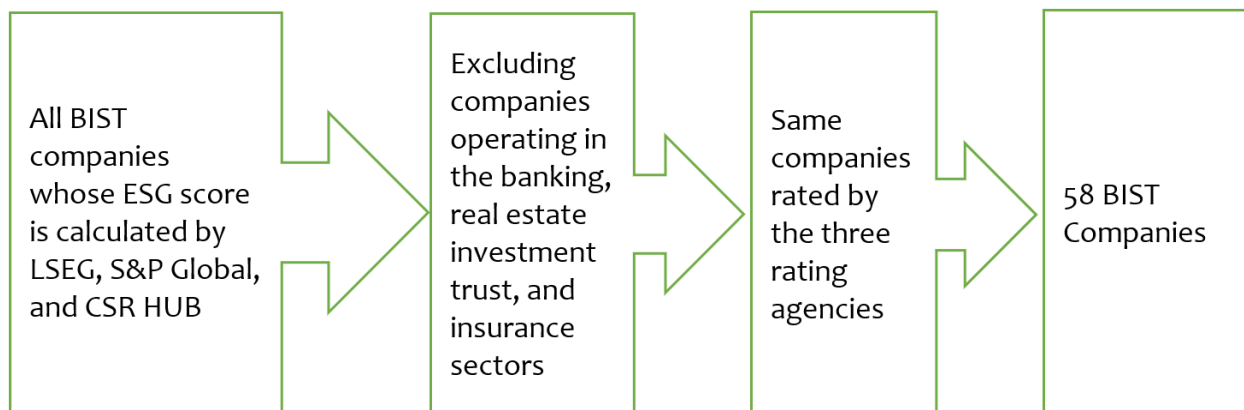


Figure 1: Sample Selection Flowchart

The most recent ESG scores calculated by LSEG were based on data from the 2024 financial statements. This is also the case for the ESG scores calculated by S&P Global and CSR HUB, which are based on the 2025 financial statements. This is the reason for using data from different years. This difference does not result in any information asymmetry. The purpose is to conduct research based on current data. The ESG scores publicly disclosed by the three ESG rating agencies on their respective websites were used within the study's limitations. Information on the measurement topics considered by these three ESG rating agencies is presented in Table 2.

Table 2: Comparison of ESG Methodologies

Criteria	LSEG	S&P Global	CSR HUB
"Score Range"	0-5	0-100	0-100
"Environmental"	"Climate Transition" "Energy & Resource Use" "Biodiversity" "Water Use" "Waste & Pollution"	"Biodiversity" "Climate Strategy" "Decarbonization Strategy" "Energy" "Environmental Policy & Management" "Packaging" "Product Stewardship" "Sustainable Forestry Practices" "Sustainable Raw Materials" "Waste & Pollutants" "Water"	"Energy & Climate Change" "Environment Policy & Reporting" "Resource Management"
"Social"	"Labor Relations" "Health & Safety" "Human Rights & Community"	"Community Relations" "Contribution to Societal Healthcare" "Customer Relations" "Financial Inclusion" "Health & Nutrition" "Human Capital Management" "Human Rights" "Labor Practices" "Occupational Health & Safety" "Privacy Protection" "Transportation Safety"	"Community Dev & Philanthropy" "Human Rights & Supply Chain" "Product" "Compensation & Benefits" "Diversity & Labor Rights" "Training, Safety & Health"

Criteria	LSEG	S&P Global	CSR HUB
"Governance"	"Board & Management" "Shareholder Rights" "Conduct & Anti-Corruption" "Tax Transparency & Accounting"	"Business Ethics" "Corporate Governance" "Information Security/Cybersecurity & System Availability" "Innovation Management" "Market Opportunities" "Materiality" "Policy Influence" "Product Quality & Recall Management" "Risk & Crisis Management" "Supply Chain Management" "Sustainable Finance" "Tax Strategy" "Transparency & Reporting"	"Board" "Leadership Ethics" "Transparency & Reporting"

Source: <https://www.lseg.com/en/data-analytics/sustainable-finance/sustainability-ratings-and-data>,
<https://www.spglobal.com/sustainable/en/solutions/esg-scores-data>,
<https://www.csrhub.com/csrhub-esg-data-schema> Retrieved from websites (Access Date: 01.05.2026)

While LSEG and S&P Global use their own methodologies for calculating ESG scores, CSR HUB calculates ESG scores by normalizing, weighting, and combining raw data collected from hundreds of independent data sources (from many organizations that calculate ESG scores).

The financial performance of enterprises was measured in this study using the MEREC-MARCOS approach, an MCDM method. When using the approach, the financial ratios chosen to measure financial success were first given internal weights using MEREC. The aim was to reduce the influence of subjective evaluations and achieve an objective approach (Kara, 2026). When using MEREC to "objectively determine the weight of a criterion, that criterion is set aside, and the resulting change in the sum of the weights of the other criteria is examined" (Apan & Özdil, 2025). The MEREC application steps proposed by Keshavarz-Ghorabae, Amiri, Zavadskas, Turskis, and Antucheviciene (2021) are as follows:

First Step: "Creating a decision matrix"

"A decision matrix consisting of m alternatives and n criteria is constructed using Equation 1."

$$X = [x_{ij}]_{n \times m} \quad (1)$$

Second Step: "Normalization of the decision matrix"

"The decision matrix is normalized based on whether the criteria are benefit-oriented or cost-oriented. Equation 2 represents the benefit-oriented aspect, while Equation 3 represents the cost-oriented aspect."

$$n_{ij} = \frac{\min_k x_{kj}}{x_{ij}}, \quad j \in B \quad (2)$$

$$n_{ij} = \frac{x_{ij}}{\max_k x_{kj}}, \quad j \in C \quad (3)$$

Third Step: "Calculating the overall performance scores of the alternatives"

"The total performance values of the alternatives, S_i , are calculated as shown in Equation 4 by applying a logarithmic scale and weighting them equally."

$$S_i = \ln \left(1 + \frac{1}{m} \sum_{j=1}^m |\ln(n_{ij})| \right) \quad (4)$$

Fourth Step: "Recalculating alternative performances when each criterion is removed"

"The performance of each alternative S'_{ij} is determined by removing each criterion individually from the decision matrix. Accordingly, when the j . criterion is removed, the performance score of the i . alternative is calculated as shown in Equation 5. The term A_{ij} in Equation 5 represents the absolute logarithmic sum of the criterion values normalized by excluding the j . criterion, as defined in Equation 6."

$$S'_{ij} = \ln \left(1 + \frac{1}{m} A_{ij} \right) \quad (5)$$

$$A_{ij} = \sum_{k=1}^{j-1} |\ln(n_{ik})| + \sum_{k=j+1}^m |\ln(n_{ik})| \quad (6)$$

Fifth Step: "Calculating the effects of removing criteria"

"In this step, the total value of the absolute deviations is calculated. The calculation of the removal effect of the E_j criterion is shown in Equation 7."

$$E_j = \sum_{i=1}^n |S'_{ij} - S_i| \quad (7)$$

Sixth Step: "Obtaining the final criterion weights"

"In the final step, the exclusion effects (E_j) calculated in Step 5 are normalized, and the objective weights of the criteria (w_j) are calculated as shown in Equation 8."

$$w_j = \frac{E_j}{\sum_{k=1}^m E_k} \quad (8)$$

For each company in the study, an overall financial performance score was determined using the MARCOS method, based on objectively weighted financial ratios. Developed by Stević, Pamučar, Puška, and Chatterjee (2020), MARCOS "defines the relationship between ideal and anti-ideal alternatives, determines their utility functions, and establishes a compromise ranking" (Karataş & Çetin, 2026). "Here, the utility functions indicate the position of each alternative relative to the ideal and anti-ideal solutions, and the alternative closest to the ideal and farthest from the anti-ideal is considered the best alternative" (Stević et al., 2020). Thanks to its flexible structure, MARCOS enables analysis of a large number of criteria; its simple algorithmic framework mitigates complexity even when the number of alternatives and criteria is high; and it offers numerous advantages for optimizing multiple objectives simultaneously (Ecer, 2020). The MARCOS application stages outlined by Stević et al. (2020) are as follows:

First Step: "Creation of the initial decision matrix"

"The decision matrix is constructed based on m alternatives and n criteria, as shown in Equation 9."

$$D = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \quad (9)$$

Second Step: "Creating an expanded decision matrix"

"By adding the ideal and anti-ideal solutions, the alternatives are prepared for joint analysis based on the worst-case and best-case values. An expanded decision matrix is constructed, as shown in Equation 10."

$$X = \begin{bmatrix} x_{aa1} & x_{aa2} & \cdots & x_{aan} \\ x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \\ x_{ai1} & x_{ai2} & \cdots & x_{ain} \end{bmatrix} \quad (10)$$

"Anti-ideal and ideal solution values are determined based on the direction of the criterion. For benefit-oriented criteria Equation 11, the anti-ideal solution has the minimum value, while the ideal solution has the maximum value. For cost-oriented criteria Equation 12, however, the anti-ideal solution has the maximum value, while the ideal solution has the minimum value."

$$AAI_j = \min_i x_{ij} \quad (11)$$

$$AAI_j = \max_i x_{ij} \quad (12)$$

Third Step: "Normalization of the expanded decision matrix"

"The normalized decision matrix is obtained using Equation 13 for benefit-oriented criteria and Equation 14 for cost-oriented criteria."

$$n_{ij} = \frac{x_{ai}}{x_{ij}}, \quad j \in C \quad (13)$$

$$n_{ij} = \frac{x_{ij}}{x_{ai}}, \quad j \in B \quad (14)$$

Fourth Step: “Obtaining the weighted normalized matrix”

“The values of the expanded normalized decision matrix, weighted by the criteria’s importance weights, are multiplied as shown in Equation 15, and the relative importance levels of the criteria are incorporated into the process by constructing a weighted normalized matrix.”

$$v_{ij} = n_{ij} \cdot w_j \quad (15)$$

Fifth Step: “Calculating the utility levels of alternatives”

“In this step, to calculate the utility levels of each alternative relative to the anti-ideal and ideal solutions, the sum of the weighted normalized values for each alternative is first determined as shown in Equation 16. These sums are then compared with the reference solutions as shown in Equations 17 and 18.”

$$S_i = \sum_{j=1}^n v_{ij} \quad (16)$$

$$K_i^- = \frac{S_i}{S_{aai}} \quad (17)$$

$$K_i^+ = \frac{S_i}{S_{ai}} \quad (18)$$

Sixth Step: “Calculating the utility functions of alternatives”

“To calculate the value of the utility function, the utility functions corresponding to the anti-optimal and optimal solutions are first determined, as shown in Equations 19 and 20, respectively.”

$$f(K_i^-) = \frac{K_i^+}{K_i^+ + K_i^-} \quad (19)$$

$$f(K_i^+) = \frac{K_i^-}{K_i^+ + K_i^-} \quad (20)$$

“The utility function, which expresses the trade-off between the observed alternative and the ideal and anti-ideal solutions, is calculated as shown in Equation 21.”

$$f(K_i) = \frac{K_i^+ + K_i^-}{1 + \frac{1-f(K_i^+)}{f(K_i^+)} + \frac{1-f(K_i^-)}{f(K_i^-)}} \quad (21)$$

Seventh Step: “Listing the alternatives”

“The alternatives are ranked from highest to lowest based on the final values of the utility functions. The alternative with the highest $f(K_i)$ value is considered the optimal alternative.”

Table 3 presents the financial ratios used in our study to assess firms’ financial performance using the MEREC-MARCOS methods, along with the weights calculated with MEREC.

Table 3: Financial Ratios Used for Measuring Financial Performance

Ratio type	Financial ratio	Type of criteria	Weight (2024)	Weight (2025)	References
Profitability Ratios	“ROA (Net Profit / Total Assets)”	Benefit (Max)	0.124	0.125	Apan and Özdil (2025); Yavuz (2024); Taşçı (2024) and Çilek (2022)
	“ROE (Net Profit / Total Equity)”	Benefit (Max)	0.125	0.125	Apan and Özdil (2025) Yavuz (2024); Taşçı (2024) and Çilek (2022)
	“Net Profit Margin (Net Profit / Total Sales)”	Benefit (Max)	0.124	0.126	Abdullayev and Çokmutlu (2025); Apan and Özdil (2025); Medetoğlu (2024) and Çilek (2022)
Liquidity Ratios	“Current Ratio (Current Assets / Short-Term Liabilities)”	Benefit (Max)	0.119	0.117	Karataş and Çetin (2026); Koç (2025); Medetoğlu (2024) and Ürgüp (2021)
	“Liquidity Ratio (Current Assets - Inventory / Short-Term Liabilities)”	Benefit (Max)	0.118	0.117	Karataş and Çetin (2026); Koç (2025); Taşçı (2024) and Ürgüp (2021)
Efficiency and Operation Ratios	“Asset Turnover Ratio (Net Sales / Average Total Assets)”	Benefit (Max)	0.124	0.117	Karataş and Çetin (2026); Koç (2025); Taşçı (2024) and Sezgin et al. (2024)

Ratio type	Financial ratio	Type of criteria	Weight (2024)	Weight (2025)	References
Financial Structure Ratios	“Inventory Turnover Ratio (Cost of Goods Sold / Average Inventory)”	Benefit (Max)	0.113	0.118	Abdullayev and Çokmutlu (2025); Bozdoğan, Odabas, and Çetin (2023); Ürgüp (2021)
	“Leverage Ratio (Total Liabilities / Total Assets)”	Cost (Min)	0.007	0.007	Abdullayev and Çokmutlu (2025); Sezgin et al. (2024); Bozdoğan et al. (2023); and Ürgüp (2021)
	“Debt-to-Equity Ratio (Total Liabilities/Total Equity)”	Cost (Min)	0.013	0.019	Karataş and Çetin (2026); Apan and Özdil (2025); Abdullayev and Çokmutlu (2025) and Ürgüp (2021)
Market-Based Ratios	“Tobin Q Ratio ([Market Value + Total Liabilities] / Total Assets)”	Benefit (Max)	0.117	0.112	Ürgüp (2021) and Sezgin and Aytekin (2024)
	“Market-to-Book Ratio (Market Value / Book Value)”	Cost (Min)	0.016	0.017	Ersen et al. (2025); Şeyranlıoğlu et al. (2024); Sezgin and Aytekin (2024) and Ürgüp (2021)

The financial ratios used in the MEREC-MARCOS methods were obtained from the Yahoo Finance website.

Correlation and regression analyses were used to compare different ESG methodologies in terms of their effects on companies’ financial performance, based on ESG scores obtained from LSEG, S&P Global, and CSR HUB in this study. The hypotheses tested through these analyses are as follows:

H₁: The LSEG ESG score significantly affects the MEREC-MARCOS-based financial performance score.

H₂: The S&P Global ESG score significantly affects the MEREC-MARCOS-based financial performance score.

H₃: The CSR HUB ESG score significantly affects the MEREC-MARCOS-based financial performance score.

H₄: The explanatory power of ESG scores for financial performance varies depending on the ESG data provider.

FINDINGS

The findings of all statistical analyses performed are presented in this section of the study. The study includes 58 BIST companies whose data are suitable for analysis. Descriptive statistics of the calculated scores related to ESG and financial performance are presented in Table 4.

Table 4: Descriptive Statistics

Variables	N	Mean	Standard Deviation	Min.	Median	Max.	Skewness	Kurtosis
LSEG_ESG	58	2.7914	0.8219	0.3	2.85	4.4	-0.9757	1.4501
SP_ESG	58	46.9483	17.4129	10.0	43.5	86.0	0.1738	-0.2125
CSR_ESG	58	73.069	23.6115	12.0	81.5	99.0	-1.2412	0.7053
MARCOS_2024	58	0.4314	0.1098	0.1981	0.4252	0.6707	0.2586	-0.3542
MARCOS_2025	58	0.43	0.1092	0.178	0.4253	0.6543	-0.1347	-0.5011

The fact that the number of observations is 58 for all variables indicates that the analyses were conducted using the same sample of firms. The mean of the LSEG_ESG variable was calculated as 2.7914; the mean of the SP_ESG variable was 46.9483; and the mean of the CSR_ESG variable was 73.0690. The fact that ESG scores are reported on different scales indicates that the rating systems used by data providers differ. For this reason, ESG scores were not directly evaluated on the same scale; instead, a separate regression model was established for each data provider. In terms of financial performance indicators, the MARCOS_2024 average is 0.4314, while the MARCOS_2025 average is 0.4300. These values indicate that the integrated financial performance scores calculated for the two periods are quite close in terms of central tendency. When examining skewness and

kurtosis, LSEG_ESG and CSR_ESG show negative skewness, whereas MARCOS_2024 and MARCOS_2025 exhibit more balanced distributions. Descriptive statistics are important for revealing the general structure of the variables before proceeding to correlation and regression analyses.

The test results regarding the normal distribution of the variables are presented in Table 5.

Table 5: Normality Test Results

Variables	Shapiro-Wilk	p-value	Skewness	Kurtosis	Evaluation
LSEG_ESG	0.9332	0.0033	-0.9757	1.4501	The assumption of normal distribution is rejected.
SP_ESG	0.9786	0.3958	0.1738	-0.2125	The assumption of normal distribution cannot be rejected.
CSR_ESG	0.8484	0.0	-1.2412	0.7053	The assumption of normal distribution is rejected.
MARCOS_2024	0.9804	0.4694	0.2586	-0.3542	The assumption of normal distribution cannot be rejected.
MARCOS_2025	0.9891	0.8801	-0.1347	-0.5011	The assumption of normal distribution cannot be rejected.

The results of the Shapiro–Wilk test, together with the skewness and kurtosis values, are presented in Table 5 to assess whether the variables satisfy the assumption of normality. According to the Shapiro–Wilk test results, the p-value was calculated as 0.0033 for the LSEG_ESG variable and 0.0000 for the CSR_ESG variable. These findings indicate that the assumption of normal distribution is rejected for these two variables. In contrast, for the SP_ESG, MARCOS_2024, and MARCOS_2025 variables, the p-values are greater than 0.05; therefore, the assumption of normal distribution cannot be rejected. These findings reveal that not all variables in the dataset share the same distributional characteristics. Therefore, instead of the parametric Pearson correlation, the Spearman rank correlation, which is less sensitive to the assumption of normality, was preferred for the correlation analysis. However, since the distribution of the model residuals rather than the normal distribution of the variables themselves is of primary importance, regression assumption tests were also conducted in the regression analyses. The results of the Spearman rank correlation test are presented in Table 6. In addition, the heat map of the ESG scores and the MEREC-MARCOS scores is presented in Figure 2.

Table 6: Spearman Correlation Analysis Results

Variables	LSEG_ESG	SP_ESG	CSR_ESG	MARCOS_2024	MARCOS_2025
LSEG_ESG	1.000***	0.779***	0.708***	0.337***	0.220*
SP_ESG	0.779***	1.000***	0.754***	0.250*	0.138
CSR_ESG	0.708***	0.754***	1.000***	0.311**	0.156
MARCOS_2024	0.337***	0.250*	0.311**	1.000***	0.379***
MARCOS_2025	0.220*	0.138	0.156	0.379***	1.000***

Note: * 10% significance level, ** 5% significance level, *** 1% significance level

The results of the Spearman correlation analysis examining the preliminary relationships among the variables are presented in Table 6. Spearman's correlation is an appropriate analytical method when the assumption of normality is not satisfied for all variables, as it accounts for ranked relationships among variables. According to the findings, the ESG scores exhibit positive and statistically significant relationships with one another. The correlation coefficient between LSEG_ESG and SP_ESG was calculated as 0.779; between LSEG_ESG and CSR_ESG, as 0.708; and between SP_ESG and CSR_ESG, as 0.754. These results indicate a high degree of similarity among ESG scores from different providers, although the scores do not represent the same information. Regarding the relationship between ESG scores and financial performance variables, LSEG_ESG shows a positive and statistically significant relationship with MARCOS_2024.

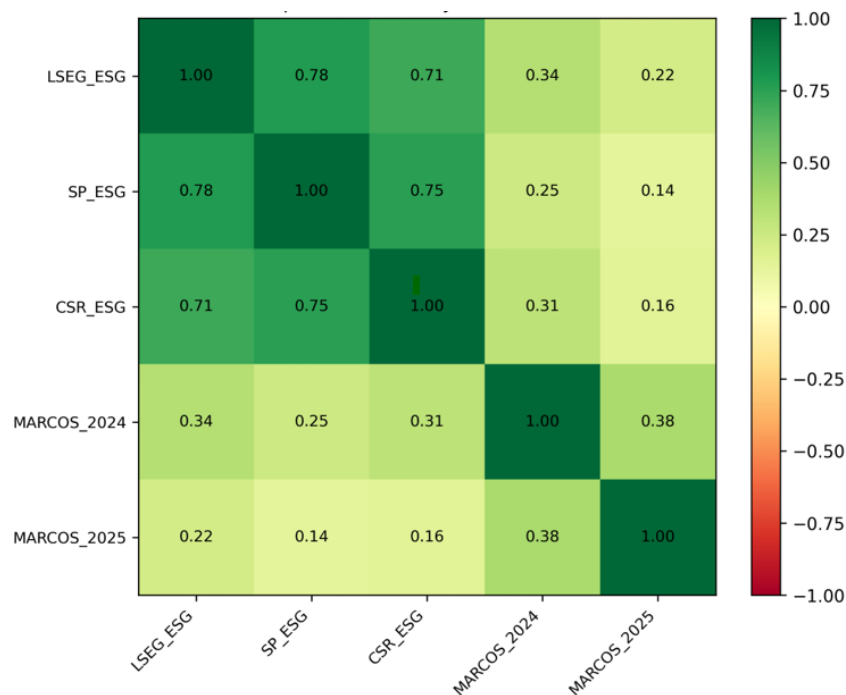


Figure 2: Correlation Heat Map of ESG Scores and MEREC-MARCOS Scores

The coefficient of this relationship is 0.337. The correlation coefficients between SP_ESG and MARCOS_2025 are 0.138, and between CSR_ESG and MARCOS_2025 are 0.156; however, these relationships are not statistically significant. Therefore, the correlation findings indicate that the most pronounced preliminary relationship with financial performance emerges for the LSEG ESG score. Nevertheless, since correlation analysis only indicates the direction and strength of the relationships between variables, regression analysis was employed to assess the explanatory effect.

Before presenting the regression analysis results, the regression hypothesis test results are shown in Table 7.

Table 7: Regression Hypothesis Tests

Models	Shapiro-Wilk p	Breusch-Pagan p	Max. Cook's D	Max. Std. Residual	Standard Error Type
Model 1 LSEG ESG Score → MARCOS_2024	0.1131	0.7085	0.1362	2.3202	OLS
Model 2 S&P Global ESG Score → MARCOS_2025	0.5788	0.9607	0.1533	2.388	OLS
Model 3 CSR HUB ESG Score → MARCOS_2025	0.865	0.5659	0.2345	2.5311	OLS

Table 7 presents the key assumption tests for the three established regression models. In the regression models, the normality of the residuals was assessed using the Shapiro-Wilk test, heteroscedasticity was evaluated using the Breusch-Pagan test, and the risk of influential outliers was examined using Cook's Distance and standardized residual values. The Shapiro-Wilk p-values for Model 1, Model 2, and Model 3 were calculated as 0.1131, 0.5788, and 0.8650, respectively. Since these values are greater than 0.05, they indicate that the residuals do not violate the assumption of normality in any of the models. The Breusch-Pagan test results were also above 0.05 for all three models. This finding indicates that no heteroscedasticity problem was detected in the models. The fact that the maximum Cook's Distance values remain below 1 indicates that there are no highly influential outliers that excessively affect the regression results. The fact that the absolute values of the standardized residuals remain below the threshold of 3 also supports the conclusion that there is no serious

problem with outlying residuals. Therefore, it was decided to use OLS standard errors in all three models. Overall, the assumption tests indicate that the regression models are interpretable and statistically acceptable.

The regression analysis results for Model 1 (LSEG ESG Score → MARCOS_2024) are presented in Table 8 and Figure 3.

Table 8: Model 1 Regression Results: LSEG ESG Score → MARCOS_2024

Variables	Coefficient	Std. Error	t	p-value	Under 95%	Top 95%	Significance
Constant	0.3114	0.0491	6.3365	0.0	0.2129	0.4098	***
LSEG_ESG	0.043	0.0169	2.5441	0.0137	0.0091	0.0768	**

Note: ** 5% significance level, *** 1% significance level

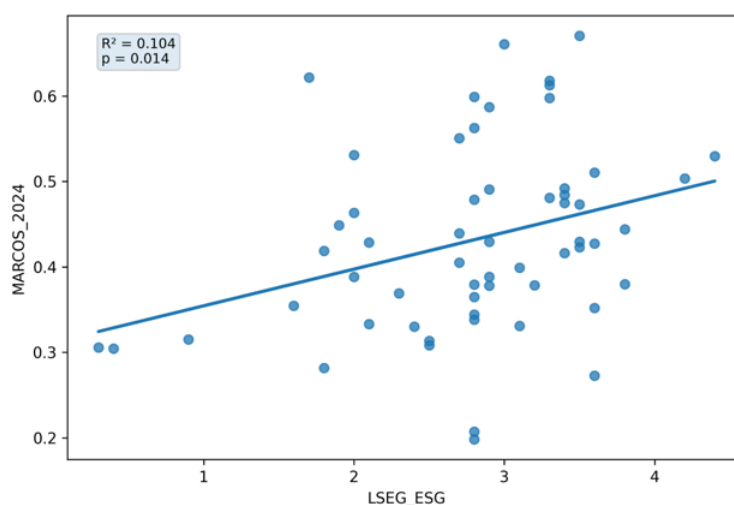


Figure 3: Relationship between LSEG ESG Score and MARCOS_2024

Table 8 shows the results of the simple linear regression model testing the effect of the LSEG_ESG variable on MARCOS_2024. The constant term was calculated as 0.3114 and was found to be statistically significant in the model. The coefficient for LSEG_ESG is 0.0430, with a p-value of 0.0137. These results indicate that the LSEG ESG score has a positive and statistically significant effect on the MARCOS_2024 financial performance score. The positive coefficient indicates that an increase in the LSEG ESG score tends to improve firms' 2024 financial performance score calculated using the MEREK-MARCOS methods. The lower bound of the 95% confidence interval is 0.0091, and the upper bound is 0.0768, indicating that the coefficient does not include zero and that this effect is statistically supported. This finding reveals that, for the year 2024, the LSEG ESG score is a significant indicator affecting financial performance.

The regression analysis results for Model 2 (S&P Global ESG Score → MARCOS_2025) are presented in Table 9 and Figure 4.

Table 9: Model 2 Regression Results: S&P Global ESG Score → MARCOS_2025

Variables	Coefficient	Std. Error	t	p-value	Under 95%	Top 95%	Significance
Constant	0.3727	0.0411	9.0646	0.0	0.2903	0.4551	***
SP_ESG	0.0012	0.0008	1.4845	0.1433	-0.0004	0.0029	

Note: *** 1% significance level

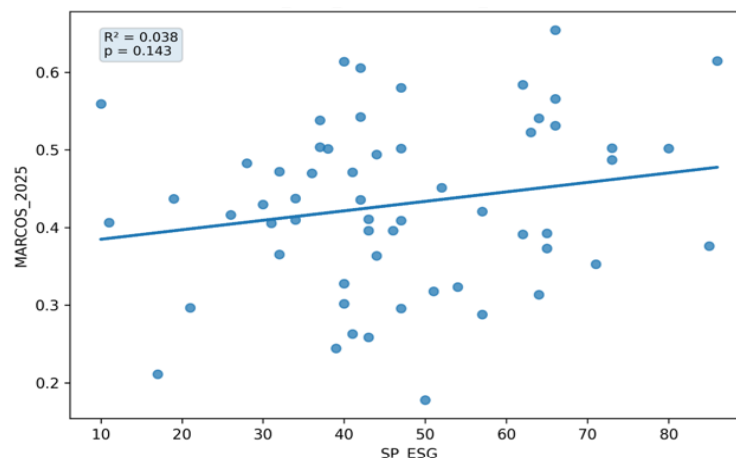


Figure 4: Relationship between S&P Global ESG Score and MARCOS_2025

Table 9 shows the results of the regression model testing the effect of the S&P Global ESG score on MARCOS_2025. The constant term was estimated at 0.3727 and was found to be statistically significant in the model. The coefficient of the SP_ESG variable is 0.0012. The positive coefficient indicates a positive relationship between the S&P Global ESG score and the 2025 financial performance score. However, since the p-value is 0.1433, this effect is not statistically significant. Furthermore, the 95% confidence interval (-0.0004 to 0.0029), which includes zero, supports the conclusion that the SP_ESG coefficient does not have a statistically reliable explanatory effect. Therefore, based on the findings of Model 2, the S&P Global ESG score did not have a statistically significant effect on financial performance in 2025.

The regression analysis results for Model 3 (CSR HUB ESG Score → MARCOS_2025) are presented in Table 10 and Figure 5.

Table 10: Model 3 Regression Results: CSR HUB ESG Score → MARCOS_2025

Variables	Coefficient	Std. Error	t	p-value	Under 95%	Top 95%	Significance
Constant	0.3655	0.0465	7.8525	0.0	0.2722	0.4587	***
CSR_ESG	0.0009	0.0006	1.4549	0.1513	-0.0003	0.0021	

Note: *** 1% significance level

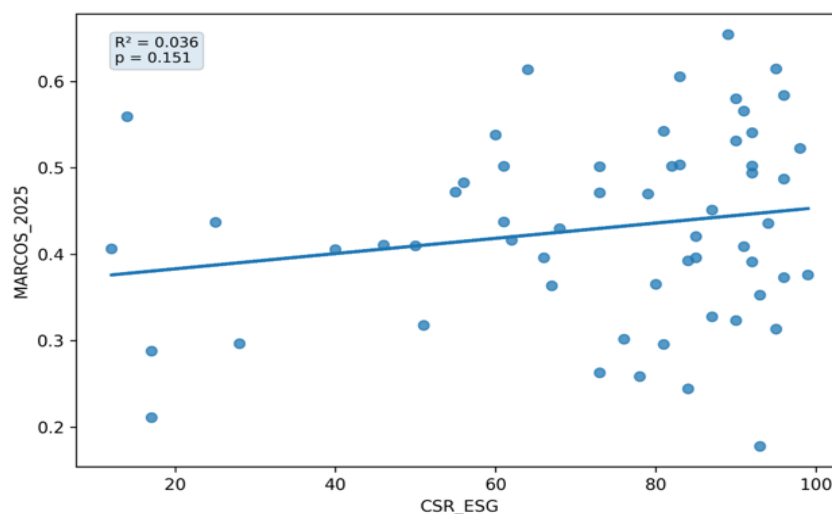


Figure 5: Relationship between CSR HUB ESG Score and MARCOS_2025

Table 10 shows the results of the regression model testing the effect of the CSR HUB ESG score on MARCOS_2025. The constant term was estimated at 0.3655 and is statistically significant in the model. The coefficient of the CSR_ESG variable is 0.0009. Although this coefficient is positive, its p-value is 0.1513. Therefore, the effect of the CSR HUB ESG score on the MARCOS_2025 financial performance score is not statistically significant. This result is further supported by the 95% confidence interval, which ranges from -0.0003 to 0.0021 and includes zero. These findings indicate that in 2025, the CSR HUB ESG score does not have a statistically significant effect on financial performance.

The results of the tests assessing the explanatory power of the regression models are presented in Table 11.

Table 11: Comparison of the Disclosure Power of ESG Data Providers

Models	Relationship	β	p-value	R ²	Adjusted R ²	F	F-p-value	Std. Error Type
Model 1	LSEG ESG Score → MARCOS_2024	0.043	0.0137	0.1036	0.0876	6.4722	0.0137	OLS
Model 2	S&P Global ESG Score → MARCOS_2025	0.0012	0.1433	0.0379	0.0207	2.2038	0.1433	OLS
Model 3	CSR HUB ESG Score → MARCOS_2025	0.0009	0.1513	0.0364	0.0192	2.1169	0.1513	OLS

Table 11 compares the explanatory power of the regression models for the three ESG data providers. The comparison considers the beta coefficient, p-value, R², adjusted R², F-statistic, and F p-value. In Model 1, the LSEG ESG score has a positive and significant effect on the MARCOS_2024 variable. The model has an R² value of 0.1036 and an adjusted R² value of 0.0876. These results indicate that the LSEG ESG score explains approximately 10.36% of the variation in the 2024 MEREC-MARCOS financial performance score. In Model 2, the explanatory power of the S&P Global ESG score for MARCOS_2025 is more limited. In this model, the R² value is 0.0379, and the p-value is 0.1433. Similarly, in Model 3, the explanatory power of the CSR HUB ESG score for MARCOS_2025 is also low, with an R² value of 0.0364 and a p-value of 0.1513. When these results are evaluated together, it is evident that, among the three ESG data providers, the strongest and most statistically significant explanation of financial performance is provided by the LSEG ESG score. Although the S&P Global and CSR HUB ESG scores have positive coefficients, neither is statistically significant. Therefore, within the scope of this study, it can be concluded that the explanatory power of ESG scores for financial performance varies across ESG data providers.

CONCLUSION

The classical view that the primary goal of businesses is maximum profit has been replaced in recent years by the concept of sustainability, which prioritizes social interests. This shift has influenced the field of accounting, making sustainability accounting practices an important topic. These practices were previously evaluated based on criteria such as environmental expenditures or inclusion in sustainability indices. Today, however, ESG scores calculated by various organizations have emerged as a new metric in the literature. The purpose of this study is to determine the effect of businesses' sustainability accounting practices on financial performance by comparing different ESG methodologies. To this end, ESG scores calculated by LSEG for 2024 and by S&P Global and CSR HUB for 2025 were subjected to correlation and regression analyses together with financial performance scores calculated using the MEREC-MARCOS methods. When the analyses are evaluated overall, it is evident that the relationship between ESG scores and MEREC-MARCOS financial performance scores varies across data providers. The correlation analysis showed that the ESG scores have strong positive relationships with one another. In contrast, the regression results revealed that only the LSEG ESG score has a statistically significant and positive effect on financial performance. Although the S&P Global and CSR HUB ESG scores yielded positive coefficients, neither was statistically significant. This finding indicates that the methodological

differences among ESG rating agencies are also reflected in their relationship with financial performance. The findings suggest that the relationship between firms' sustainability accounting practices and financial performance should not be generalized based on a single ESG score, and that evaluating different data providers separately is likely to yield more reliable results. If the status of the hypotheses is evaluated, it can be stated that the findings support H_1 "The LSEG ESG score significantly affects the MEREC-MARCOS-based financial performance score" and H_4 "The explanatory power of ESG scores on financial performance varies depending on the ESG data provider." On the other hand, it can be said that the findings do not support H_2 "The S&P Global ESG score significantly affects the MEREC-MARCOS-based financial performance score" and H_3 "The CSR HUB ESG score significantly affects the MEREC-MARCOS-based financial performance score."

The findings of the study appear consistent with those of De Lucia et al. (2020), which weighted financial performance ratios using specific techniques within the framework of the effect of LSEG ESG scores. In the context of developing countries, the findings of this study are also similar to those reported by Bodhanwala and Bodhanwala (2018); Bahadori et al. (2021); Jyoti and Khanna (2021); and Naeem et al. (2021), all of whom found that LSEG ESG scores positively affect financial performance indicators. Furthermore, consistency was also observed with the results of studies by Velte (2017); Ting et al. (2020); Aydoğmuş et al. (2022) and Chen et al. (2023), which examined developed countries or countries worldwide. Within the framework of BIST companies, it was found that the results of this study are consistent with the studies conducted by Özer et al. (2023) and Bilgin and Yılmaz (2025) but are not consistent with the studies conducted by Çakmak and Çalis (2024) and Öner and Çinko (2026). In general, the finding that LSEG ESG scores positively affect financial performance, identified in most studies, was similarly confirmed in this study. Regarding the effect of S&P Global ESG scores on financial performance, the finding of no significant relationship is consistent with the study by Zumente and Lâce (2022). Within the scope of BIST companies, it can be stated that the findings of this study do not align with the significant positive or negative results identified in the studies conducted by Çetin et al. (2024); Karyağdı and Şit (2023); and Yıkılmaz (2022), or with those reported by Chau et al. (2025); Rao and Juma (2024); and Yadav et al. (2025) in the context of developing countries or different countries. Regarding the effect of CSR HUB ESG scores on financial performance, the finding of no significant relationship is consistent with the studies conducted by Markhaichuk (2017); Mišura et al. (2018) and McAdoo (2020). It has been observed that this result is inconsistent with the findings of studies by Arminen et al. (2018); Kooskora et al. (2019); Volkova and Kuznetsova (2022); and Zhuang et al. (2023) across different countries and sectors. Within the ESG methodologies examined in this study, the inconsistency with previous findings may be attributed to studies in the literature conducted across different countries, sectors, and time periods. Within the framework of comparing ESG methodologies, the studies conducted by Oshchepkova (2019); Conway (2019); Freitas and Crisóstomo (2021); and Balan et al. (2026) generally found consistency among the ESG organizations being compared. However, as stated in the supported H_4 hypothesis of this study, the explanatory power of ESG scores for financial performance varies across ESG data providers. As discussed by Berg et al. (2022) and Gyönyörövá et al. (2023), this difference can be attributed to the varying rating methodologies used to measure ESG scores across industry sectors and countries.

The findings from this study confirm the literature's conclusion that ESG scores generally have a positive effect on financial performance, as observed within the LSEG framework. However, a neutral effect was observed, contrary to the positive effect reported in the literature within the S&P Global and CSR Hub frameworks. These results suggest a theoretical framework indicating that one should not rely solely on a single ESG rating agency when assessing the effect of ESG scores on financial performance. Since the findings apply to Türkiye, which is classified as a developing nation, generalizations within this category are warranted, and additional studies can be carried out across other industries and with ESG rating agencies.

One unique aspect of this study is its examination of the current effect of sustainability accounting practices on financial performance through a three-way comparison of ESG methodologies. This is because previous studies have mostly involved a two-way comparison, and the ESG scores provided by CSR HUB have not been examined in the Turkish context. In addition, another original aspect of the study is that, beyond the profitability ratios most commonly used to measure firms' financial performance in the literature investigating

the effect of ESG scores, different financial ratios, classified according to their characteristics, are weighted and ranked using the MEREC-MARCOS methods and consolidated into a single score. In practical terms, managers can use ESG scores to assess the international visibility of their sustainability-related expenditures and initiatives. In addition, they can analyse their effect on financial performance to inform their decisions and take appropriate actions. Public authorities, for their part, can monitor companies' sustainability policies using ESG scores measured by various rating agencies and use these scores as criteria when drafting regulations on the subject. Future studies on this subject could contribute to the literature by examining ESG scores in general or separately as the E, S, and G components across different rating agencies, and by comparing methodologies across sectors or countries, not only for financial performance but also across different variables.

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TRANSPARENCY: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

COMPETING INTERESTS: The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS: Both authors contributed equally to the conception and design of the study. Both authors have read and agreed to the published version of the manuscript.

DISCLOSURE OF AI USE: The author(s) used DeepL and OpenAI's ChatGPT to improve the language and overall clarity. All outputs were reviewed and verified by the authors.

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