

## Article

# The Impact of Sustainability Performance on Financial Performance: Does Firm Size Matter? Evidence from Turkey and South Korea

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**Abstract:** This study investigated the effect of sustainability performance on financial performance in developed and developing countries. It also aimed to determine the moderator effect of firm size. The factor for sustainability performance was listed in the BIST Sustainability Index for Turkey and the Dow Jones Sustainability Korea Index for South Korea. ROE, ROA, ROS, and MV/BV were used as financial performance factors. Companies included in the KOSPI 100 index for South Korea and the BIST 100 index for Turkey were examined. Panel regression analysis and Generalized Method of Moments (GMM) analysis were performed to determine the effect of the past value of financial performance factors on their current value. The results show that the impact of sustainability performance on financial performance differs between South Korea and Turkey. In addition, the moderator variable has a significant effect only on ROA (return on assets) for Turkey and on ROE (return on equity) and ROS (return on sales) for South Korea. The results of the GMM analysis show that the past ROA and ROE values affect the current values statistically and positively for South Korea. For Turkey, the past ROE, ROS, and MV/BV (Market Value/Book Value) positively affect the current values. In addition to theoretical implications, implications for policy-makers and practitioners are also presented. Finally, this study provides significant insights for decision-makers and policy-makers to improve sustainability and corporate responsibility in financial and other similar settings.

**Keywords:** sustainability performance; financial performance; BIST sustainability index; Dow Jones Sustainability Korea Index; firm size



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## 1. Introduction

In recent years, concerns and awareness regarding protecting the future environment have significantly increased, and continue to increase. These rapidly increasing concerns and awareness have brought about the concept of sustainability [1]. Sustainability is a vital issue for many companies worldwide and emphasizes the impact of companies on the physical environment, social environment, nature, and society [2]. To maintain sustainability, businesses need to carry out their activities by focusing on economic benefits without harming the environment and by positively contributing to the social structure [3]. This situation has brought about a significant increase in interest in the non-financial performance of companies in recent years [4]. Non-financial performance includes environmental (emission reductions, eco-efficient product design), social (job security, human rights-oriented business environment), and managerial (fair and effective stakeholder relations) elements [5] and governance [6]. Companies focus on improving their processes and ways of doing business by considering environmental and social impacts [7]. With the adoption of sustainability by companies, environmental programs such as Corporate

Social Responsibility, corporate governance, the green value chain, green production and minimizing water consumption have begun to be implemented [8].

Sustainability-oriented practices within companies are the most critical indicators of their sustainability performance. In other words, this performance is the extent to which companies integrate sustainability into their activities and processes [5]. Companies must create sustainable value, achieve their environmental goals, and balance economic and social benefits. In this way, firms can generate long-term returns by reducing risks and attracting new investors and shareholders [6]. However, regardless of the importance of sustainability in terms of increasing corporate success and reputation, providing a competitive advantage, and creating long-term value, there is no definite consensus on whether there is a relationship between the sustainability performance of the companies included in sustainability indexes and their financial performance [9]. In some studies, a positive relationship was found between sustainability performance (SP) and financial performance (FP) [10–12], while a negative relationship was found in other studies [13–15], and some studies did not find a significant relationship [16,17].

The relationship between SP and FP has been investigated, mainly focusing on firms in developed countries [18–22]. There are also studies specific to companies in developing countries [12,23–25]. Although there are many studies on sustainability performance, there is still a need for research on sustainability performance specific to regions and sectors. For example, South Korea is an important country to examine with regard to its sustainability performance from a regional perspective. The main reason for this is that although South Korea ignored its sustainability performance before the 2000s, necessary steps were subsequently taken to measure sustainability performance in the country, especially after 2010. One of them is the Korean Sustainability Index (KSI), published by the Korean Standards Association in 2010. KSI is based on the ISO 26000 standard and is considered a robust indicator of the relationship between SP and FP, as it offers sustainability performance scores ranging from 0 to 100 [26]. Turkey's initiatives for sustainability performance are relatively new. The most important of these initiatives is the BIST Corporate Sustainability Index (XUSRD). XUSRD, a robust indicator of sustainability performance in Turkey, has been published since 2014. In this respect, the measurement of sustainability performance in Turkey began more recently than in South Korea. Therefore, there are two important reasons for selecting Turkey and South Korea. The first is to compare a country that has focused on sustainability performance for many years with a country that focused on sustainability performance more recently. The second is to investigate the SP–FP relationship from a regional perspective with the focus of Asian and European countries. It is also vital to examine companies in developed and developing countries together regarding the SP–FP relationship, and as far as we know from the literature, the number of studies investigating this is limited.

This study aimed to investigate the SP–FP relationship with a focus on companies operating in South Korea and Turkey. In addition, the moderator effect of firm size on this relationship was examined. It was analyzed whether the past value of financial performance factors affects their current value. The study is organized as follows. In the second part, the theoretical background for sustainability reporting is mentioned. In the third part, studies examining the SP–FP relationship are explained. In the fourth part, hypotheses are given. The research methodology is explained in the fifth section. The findings are given and discussed in the sixth section, and managerial implications are made. Finally, conclusions and limitations of the research are given in the seventh section, and suggestions for further research are made.

## 2. Theoretical Background for Sustainability Reporting

This section explains stakeholder, agency, and legitimacy theories as the basis of the hypotheses constructed. In general, ref. [27] indicated that the agency theory proposed by [28] and the stakeholder theory proposed by [29] are the two dominant theories for sustainability reporting.

### 2.1. Stakeholder Theory

According to [29], stakeholder theory accepts value generation as the main driving force for business. According to the theory, profit is an essential indicator of daily operation. Profit and financial performance are possible outcomes of the value-creation process. However, the theory reveals that this value should be created with a focus on shareholders and managers in the context of stakeholders [30]. The behaviors of stakeholder groups can have a restrictive effect on practices that enable managers to map corporate resources to their environment efficiently. At this point, the firm's main objective is to balance the conflicting demands of the stakeholders [31]. Firms share their non-financial indicators with a large group of stakeholders to demonstrate their interest in the environment and society, and in this way, they are rewarded in the market [32]. This theory sees firms as organizations that can achieve the divergent goals of multiple and diverse stakeholders [33]. Stakeholder theory can be studied from descriptive, instrumental, and normative perspectives. The descriptive approach reveals how the concepts correspond. The instrumental approach explains the relationship between stakeholder management and corporate performance. By contrast, the normative approach reveals stakeholder behaviors and the factors that trigger these behaviors [33].

### 2.2. Agency Theory

One party (the principal) may delegate to another party (the agent) decision-making and control over specific tasks or activities. The agency theory focuses on examining the problems arising from this delegation of authority [34]. In the 1980s, this theory was recognized as an essential paradigm in financial economics, primarily focusing on the relationship between managers and stockholders [35]. According to the theory, the principal and the agent cooperate, but both parties have different goals and attitudes regarding risk [34]. The theory deals with the economic relationship between the principal and agent under the constraints of risk sharing, information asymmetry, and uncertainty [36]. Therefore, it is crucial to monitor the activities of the agent to harmonize the principal's and the agent's objectives, minimize potential conflicts, and thereby increase the shareholders' income [27]. However, these interferences can be costly and empirical evidence for their effectiveness is insufficient [37]. Regarding sustainability reporting, the focal point of the theory is the relationship between shareholders (the principal) and managers (the agent). While managers make decisions based on their interests, shareholders intend to adopt strategies to increase firm value [32].

### 2.3. Legitimacy Theory

Legitimacy is a resource that society dedicates to the firm, which the firm desires and depends on to continue its activities. It is a resource that is anticipated to be influenced by developing disclosure-related strategies compared to other firm resources [38]. Legitimacy theory argues that firms perform their activities within the norms and boundaries of society, and when these activities are considered necessary by society, these are shared with society in the form of reports [32]. The theory is accepted as a basis for firms to voluntarily disclose non-financial information. It assumes that sustainability disclosure made by low-performing firms is a legitimation tactic to influence society in evaluating the firm's sustainability performance [39]. According to this theory, which emphasizes the social contract between the firm and the organization, the performance of firms is legitimate in terms of social acceptance when it is supported by society [40]. The companies' values and the societal expectations should be compatible with each other. Otherwise, a legitimacy gap occurs, and the firm needs to manage and legitimize this gap. Regarding sustainability reporting, public disclosure of the company's environmental and social (non-financial) information effectively ensures legitimacy [41].

#### 2.4. Sustainability

Sustainability, which has evolved from corporate social responsibility and is a broad concept [42], means that the actions of individuals today do not reduce the social, economic, and environmental resources of future generations [43]. Therefore, it is possible to evaluate individuals' and companies' actions within the scope of sustainability [44]. In recent years, sustainability reports published by companies are regularly taking the place of environmental reports. Unlike environmental reports, sustainability reports cover non-financial aspects of companies' activities and practices, such as social and economic performance [45]. The fact that companies consider environmental impacts in their strategies and the decisions they take, and take measures to protect the environment, is related to their corporate sustainability performance [44]. Corporate sustainability performance generally includes the firm's managerial decision mechanism's environmental, social and economic elements [46]. Since the concept of sustainability includes all critical stakeholders, such as investors, the natural environment and society, stakeholders play an essential role in increasing sustainability performance [43]. Therefore, the firm's sustainability strategy aims to ensure long-term economic well-being, ecological sustainability, and social stability for all stakeholders [46].

In recent years, sustainability performance has become a standard for almost all companies worldwide, and there has been an increase in the number of reports on this performance [42]. The Global Reporting Initiative first published reporting guidelines, and many companies use the relevant guide to evaluate their sustainability performance. According to the guideline, corporate sustainability performance is an interconnected and integrated system with economic, social, and environmental dimensions [43]. Therefore, it is vital to ensure connection and balance between three elements for the system to function effectively: operational activities, effective management of stakeholders, and corporate finance understanding [44]. It is critical to understand the appropriate and accurate sustainability performance indicators [47].

Sustainability is challenging for companies that both consider their activities' economic, environmental and social impact on society and try to make a profit [5]. Sustainability efforts involve considering environmental and social issues and integrating them into the firm's management [48]. Sustainability performance can increase financial performance by increasing corporate reputation [49]. Financial performance is the financial situation as measured by solvency, profitability, capital adequacy and similar indicators within a certain period. Financial performance is the ability to manage and control resources effectively and efficiently [50]. Financial performance is essential for external users in terms of investment opportunities, while for internal users it is analyzed for the well-being and reputation of the firm [51]. Firms with high liquidity and financial performance are more inclined to make a statement on corporate social responsibility [52]. However, firms that fully implement corporate social responsibility are appreciated by many investors and respected by their customers [53]. At the same time, sustainable practices can positively affect financial and corporate performance in general [44]. Increasing sustainability performance can also increase a company's competitive power [54]. While this strategy has advantages for companies, it also has disadvantages [5]. Financial resources are used not only for operational activities but also for sustainability practices. Therefore, the cost of sustainability practices should be calculated, and priority should be given to the efficient use of resources [55]. Due to these interactions between the two concepts, it is essential to examine the relationship between corporate sustainability performance and financial performance [44]. At the same time, the interaction mentioned above reveals a bidirectional and interrelated relationship between the two concepts. In other words, carrying out sustainability practices by allocating financial resources is one aspect of the interaction, while the financial performance returns of sustainability practices are another aspect. Table 1 shows previous research on the relationship between sustainability and financial performance.

**Table 1.** Previous studies on the relationship between SP and FP.

Research	Sample Size	Measure of SP	Measure of FP
[56]	13	Environmental performance	Cash flow, ROE, ROA, net income
[57]	523	Toxic Release Inventory disclosure	Earnings per share
[11]	62	Discretionary social responsibility	ROS, ROA
[58]	140	Environmental orientation	Sales growth
[16]	289	CSR rating	Financial return and risk
[14]	179	Corporate social performance	Mrket return, ROE, ROA
[59]	87	Sustainability performance reports	ROA
[20]	418	DJSI North America membership	Market value
[60]	855	Environmental performance	ROA
[19]	89	CSR disclosure	Share price
[61]	394	Environmental performance disclosure	Stock returns (abnormal)
[62]	696	Environmental performance	Stock prices
[24]	73	ESG scores	Share price
[63]	385	ESGEP	Tobin's Q, ROA
[42]	456	CSP	lnQ
[64]	28	ESG combined score	ROCE, ROA, ROE
[65]	3701	Economic, environmental, social pillars, corporate governance pillar	Tobin's Q
[66]	2885	Refinitiv Eikon	ROA, ROE

According to Table 1, studies examining the relationship between SP and FP have a long history. Specifically in the last ten years, the number of studies has significantly increased. A wide variety of variables have been used as an indicator of SP. Most studies used environmental performance as an indicator of SP, while the most used variables as FP indicators were ROA and ROE. These variables were used together in many studies. In addition to ROA and ROE in the current study, MV/BV, preferred as an FP indicator in a limited number of studies in the literature, was used. In some studies, a positive relationship was found between SP and FP [7,10–12,18], while other studies found a negative one [13–15,56,57,67], and some studies did not find a significant impact [16,17,59]. Therefore, the current study makes some contributions to the literature. First, it reveals whether SP affects FP in developed and developing countries. It is crucial to determine this effect on companies' financial performance, since the legislation and laws on sustainability vary significantly among countries according to their level of development. The authors of [32] analyzed the impact of the sustainability performance of non-financial firms from India and Japan on their financial performance. The current research differs in that it examines the impact of the sustainability performance of financial firms in developed and developing countries on their financial performance. Second, four proxies, ROE, ROS, ROA, and MV/BV, are used for financial performance. Using ROA and ROE as financial performance indicators, ref. [68] analyzed the impact of the sustainability performance of the companies in the Dow Jones Sustainability Index Europe (DJSI Europe) on their financial performance. The current research differentiates by using ROS and MV/BV in addition to ROE and ROA, and the moderator effect of firm size is examined. In this way, it is possible to explain the impact of sustainability performance on different financial performance indicators. Third, both micro and macro variables are used together in the study. This way, it is tried to obtain more consistent and reliable results for both performance measurements. Fourth, up-to-date data on the sustainability performances of companies (2015–2021) is used so that it is possible to examine the long-term SP-FP relationship of companies in recent history. Fifth, besides the financial ratios of the companies, stock market indicators are also included in the analysis, and a multidimensional and large-scale evaluation of the financial performance is provided. Finally, we analyze the moderator effect of firm size regarding the four performance factors and present new theoretical evidence for developed and developing countries. The authors of [69] argued that sustainability investments are associated with significantly larger firm size. In addition, ref. [70] found that CSR reporting differs by company size, and large companies disclose more information. For this reason,



it is vital to analyze the moderator effect of firm size with a focus on developed and developing countries.

### 3. Hypothesis Development

The main hypothesis of the research is theoretically built on the instrumental stakeholder theory. Freeman's stakeholder theory strategically reveals the impact of the firm's environment on its success, viability, and structure through stakeholder identification [71]. Shareholders focus on current and future financial benefits; neo-classical shareholders focus only on financial performance. In recent years, there has been an increase in shareholder groups focused on social performance. According to the theory, corporate social performance is costly and involves meeting stakeholder demands [72]. Companies' intangible social responsibility can affect their reputation and cash flow. In other words, when it is considered that a company is not fulfilling its social and environmental responsibilities, the relationship of the company with its stakeholders, reputation, and cash flows may be adversely affected [73]. The social performances of companies will also help them gain a competitive advantage, but this will only be possible by transferring the company's sensitivity to social and environmental issues to its stakeholders [5]. Firms with high corporate sustainability performances are less likely to experience revenue losses [18]. Based on the above-mentioned theoretical arguments, the first hypothesis was constructed as follows:

**H1.** *Sustainability performance has an impact on financial performance.*

Regarding environmental laws and regulations, developed countries have a more strict attitude than developing countries. In addition, the influence of stakeholders on the firm is more significant in developed countries than in developing countries [12]. However, it is understood that research results from firms in developed and developing countries are broadly similar. For example, research has been conducted on US firms [11,16], Canadian firms [45], Finnish firms [74], European firms [18], UK firms [19], Canadian and US firms [20], Greek firms [21], Japanese firms [22] and North American firms [73] from the perspective of developed countries. Meanwhile, studies have been conducted on UAE firms [25], Brazilian firms [24], South African firms [10], and Turkish firms [12,23] specific to emerging countries. In all of the mentioned studies, a positive relationship was found between sustainability and financial performance. Based on these arguments, the second hypothesis was constructed as follows:

**H2.** *Sustainability performance has an impact on financial performance in developed and developing countries.*

Large-sized firms have a particular reputation in the industry. The sustainability activities of small firms can have more significant impacts and are more vital to the firms. However, small-sized companies have problems accessing resources, and their sustainability activities can increase their interactions and ties with other stakeholders [26]. According to the agency theory, as a firm grows, there is a greater need for external funds, and this triggers a conflict of interest between three groups, namely, the managers, the creditors and the shareholders. Agency costs in large-sized firms are higher, and information asymmetry is greater. Therefore, they are more likely to disclose information on sustainability activities [75]. According to the legitimacy theory, large firms feel pressure to carry out their activities to legitimize their business. Therefore, large firms operate more extensively and have a greater social impact [76]. Legitimacy theory argues that large firms are subject to greater public scrutiny and face tremendous pressure to inform the public in order to obtain support to help them survive [77]. Therefore, ref. [69] argued that as companies grow, their investments in sustainability practices and programs increase. In addition, the authors claimed that firm size is an essential determinant of sustainability performance, as large firms have the potential to create economies of scale in their sustainability activities. The authors of [78] asserted that large firms could more easily employ trained personnel to carry out and review plans for sustainability practices. In addition, they are able to

overcome the pressures of various stakeholder groups, primarily consumers, shareholders, and non-governmental organizations, in order to move towards sustainability. The authors of [79] argued that larger firms have more resources, so they are more likely to voluntarily engage in sustainability practices to ensure effective stakeholder relationship management, legitimacy and trust. Small firms, on the other hand, tend to use their limited resources primarily to improve financial performance. However, it is stated that companies direct their resources to sustainability activities, provided that they positively impact their performance [78]. Based on the above-mentioned theoretical arguments and research findings, the last hypothesis was constructed as follows:

**H3.** *Firm size moderates the relationship between sustainability performance and financial performance in developed and developing countries. For large-sized companies, this relationship is positively sloped.*

#### 4. Methodology

This study investigates the effect of sustainability performance on financial performance, focusing on companies operating in South Korea and Turkey. Data for both countries between 2015 and 2021 were used. The initial year of 2015 was determined because the BIST Corporate Sustainability Index (XUSRD) has been published since November 2014. It was determined that 46 companies (excluding banks, insurance companies, and REITs) were operating continuously in the BIST 100 Index during these periods. In addition, 48 companies were included in the model in the KOSPI 100 Index in South Korea when applying the same criteria. The data set of the companies included in the BIST 100 Index was obtained from the financial statements published on its public disclosure platform [80]. The data set of the companies in the South Korean KOSPI 100 Index was calculated with the data obtained from [81]. Turkey's gross domestic product per capita was taken from the Turkish Statistical Institute (TUIK) database. South Korea's macro variable was obtained from Macrotrends's website. The following sections give the variables and then the research model.

##### 4.1. Variables

Four dependent variables were used as financial performance indicators. While the return on assets (ROA), return on equity (ROE) and return on sales (ROS) were the accounting-based performance indicators, the market-to-book value ratio (MV/BV) was the market-based performance indicator. In addition, macro and micro variables were used as independent variables. Current ratio (CR), capital intensity (CI), financial leverage ratio (LEV), firm size (SIZE), moderator variable ( $SP \times SIZE$ ) and rate of change in sales (CS) were used as micro variables. In addition, a dummy variable that takes the values 0 and 1 for whether the companies are included in the Borsa Istanbul Corporate Sustainability Index (XUSRD) and South Korea Sustainability Index KRW was obtained. Finally, the gross domestic product per capita of Turkey and South Korea was used as a macro variable. The definitions of and references for all variables are given in Table 2.

**Table 2.** Description and sources for Variables.

Variables	Description	Source
<b>Dependent Variables</b>		
ROA	Net Profit/Total Assets	KAP/SPGLOBAL
ROE	Net Profit/Equity	KAP/SPGLOBAL
ROS	Net Profit/Sales	KAP/SPGLOBAL
MV/BV	Market Value/Book Value	KAP/SPGLOBAL

Table 2. Cont.

Variables	Description	Source
<b>Independent Variables</b>		
CR	Current Assets/Short-Term Liabilities	KAP/SPGLOBAL
CI	Fixed Asset/Net Sales	KAP/SPGLOBAL
LEV	Total Debt/Total Assets	KAP/SPGLOBAL
SP	A dummy variable equals “1” if the firm is in the BIST XUSRD index during the sample period, “0” o.w. A dummy variable equals “1” if the firm is in the KOSPI KRW index during the sample period, “0” o.w.	KAP/SPGLOBAL
SIZE	Natural logarithm of total assets	KAP/SPGLOBAL
CS	$\frac{\text{This year's value of Net Sales} - \text{The previous year's value of Net Sales}}{\text{Previous Year's Value of Net Sales}}$	KAP/SPGLOBAL
GDP	Logarithm of the Gross Domestic Product per Capita	TUİK/Makrotends
SP × SIZE	SP Dummy variable × Natural logarithm of total assets	KAP/SPGLOBAL

#### 4.2. Research Model

Three regression models were established to determine the effect of sustainability performance on financial performance indicators. The first equation is as follows:

$$ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CI_{it} + \beta_3 LEV_{it} + \beta_4 SP_{it} + \beta_5 SIZE_{it} + \beta_6 CS_{it} + \beta_7 LGDP_{it} + \beta_8 SP * SIZE_{it} + \varepsilon_{it} \quad (1)$$

The model's ratio of net profit to total assets (ROA) is an accounting-based performance indicator. First, the effect of the companies in the sustainability index on the return on assets was examined. Second, SP was used as a dummy variable, and the companies included in the index were given a value of 1 and the others a value of 0. In addition, the effects of current ratio (CR), capital intensity (CI), financial leverage (LEV), firm size (SIZE), change in sales (CS), moderator variable (SP × SIZE) and per capita gross domestic product on return on assets are estimated in the first equation. In the model, *i* represents the cross-section, and *t* represents the time.  $\varepsilon_{it}$  shows the error correction coefficient. The second equation in the study is as follows:

$$ROE_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CI_{it} + \beta_3 LEV_{it} + \beta_4 SP_{it} + \beta_5 SIZE_{it} + \beta_6 CS_{it} + \beta_7 LGDP_{it} + \beta_8 SP * SIZE_{it} + \varepsilon_{it} \quad (2)$$

In the model, ROE represents the return on equity.

$$ROS_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CI_{it} + \beta_3 LEV_{it} + \beta_4 SP_{it} + \beta_5 SIZE_{it} + \beta_6 CS_{it} + \beta_7 LGDP_{it} + \beta_8 SP * SIZE_{it} + \varepsilon_{it} \quad (3)$$

In the model, ROS represents the return on sales. The final equation established with the market-based performance indicator is as follows:

$$MV/BV_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CI_{it} + \beta_3 LEV_{it} + \beta_4 SP_{it} + \beta_5 SIZE_{it} + \beta_6 CS_{it} + \beta_7 LGDP_{it} + \beta_8 SP * SIZE_{it} + \varepsilon_{it} \quad (4)$$

### 5. Findings and Interpretation

In this section, first of all, descriptive statistics are given. Afterward, empirical results are discussed, and theoretical and managerial implications are made.

#### 5.1. Descriptive Statistics

The descriptive statistics for the variables calculated between 2015–2021 in Turkey and South Korea are shown in Table 3. There are 336 observations in the data sets created between 2015–2021 for 48 companies in Turkey and 322 observations for 46 companies in South Korea. The variable with the highest mean in Turkey is SIZE, and the variable with the lowest is ROA. The variable with the lowest standard deviation is MV/BV. In South Korea, the variable with the highest mean is LGDP, and the variable with the highest standard deviation is MV/BV.

There are 336 observations in the data sets created between 2015–2021 for 48 companies in Turkey and 322 observations for 46 companies in South Korea. The variable with the highest mean in Turkey is SIZE, and the variable with the lowest is ROA. The variable with



the lowest standard deviation is MV/BV. In South Korea, the variable with the highest mean is LGDP, and the variable with the highest standard deviation is MV/BV.

**Table 3.** Descriptive statistics.

Var.	Turkey					South Korea				
	Obs.	Mean	Std. Dev	Min.	Max	Obs.	Mean	Std. Dev	Min.	Max
ROA	336	0.0758	0.0811	−0.2090	0.4330	322	0.0425	0.0694	−0.3540	0.3195
ROE	336	0.1591	0.3027	−1.3156	2.5940	322	0.0588	0.2638	−2.2779	3.1291
ROS	336	0.1356	0.1905	−0.4800	1.2130	322	0.1298	1.1748	−2.1638	20.8697
MV/BV	336	1.9733	2.7268	−8.8511	23.1586	322	23.1838	27.9085	0.2695	206.2192
CR	336	2.1526	2.3714	0.3800	14.9126	322	1.8166	1.4189	0.1008	8.9524
CI	336	1.1343	1.5281	0.0111	18.7219	322	1.8830	5.4926	0.2214	63.1876
LEV	336	0.5648	0.2402	0.0779	1.1665	322	0.4090	0.2075	0.0298	1.0934
SP	336	0.4702	0.4998	0.0000	1.0000	322	0.5217	0.5003	0.0000	1.0000
CS	336	0.2790	0.3543	−0.5643	3.1753	322	0.0846	0.3083	−0.9486	2.2277
SIZE	336	22.3560	1.5376	19.0379	25.5630	322	0.0962	0.2813	−0.4271	3.3844
GDP	336	9.2047	0.0893	9.0591	9.3133	322	31,656	2068.986	28,732	35,196

Two tests were performed to determine whether there is a linear relationship between the independent variables in the three models. The first of these tests was the Variance Inflation Factor (VIF) test, which was used to determine whether there is a multicollinearity problem between the variables. If the VIF value exceeds 10, that is,  $R_j^2$  exceeds 0.90, it is stated that there is a multicollinearity problem [82]. Correlation analysis was the second analysis to test the linear relationship between the variables. The multicollinearity test and correlation test results of Turkey and South Korea are summarized in Tables 4 and 5.

**Table 4.** Correlation analysis for Turkey.

	CR	CI	LEV	SE	CS	SIZE	LGDP	VIF
CR.	1.0000							1.97
CI	−0.0955 (0.0804)	1.0000						1.20
LEV	−0.6766 * (0.0000)	0.0559 (0.3072)	1.0000					2.04
SP	−0.2948 * (0.0000)	0.0846 (0.1215)	0.3611 * (0.0000)	1.0000				1.81
CS	−0.0096 (0.8609)	0.3175 * (0.0000)	0.0634 (0.2465)	0.0660 (0.2279)	1.0000			1.13
SIZE	−0.1147 ** (0.0355)	0.2302 * (0.0000)	0.2878 * (0.00000)	0.6230 * (0.0000)	0.1138 ** (0.0370)	1.0000		1.88
LGDP	0.0033 (0.9520)	−0.0279 (0.6110)	−0.0709 (0.1950)	−0.2131 * (0.0001)	−0.119 ** (0.0404)	−0.2778 * (0.0000)	1.0000	1.10

Note: \* and \*\* denote 1% and 5% significance levels, respectively.

**Table 5.** Correlation analysis for South Korea.

	CR	CI	LEV	SE	CS	SIZE	LGDP	VIF
CR	1.0000							1.98
CI	0.1653 * (0.0029)	1.0000						1.23
LEV	−0.6610 * (0.0000)	−0.1134 ** (0.0421)	1.0000					1.89
SP	−0.1774 * (0.0014)	0.0058 (0.9177)	−0.0432 (0.4400)	1.0000				1.10
CS	−0.0371 (0.5070)	0.2292 * (0.0000)	−0.0631 (0.2589)	0.1063 ** (0.0568)	1.0000			1.66
SIZE	−0.0403 (0.4706)	0.3936 * (0.0000)	0.0109 (0.8457)	−0.0069 (0.9014)	0.6107 * (0.0000)	1.0000		1.83
LGDP	0.0104 (0.8529)	−0.0181 (0.7468)	−0.0047 (0.9335)	0.0000 (0.0000)	0.0536 (0.3374)	−0.0273 (0.6252)	1.0000	1.01

Note: \* and \*\* denote 1% and 5% significance levels, respectively.

The negative correlation between the LEV-CR independent variables is the highest for both countries. When VIF values are examined, the values of the independent variables are below the critical value, and there is no multicollinearity problem for both countries. Correlations between independent variables for both countries are below the threshold value, and the results are suitable for further analysis.

## 5.2. Analysis

In the study, four regression models were established to determine the effect of sustainability on firm performance. These models were tested with panel data regression analysis. The panel data regression model was estimated using the least-squares method and fixed-effects and random-effects models. The F test and Hausman test were performed to determine which of these three estimators was the appropriate regression model. The F test was performed to determine whether the fixed-effects model or the least-squares model should be used in the established regression model. The hypothesis tested for the F test is whether the “ $H_0$ : No unit and/or time effect” form is established. The authors of [83] developed a test to decide between the random- and fixed-effects models. The Hausman test is known as the random-effects or variance components model in the panel data regression model. In the test, it is analyzed whether there is no correlation between the error term  $\varepsilon_{it}$  and the explanatory variable  $X_{it}$  [83]. Therefore, the null hypothesis is “The difference in coefficients is not systematic”. Table 6 shows the panel regression analysis results and the estimator selection results.

According to the F test results of the four models established for Turkey and South Korea, the null hypothesis is rejected (Table 6). In other words, the fixed effects model is the appropriate estimator. In addition, the Hausman test was used to decide on the fixed-effects or random-effects regression estimator. As a result of the test, it was decided to use the random-effects regression model. The results of the random effects regression model performed with the dependent variables ROA, ROE, ROS and MV/BV are summarized in Table 6.

The four models established according to the random effects regression estimator for Turkey and South Korea are statistically significant. The capital intensity, firm leverage, firm size and per capita gross domestic product of the companies in BIST 100 statistically and negatively affect the return on assets. A one-unit increase in CI, LEV, SIZE and LGDP reduces ROA. The fact that the companies are in the sustainability index also negatively affects return on assets and is statistically significant at 1%. Therefore, H1 and H2 are partially accepted. The asset profitability of the companies included in the BIST 100 and the sustainability index is decreasing. The  $SP \times SIZE$  moderator variable has a significant and positive effect on return on assets. Firm size has a moderator effect on the impact of the SP dummy variable on return on assets. The asset profitability of large companies included in the sustainability index is increasing. According to Model 2, the effect of capital intensity on return on equity is negative and statistically significant at 1%. The change in sales significantly and positively affects the return on equity. Other independent variables do not affect the return on equity. In the results of the regression model based on the ROS, it is determined that the current ratio and the change in sales have a positive and significant effect on the ROS. The effect of CI, LEV and GDP on the ROS is statistically significant and negative. In addition, the  $SP \times SIZE$  moderator variable does not affect the ROS. In other words, the inclusion of companies in the sustainable index and the size of the companies do not affect the ROS. In the MV/BV regression model, the effects of CI and GDP on the market performance indicator are negative and significant. It is found that changes in leverage ratio and sales increase firms' MV/BV ratio.

Table 6. Panel regression analysis results.

Country	Turkey				South Korea			
Model	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
FP Proxy	ROA	ROE	ROS	MV/BV	ROA	ROE	ROS	MV/BV
CR	0.0021 (0.443)	0.0040 (0.749)	0.0148 ** (0.023)	0.0801 (0.489)	−0.0107 * (0.004)	0.0077 (0.665)	−0.0697 *** (0.088)	0.0573 (0.303)
CI	−0.0215 * (0.000)	−0.0417 * (0.002)	−0.0260 * (0.000)	−0.2232 ** (0.043)	−0.0012 ** (0.040)	−0.0015 (0.625)	0.0659 * (0.000)	−0.0101 (0.245)
LEV	−0.1231 * (0.000)	0.0134 (0.914)	−0.2983 * (0.000)	3.8978 * (0.000)	−0.2435 * (0.000)	−0.1181 (0.345)	−0.2154 (0.426)	0.5680 (0.185)
SP	−0.2361 * (0.007)	−0.7242 (0.313)	−0.1563 (0.640)	6.5264 (0.272)	−0.0077 (0.504)	0.0859 *** (0.074)	−0.1547 *** (0.093)	0.1182 (0.620)
CS	0.0526 * (0.000)	0.1364 * (0.002)	0.1707 * (0.000)	1.0577 * (0.004)	0.0302 * (0.007)	−0.0025 (0.964)	0.0505 (0.768)	0.0355 (0.514)
SIZE	−0.0116 ** (0.014)	−0.0223 (0.313)	0.0055 (0.625)	0.3073 (0.124)	0.1114 * (0.000)	0.4380 * (0.000)	0.3969 (0.248)	0.0755 (0.804)
LGDP	−0.1370 * (0.000)	−0.1494 (0.398)	−0.2090 * (0.011)	−4.4470 * (0.002)	−0.0009 (0.981)	−0.1124 (0.566)	−0.03487 (0.582)	1.6347 * (0.001)
SP × SIZE	0.0103 *** (0.077)	0.0324 (0.302)	0.0071 (0.626)	−0.3120 (0.231)	−0.0379 (0.118)	−0.2854 * (0.022)	2.3427 * (0.000)	−0.0023 (0.994)
Constant	1.6594 * (0.000)	2.0120 (0.272)	−0.4589 (0.740)	33.9798 ** (0.030)	0.1661 (0.670)	1.1883 (0.558)	3.7568 (0.567)	−14.6861 * (0.004)
F Test	7.82 * (0.0000)	3.16 * (0.000)	5.76 * (0.0000)	5.54 * (0.0000)	4.81 * (0.000)	3.19 * (0.0000)	1.74 * (0.0040)	15.24 * (0.0000)
Hausman Test	9.70 (0.2866)	7.54 (0.4792)	12.48 (0.1311)	10.41 (0.2372)	6.55 (0.4774)	5.04 (0.6545)	6.03 (0.5358)	3.64 (0.8207)
Wald Chi <sup>2</sup> Prob.	110.52 * 0.0000	17.12 ** 0.0289	140.43 * 0.0000	55.71 * 0.0000	185.12 0.0000	26.92 0.0007	514.56 0.0000	14.92 0.0607
R <sup>2</sup>	0.5119	0.1543	0.5201	0.0642	0.4851	0.0453	0.6098	0.0175

Note: \*, \*\* and \*\*\* denote 1%, 5% and 10% significance levels, respectively.

The results of the regression models conducted for South Korea are as follows. CO, CI and LEV ratios statistically significantly and negatively affect the return on assets. The change in sales and firm size statistically significantly and negatively affect the return on assets. The SP dummy variable and SP × SIZE moderator variable do not affect the return on assets. In the second model, the SP dummy variable and SIZE have a statistically significant and positive effect on return on equity. Hence, the return on equity of the companies included in the sustainable index is increasing. In addition, the ROE of companies with large assets in the BIST 100 index is increasing. However, as the asset size of the companies included in the sustainability index increases, their return on equity decreases. The current ratio and SP dummy variable have a negative effect on ROS. If the companies are included in the sustainability index, ROS decreases. Therefore, SP × SIZE has a positive effect on ROS. The ROS of the large companies included in the sustainable index is increasing. Thus, H3 is partially accepted. In the last model, an increase in gross domestic product per capita increases companies' MV/BV ratio. Other independent variables did not have a statistically significant effect on MV/BV.

After static panel regression analysis, the models were reestimated with a Generalized Method of Moments (GMM) dynamic panel using first difference estimators. While estimating the model as a dynamic model, the lagged value of the dependent variable was included in the model as an independent variable. The primary purpose is to determine whether past performance indicators affect companies' current performance indicators. The estimators from [84] are used as GMM estimators in the study. This method makes the most of all linear moment constraints resulting from the assumption that the error term is uncorrelated, with no other exogenous variables in the lagged values of the dependent variable. The models handle all independent variables internally, and lagged values are used as

GMM-type tools. In addition, the second-order correlation and Sargan over-identification constraints results based on GMM residues are obtained via this method [84].

The models established for the GMM estimator expressed as a dynamic panel regression model are as follows.

$$ROA_{it} = \beta_1 ROA_{it-1} + \beta_2 CR_{it} + \beta_3 CI_{it} + \beta_4 LEV_{it} + \beta_5 SP_{it} + \beta_6 SIZE_{it} + \beta_7 CS_{it} + \beta_8 LGDP_{it} + \beta_9 SP * SIZE_{it} + \varepsilon_{it} \quad (5)$$

$$ROE_{it} = \beta_1 ROE_{it-1} + \beta_2 CR_{it} + \beta_3 CI_{it} + \beta_4 LEV_{it} + \beta_5 SP_{it} + \beta_6 SIZE_{it} + \beta_7 CS_{it} + \beta_8 LGDP_{it} + \beta_9 SP * SIZE_{it} + \varepsilon_{it} \quad (6)$$

$$ROS_{it} = \beta_1 ROS_{it-1} + \beta_2 CR_{it} + \beta_3 CI_{it} + \beta_4 LEV_{it} + \beta_5 SP_{it} + \beta_6 SIZE_{it} + \beta_7 CS_{it} + \beta_8 LGDP_{it} + \beta_9 SP * SIZE_{it} + \varepsilon_{it} \quad (7)$$

$$MV/BV_{it} = \beta_1 MV/BV_{it-1} + \beta_2 CR_{it} + \beta_3 CI_{it} + \beta_4 LEV_{it} + \beta_5 SP_{it} + \beta_6 SIZE_{it} + \beta_7 CS_{it} + \beta_8 LGDP_{it} + \beta_9 SP * SIZE_{it} + \varepsilon_{it} \quad (8)$$

The results from the four models established are given in Table 7.

In dynamic regression models, AR1 and AR2 autocorrelation tests are used to determine the “ $H_0$ : There is no serial correlation” hypothesis. The null hypothesis is accepted in all models established for Turkey and South Korea. In other words, there is no autocorrelation problem in the models. Although there is first-degree autocorrelation (AR1) in the ROS and MV/BV models in Turkey and the ROA and ROE models in South Korea, the results are not inconsistent since there is no second-order autocorrelation problem. However, due to the Sargan test, instrument variables are valid in both countries; in other words, over-definition constraints are invalid.

According to the results of the GMM estimator for Turkey, the dependent variable of the previous year’s return on assets does not affect the current period’s return on assets. The increase or decrease in the return on assets of the companies in the previous year does not affect the return on assets in the current year. Capital intensity and leverage ratio negatively and significantly affect the return on assets. The fact that companies are included in the sustainability index reduces their asset profitability. The increases in sales and in the gross domestic product per capita increase the return on assets.  $SP \times SIZE$ , the moderator variable, has a statistically significant and positive effect on return on assets. The ROE value one year ago has a statistically significant and negative effect on the current period ROE. An increase in the return on equity in the past period reduces the return on equity in the current period. While the change in sales negatively affects the return on equity, the asset size positively affects the return on equity. It was found that past ROS and MV/BV variables had a positive and statistically significant effect on current ROS and MV/BV. The increase in capital intensity reduces both ROS and MV/BV. While the leverage ratio has a negative effect on ROS, it positively affects MV/BV. It is determined that firm size has a statistically significant positive effect on ROS and MV/BV.

According to the results of the South Korean GMM estimator, the previous year’s return on assets and return on equity have a statistically significant and positive effect on their current value. Capital intensity negatively affects ROA at the 99% confidence interval. The leverage ratio has a significant negative effect on both ROA and ROE. It is found that changes in sales and LGDP have a positive and significant relationship on both ROA and ROE. The dummy variable established for the companies in the sustainable index has a positive effect on ROE and a negative effect on ROS and MV/BV. Including companies in the index increases the return on equity while reducing the ROS and the MV/BV ratio. The asset size of the companies included in the sustainable index has a positive and statistically significant effect on the MV/BV ratio.

Table 7. GMM results.

Country	Turkey				South Korea			
Model	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
FP Proxy	ROA	ROE	ROS	MV/BV	ROA	ROE	ROS	MV/BV
Lagged Dependent	−0.1655 (0.157)	−0.1367 * (0.000)	0.0174 (0.845)	0.3678 * (0.000)	0.2737 * (0.000)	0.0852 * (0.004)	−0.0374 * (0.000)	0.1718 (0.318)
CR	−0.0002 (0.917)	−0.0013 (0.870)	0.0041 (0.588)	−0.0853 (0.276)	0.0014 (0.693)	−0.0065 (0.553)	0.0756 * (0.000)	−0.0235 (0.581)
CI	−0.0125 *** (0.056)	−0.0073 (0.740)	−0.0041 ** (0.051)	−0.1010 ** (0.051)	−0.0024 * (0.003)	−0.0015 (0.108)	−0.0256 * (0.000)	0.0135 * (0.015)
LEV	−0.2061 * (0.001)	−0.1390 (0.558)	−0.4617 * (0.000)	4.5218 * (0.006)	−0.2672 * (0.000)	−0.7065 * (0.000)	−0.5126 * (0.007)	0.6435 (0.165)
SP	−0.2185 *** (0.073)	−0.6314 (0.338)	−0.2884 (0.416)	−1.7210 (0.698)	0.0329 (0.272)	0.2595 * (0.001)	−0.1176 *** (0.060)	−0.7112 *** (0.088)
CS	0.0455 * (0.000)	0.1275 * (0.000)	0.1351 * (0.000)	0.1797 (0.581)	0.0399 * (0.012)	0.0666 * (0.019)	0.1720 * (0.000)	0.2914 * (0.002)
SIZE	−0.0037 (0.490)	−0.0374 *** (0.069)	0.0234 ** (0.029)	0.4405 * (0.008)	0.0257 (0.415)	0.2215 * (0.000)	0.1249 (0.232)	−0.6767 * (0.001)
LGDP	0.0268 ** (0.047)	0.0064 (0.882)	−0.0161 (0.465)	−0.8897 * (0.011)	0.0111 * (0.002)	0.0190 * (0.041)	0.0319 * (0.000)	0.2773 * (0.000)
SP × SIZE	0.0101 *** (0.071)	0.0303 (0.313)	0.0122 (0.441)	0.0672 (0.732)	0.0176 (0.722)	−0.0512 (0.540)	−0.0862 (0.358)	0.6342 * (0.051)
WALD	63.95 * (0.0000)	71.58 * (0.0000)	224.99 * (0.0000)	913.71 * (0.0000)	360.71 * (0.0000)	223.41 * (0.0000)	5597.19 * (0.0000)	1497.92 * (0.0000)
AR1	−1.4004	−1.5732	−1.9795 **	−2.2529 **	−2.7661 *	−2.1183 **	−1.4649	−0.7636
AR2	−0.6978	−1.2406	−1.4215	−1.7325	−1.6885	0.4267	−1.2304	−0.0292
Sargan	16.6688	10.9469	13.7860	19.8013	9.4017	10.8221	12.7608	20.0926
df	18	18	18	18	17	17	17	17

Notes: \*, \*\* and \*\*\* denote 1%, 5% and 10% significance levels, respectively. AR1 and AR2 are the first- and second-order correlation test results of first-differentiated residues. It is not series-correlated, and  $N(0,1)$  is asymptotically distributed under the null hypothesis. Sargan is a test of extreme descriptive constraints asymptotically distributed as  $\chi^2$  under the null hypothesis, which means variables are valid with df degrees of freedom [85].

### 5.3. Discussion

Four proxies (ROA, ROE, ROS, and MV/BV) were used for financial performance, and the effect of sustainability performance on financial performance indicators in the two countries was examined. As a result of the analysis, it was determined that sustainability performance significantly affects ROA for Turkey. These findings are in line with the findings of similar studies. These studies found a positive relationship between sustainability performance and ROA [11,86–88]. The results of the present study for Turkey also differ from those of similar studies. For example, refs. [59,89,90] found that there was no significant relationship between sustainability performance and ROA. It was determined that the sustainability performances of companies operating in South Korea did not significantly affect ROA. These results differ from the results of similar studies. These studies found a negative relationship between sustainability performance and ROA [14,56,91]. When we analyzed the results regarding ROE, the second proxy used for FP, it was determined that Turkish firms' sustainability performance did not significantly affect ROE. Results of previous research support these findings [89,90,92]. It was found that sustainability performance had a significant and positive effect on ROE for South Korea. The findings of similar studies support these results, as [86,93] found a positive relationship between sustainability performance and ROE. However, the current research results for South Korea differ from those of other similar studies. Researchers determined a negative and significant relationship between SP and ROE [13,14,56].

The findings also showed that SP had no significant effect on ROS in Turkey. This result was the opposite for South Korea, where SP had a negative and significant effect on ROS. The significant effect of SP on ROS has been confirmed in some studies [94–97]. The final



proxy used for FP is the market value–book value ratio. For both countries, sustainability performance did not significantly affect the market value–book value ratio. These results differ from the results of similar studies. Researchers have found a positive and significant relationship between sustainability performance and market value [6,20,45,74]. As far as we know from the literature, there is no research in which the market value–book value ratio is used as the FP indicator; for this reason, studies examining the relationship between SP and market value are mentioned.

An essential result of the research is related to companies in developed and developing countries. The findings show no significant effect of SP on FP in three proxies (ROE, ROS, MV/BV) in an emerging country. However, SP significantly affects FP for two proxies (ROE and ROS) for South Korea. These results reveal that the relationship between SP and FP in companies in developed and developing countries differs in the current study. Furthermore, these results differ from the results of similar studies. For example, ref. [65] found a positive relationship between SP and FP in both developed and developing countries. In addition, they determined that there is a positive relationship between SP and investment efficiency, which is more vital in developed countries than in developing countries.

An essential contribution of the research is related to the results of the moderator effect of firm size. While the  $SP \times SIZE$  interaction had a significant and positive effect only on ROA for Turkey, it had a significant effect on ROE (negative) and ROS (positive) for South Korea. For Turkey, the ROA of large companies included in the sustainability index is increasing. For South Korea, as the ROS of the large companies included in the sustainability index decreased, the ROE increased. These results differ from the results of similar studies for both countries. For example, ref. [69] found that large companies with high sustainability performance have high growth rates and returns on equity. In addition, these findings are in line with the findings of similar studies. For example, ref. [98] found that firm size moderates the relationship between sustainability disclosures and financial performance. They argued that government measures regarding sustainability negatively affect financial performance for large firms, while the opposite is valid for small firms. The authors of [78] determined that firm size moderates the effect between sustainability practices and operational performance.

Finally, the GMM analysis results revealed whether the past year's financial performance indicators affect the financial performance in the current period. In Turkey, the previous year's ROE had a negative effect on the current ROE value; the previous year's ROS and MV/BV variables positively affected their current value. As well, the previous year's ROA had no significant effect on the current ROA value. For Turkey, the moderator variable  $SP \times SIZE$  only significantly and positively affected ROA. In South Korea, the previous year's ROA and ROE statistically and positively affected their current value. In addition, the moderator variable  $SP \times SIZE$  positively affected ROE and negatively affected ROS and MV/BV for South Korea. GMM analysis was performed in a few studies regarding the financial performance context, and different results were obtained. For example, ref. [99] performed GMM and argued that sustainability practices positively affect financial performance (ROAA, ROAE), and [100] also applied GMM and found that the previous year's ROA and Tobin Q positively affected their current value. They also argued that the previous year's ROE negatively impacted the current value of ROE.

#### 5.4. Theoretical and Managerial Implications

In the study, different results were obtained for Turkey and South Korea. For South Korea, SP impacts FP in terms of two proxies (ROE, ROS). These results support the arguments of the instrumental stakeholder theory. In light of the theory, it is possible to state that companies in South Korea that are included in the sustainability index have a positive impact on their stakeholders, and as a result, their financial performance has increased. It can be stated that the financial performance of companies that meet the needs of their stakeholders regarding environmental, social, and economic sustainability are positively affected, and they have an advantageous position compared to their competitors.

For Turkey, it was determined that there was only a relationship between SP and FP in terms of ROA, excluding the other three proxies. Therefore, these findings indicate that the arguments of instrumental stakeholder theory are not supported. Furthermore, it is understood that the sustainability efforts of Turkish companies are either unrequited for the stakeholders, or they do not have an impact on the stakeholders at a level that could increase or decrease financial performance.

In the light of agency and legitimacy theories, the sustainability performance of large-sized companies in Turkey increases ROA. As companies grow, their sustainability activities increase, resulting in an increase in financial performance in terms of the ROA proxy. However, a similarly significant effect is not valid for ROE, ROS, and MV/BV. Therefore, for ROA, these findings support the agency and legitimacy theories, while these are not supported for the other three proxies. In South Korea, the sustainability performance of large-sized companies increases ROS and decreases ROE. Hence, the findings related to ROS support both theories. For example, although a significant effect was found regarding ROE, this effect is negative and, therefore, not supported by either theory. Moreover, the effect of the moderator variable differs in terms of the financial performance indicators of both countries. It is understood that the SP–FP relationship does not increase in the same direction when the size of the firm increases, which supports opposing views regarding the two theories in terms of ROE, ROS, and MV/BV for Turkish firms and ROA, ROE, and MV/BV for South Korean firms.

When the results are analyzed from a managerial point of view, it is thought that there is a connection between the development levels of countries and the laws and regulations that companies have to implement. In this context, due to strict practices in developed countries, companies are likely to be more sensitive regarding sustainability activities and fulfilling mandatory requirements. This situation reveals that countries should compare their sustainability decisions and rules with those of developed countries. By doing so, countries can contribute to their companies' competitiveness beyond national borders. At the same time, companies can integrate the practices of other companies that they think are successful in sustainability into their processes. The awareness and consciousness of sustainability regarding environmental, social, and economic dimensions are increasing daily in society and among academics. This situation indicates that companies focusing on sustainability activities and making decisions considering the environment, society, and people can gain a competitive advantage. Managers need to focus mainly on waste recovery and energy efficiency. Companies must form teams that can develop innovative ideas such as soilless agriculture and producing energy from waste, and determine a significant research and development budget for this purpose. Many studies have shown a positive relationship between SP and FP that is more robust, especially for companies in developed countries. Therefore, we believe that, based on the findings of previous and current research, it is necessary to make managerial inferences with a focus on developed countries and to take the practices in these countries as an example.

## 6. Conclusions

The primary purpose of the research is to examine the effect of sustainability performance on financial performance with a focus on companies operating in South Korea and Turkey. In addition, it aims to examine this impact specific to developed and developing countries. Being listed in the BIST Sustainability Index and Dow Jones Sustainability Korea Index was designated as a proxy for SP, while ROA, ROE, ROS, and MV/BV were used as proxies for FP. The main result of the research reveals that the impact of sustainability performance on financial performance is different between South Korea and Turkey. This result shows that the SP–FP relationship differs between developed and developing countries. In addition, the  $SP \times SIZE$  moderator variable reveals different results regarding the financial performances of the companies of both countries. However, the results of the GMM analysis also show that the past year's data for the companies in both countries differ in their influence on the current data. For South Korea, the past values of ROA and

ROE statistically and positively affect their current value. For Turkey, past ROE, ROS, and MV/BV value positively affect their current value.

The study used ROA, ROE, ROS, and MV/BV as FP proxies. Researchers could use other variables, such as Tobin's Q and share price, as an FP proxy. They could also examine variables (such as firm value) that may mediate the impact of SP on FP. Since the sustainability index was published in Turkey in 2014, the SP and FP of the companies between 2015–2021 were considered. In the study, companies in Turkey and South Korea were examined. Researchers could examine more countries or groups (such as OECD and G7) when investigating the SP–FP relationship. Banks, insurance companies, and REITs were not examined in the study; it would be possible to also examine these institutions in future research. Finally, companies in the BIST 100 and KOSPI 100 indices were examined in the research. Researchers could also analyze different markets in the same countries (such as BIST 30).

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