



The effect of ESG activities on financial performance: The moderating effect of debt ratio

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ABSTRACT

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This study examined the effect of environmental, social, and governance (ESG) management on corporate performance. We collected sample data on KOSPI-listed companies in 2021 using ESG ratings released by the Korea Corporate Governance Service. The system of ratings was segmented into three distinct categories for the purpose of analysis, namely the environment, society, and governance. An empirical investigation was conducted to determine how ESG ratings and separate ratings (E, S, and G ratings) affect financial performance. We also examined the moderating impact of the debt ratio on the association between ESG ratings and financial performance to enhance the explanatory strength of this relationship. The results indicated that ESG ratings and E and S ratings are positively related to financial performance, and the debt ratio has a negative moderating effect on the link between ESG ratings related to environmental aspects and financial performance. The findings indicate that firms need ESG management to improve financial performance. ESG ratings can be utilized to show the effects of environment-focused management, sustainability, and CSR initiatives on financial performance. Additionally, the moderation effect of the debt ratio in this study clearly demonstrates the connection between ESG rating and financial performance. Our analysis also demonstrates that organizations with high debt ratios and a lack of resources to pursue ESG are unable to devote a significant amount of time and resources to ESG management.

Contribution/Originality: We examined how ESG ratings affect financial performance and identified the positive association between ESG, ESG-E, and ESG-S activities and financial performance. The findings of the study indicate that firms need ESG management and can provide a solution to the recent debate over how ESG activities can improve financial performance. This study shows that environmental and social ratings have a positive effect on financial performance.

1. INTRODUCTION

Environmental, social, and governance (ESG) management has emerged as a global mega trend in business and management. Shareholders and various stakeholders of business organizations, such as the government and local communities, are demanding that companies fulfill their social responsibility by complying with laws and regulations and by maintaining principles of environment, social, and governance (ESG) management. The intensity of these demands has grown. The Financial Services Commission of Korea announced a plan that the disclosure of ESG-related information will be mandatory after 2025 for corporations listed on the KOSPI (Korea Composite Stock Price

Index) market with assets of at least 2 trillion Korean Won (approximately USD 1.5 billion). By 2030, it will be mandatory for all KOSPI-listed companies.

Despite the importance of ESG, existing literature has reported mixed results on the relationship between ESG ratings and corporate performance. One of the most significant reasons for the inconsistent ratings, even within a company, is that researchers have used different measures and indicators. For example, [Giese, Nagy, and Lee \(2021\)](#) found that the governance structure (G) of a company has a positive impact on the stock price ([Giese et al., 2021](#)). [Leem \(2019\)](#) also found a positive relationship between corporate value and the ESG ratings of social (S) and governance (G) aspects. However, environment (E) ratings were not found to be positively related to corporate value in Leem's study ([Leem, 2019](#)). In another study on ESG, [Jeong \(2022\)](#) reported high correlations between corporate value and the social (S) rating measured by the Korea Economic Justice Index (KEJI) developed by the Institute for Economic Justice and the governance (G) rating measured by the Korea Corporate Governance Service ([Jeong, 2022](#)).

Given the growing importance and interest in ESG management among strategic management researchers, we conducted an empirical study on the financial impacts of ESG management. Specifically, we examined the impact of the use of an ESG evaluation index on effective and successful ESG management to enhance financial performance. This study used the ESG rating instrument developed by the Korea Institute of Corporate Governance and Sustainability (KICGS), which includes an environmental rating (4 indexes), a social rating (10 indexes), and a governance structure rating (8 indexes). The ratings of the three sub-categories were combined to compute the ESG rating as a whole.

We identified the impact of ESG activities on financial performance to be strengthened by applying more indicators of ESG management. Also, we identified the moderating effect of debt ratio on the relationship between ESG management and firm performance.

Lastly, we proposed a precise indicator of ESG activities for stakeholders to consider to raise corporate value. The evaluation was based on the results of empirical studies by comparing and analyzing the ESG evaluation index resulting from an external evaluation and the ESG management index performed by companies. This study has implications for internal and external stakeholders on the importance and validity of ESG management.

2. THEORY AND HYPOTHESES

2.1. Non-Market Strategy

Research has examined organizations' market and non-market strategies to gauge the effectiveness of ESG management ([Dorobantu, Kaul, & Zelner, 2017](#)). In addition to the traditional strategies based on market and competitor analysis, companies have also implemented other strategic options, including coalition strategies such as corporate social responsibility (CSR), proactive strategies such as political contributions, and influence strategies such as corporate-level lobbying.

[Dorobantu et al. \(2017\)](#) offered the most popular approach for classification, in which each company selects a strategic position of 1) adapting to the existing institutional structure, 2) adding to the existing institutional structure, or 3) transforming the institution itself depending upon its strategic intention ([Dorobantu et al., 2017](#)). Companies can make their strategic choices either independently or cooperatively with other players. Based on these three strategic intentions and two implementation modes, we identified six strategies: internalization strategy, partnership strategy, proactive strategy, collective strategy, influence strategy, and coalition strategy.

In the internalization strategy, a company adapts to the existing institutional structure and attempts to vertically integrate and internalize the activities of the company to prevent infringement of intellectual property in an industry where copyright protection is less secure ([Acemoglu, Johnson, & Mitton, 2009](#); [Antras & Helpman, 2004](#); [Fabrizio & Thomas, 2012](#); [Nunn, 2007](#)). The partnership strategy encourages companies to cooperate with other stakeholders to form a partnership or joint venture in a hybrid structure as an adaptation strategy to the existing institutional structure ([Brouthers, Brouthers, & Werner, 2003](#); [Delios & Henisz, 2000](#); [Henisz, 2000](#); [Meyer, Estrin, Bhaumik, &](#)

Peng, 2009). This strategy may be most effective when the market is vulnerable because of non-market forces such as political pressure. Companies using proactive strategy and collective strategy maintain existing strategic intentions with little or no addition of any new strategic elements to minimize extra costs. In particular, the proactive strategy utilizes externalities (Kaul & Luo, 2016; Vogel, 2010) such as corporate social responsibility (CSR) to promote positive externalities or reduce negative externalities in the existing institutional environment. The collective strategy is the creation of generally accepted corporate standards or patterns of behavior by collaborating with other firms in the industry (Ostrom, 1990).

The last two groups of strategies, influence strategy and coalition strategy, attempt to transform existing strategic intentions. The influence strategy transforms the existing strategic intention to create a favorable institutional environment for companies through political donations or corporate lobbying (Hillman & Hitt, 1999). Companies using the coalition strategy seek changes in the existing environment by collaborating with stakeholders in their industry. Sometimes companies using the coalition strategy also try to achieve their goals by lobbying (Felin, Kauffman, & Zenger, 2021; Jia, 2014).

CSR is classified as a proactive strategy. However, if a CSR activity is implemented due to external pressure that requires the company to proactively participate in CSR and to reveal the details of the CSR activities, it is highly likely that such a strategy evolves into a collective strategy. Therefore, this study aimed to identify how the performance of ESG management, which can be classified as a collective strategy, affects actual corporate performance.

2.2. Evaluation Indicators for ESG Activities

While a company's financial performance can be easily understood in quantitative terms through financial statements available to investors, non-financial performance is difficult to measure in quantitative terms due to its wide range and qualitative nature. However, as interest in activities for sustainability such as shared growth and social responsibility has increased, many organizations have developed various indicators to measure the non-financial performance of companies. For example, organizations have used shared growth indexes, sustainability report guidelines, and social responsibility indexes to help stakeholders understand non-financial performance. In particular, the UN Principles for Socially Responsible Investment have defined environment (E), society (S), and governance (G) as key factors of non-financial performance. ESG assessment models representing each key factor are widely used as indicators to comprehensively understand non-financial performance.

One of the leading ESG rating organizations in South Korea is the KICGS, established in 2002. KICGS is a non-profit organization that performs ESG assessments, financial corporate governance assessments, responsible investment support services, responsible voting assistance, and policy research. KICGS's ESG assessment model follows international standards such as the OECD Corporate Governance Principles and ISO 26000, but it is a Korean assessment model that reflects the legal and business environment of Korea. The organization has conducted yearly integrative as well as partial assessments of the ESG performance of KOSPI and KOSDAQ-listed domestic companies since 2011. KICGS's ESG evaluation model includes 237 core evaluation items in 13 major categories to assess whether a company has a well-developed system to minimize ESG-related risks and 38 core evaluation items to determine whether companies have engaged in ESG-related activities with a high risk of damaging corporate value. These evaluation items are based on three items: (1) the Model Code for Environmental Management (Min & Kim, 2019), which was established by the KICGS to provide a direction for desirable environmental management; (2) the Model Code for Social Responsibility Management (Korea Institute of Corporate Governance and Sustainability), which was developed to provide a direction for a company to be trusted internally and externally; and (3) the Model Code for Corporate Governance (Escrig-Olmedo, Fernández-Izquierdo, Ferrero-Ferrero, Rivera-Lirio, & Muñoz-Torres, 2019) for maximizing corporate value by enhancing transparency and efficiency. The main contents of the best practices for ESG management are shown in Table 1, 2, and 3.

The ESG evaluation results of the KICGS are categorized into seven grades (S, A+, A, B+, B, C, and D), and the evaluation results are disclosed on the website to inform stakeholders as they make investment decisions.

Table 1. Indicators for the evaluation of corporate environmental management (E) developed by KICGS.

Major category	Sub-category	Indicator for evaluation
Plan of environmental management	Will be implemented by top management	Presentation of the CEO's commitment to environmental management Disclosure of environmental information
	Strategies and policies for environmental management	Integration into corporate strategies
	Developing goals and plans for environmental management	Consistency with the presented policies and directions for environmental management
	Eco-friendly culture of the organization	Raising awareness of environmental management Providing training to strengthen capabilities.
	Eco-friendly structure of the organization	Establishing roles and responsibilities and granting authorization related to environmental management
Implementation of environmental management	Eco-friendly production	Preventive environmental management across products and services
	Reaction to climate change	Establishing a management system to minimize greenhouse gas emissions
	Eco-friendly supply chain management	Building a green supply chain for purchasing green products
	Management of environmental risks	Developing a proactive response system Conducting regular inspections and drills
Management and report of environmental performance	Management of environmental performance	Developing an evaluation system for systematic analysis
	Environmental accounting	Developing an environmental accounting system Utilizing environmental accounting information
	Environmental audit	Developing and operating a proper environmental audit system on a regular basis
	Report of environmental information	Publicize major events and items related to environmental activities
Response to stakeholders	Engagement of stakeholders	Considering stakeholders' interests
	Activities related to environmental protection	Voluntary participation in domestic and international environmental programs

Table 2. Indicators for the evaluation of social activities (S) developed by KICGS.

Major category	Sub-category	Indicators for evaluation
Employees	Employment and working conditions	Developing a policy for employment security Benefits for employees
	Labor relations	Establishing and operating a Workers' Council Turnover rate
	Security and health in the workplace	Developing a policy for employee security and health
	Human resource development and support	Policies for employee training Outplacement program
	Human rights in the workplace	Policies for preventing forced labor, child labor, and discrimination
Partners & competitors	Fair trade	Developing a policy for fair trade with contractors
	Prevention of corruption	Establishing an internal organization to protect corruption Providing ethics training
	Promoting social responsibility	Evaluating a level of compliance and ethical management with selected partners
Consumers	Fair bargaining with consumers	Developing principles for the fair treatment of consumers
	Consumer security and health	Obtaining a domestic and/or international certificate for consumers

Major category	Sub-category	Indicators for evaluation
Community	Protection of consumers' private information	Developing a policy for managing and protecting consumer privacy
	Communication with consumers	Developing a policy to boost consumer satisfaction
	Engagement with the local community	Developing a policy to support the prosperity of the local community
Community	Contribution to the local economy	Giving priority to local suppliers
	Communication with the local community	Adopting a communication channel with local residents

Table 3. Indicators for the evaluation of corporate governance (G) developed by KICGS.

Major category	Sub-category	Indicators for evaluation
Shareholders	Shareholders' rights	Rights as corporate owners Protecting the maximum rights of shareholders
	Equal treatment for shareholders	Protecting shareholders from infringements of core rights Providing clear information
	Shareholders' responsibility	Guaranteeing voting rights for corporate development
Board of directors	Functions of the board of directors	Implementing functions of corporate decision making and monitoring management
	Formation of board and selection of directors	Proper size for effective and considerate discussion and decision making
	External board members	There is no interest in the company making independent decisions
	Operation of the board of directors	Holding meetings on a regular basis, at least once per quarter
	Internal committees	Establishing committees for particular tasks
	Directors' obligations	Fulfilling duties of care as good managers
	Directors' responsibilities	Taking responsibility for damage due to a violation of laws, articles of incorporation, and obligations
	Evaluation and compensation for directors	A fair evaluation of performance and reflecting the results of the evaluation for compensation and reappointment decisions
Auditor	Internal audit	Audit committee as an internal committee of the board
	External auditor	Maintaining legal and real independence from the company conducting the audit
Stakeholders	Protection of stakeholders' rights	Efforts to prevent infringement of various stakeholders' rights
	Stakeholders' participation in management	Decision making through consensus among stakeholders
Management monitoring by market	Publicizing	Publicizing events and affairs that might affect important decisions
	Market for corporate management rights	Maintaining transparency and fairness in behaviors that might change management rights
	Institutional investors	Publicizing internal regulations regarding performing shareholder's rights

2.3. ESG Activities and Firm Performance

The literature has yielded mixed results on the relationship between firm performance and non-financial activities, including traditional ESG management. For example, non-financial activities can be a strategy companies use to differentiate themselves from other companies even in the same industry (Clarkson, Li, Richardson, & Vasvari, 2011; McWilliams & Siegel, 2011; Russo & Fouts, 1997; Waddock & Graves, 1997). In the long run, building good relationships with market stakeholders, such as investors, improves a firm's reputation and image (Ruf, Muralidhar, Brown, Janney, & Paul, 2001; Schnietz & Epstein, 2005; Servaes & Tamayo, 2013), which attracts high-quality talents (Servaes & Tamayo, 2013) and has a clear relationship with firm performance (Cochran & Wood, 1984). Furthermore, in firms that perform well in non-financial activities, employees have more positive job attitudes, lower absenteeism,

and ultimately higher labor productivity than firms that do not, which may also have a positive effect on firm performance (Servaes & Tamayo, 2013). However, some research has suggested that financial resources, which are supposed to be spent to maximize shareholder profits, are actually used by managers as agents of shareholders for social reasons without considering profitability, which may be contrary to shareholders' interests. Research has also found that decisions made by firms for environmental or social reasons rather than financial needs have a negative impact on firm financial performance by creating opportunity costs (Cochran & Wood, 1984; Friedman, 1970; Jensen, 2002; Weidenbaum & Vogt, 1987). Some studies have shown that non-financial activities are negatively related to financial performance. However, it is difficult to generalize that non-financial activities have a direct impact on financial performance because they are not variables that directly affect the competitive advantage of the company (Alexander & Buchholz, 1978; DiMaggio & Powell, 1983). In particular, given that non-financial activities such as ESG management are activities to secure social legitimacy, it is difficult to argue that these activities directly affect the financial performance of the company.

ESG-related research has focused on evaluation indicators of ESG, ESG activities and financial performance, and the effects of ESG on corporate value. Fish, Kim, and Venkatraman (2019) showed that more than 600 ESG ratings were reported in 2019 (Fish et al., 2019). However, there is a need for a universal standard for ESG ratings because each rating system adopts different standards and measurement methods depending on the institution (Berg, Koelbel, & Rigobon, 2022; Chatterji, Durand, Levine, & Touboul, 2016; Li & Polychronopoulos, 2020; Semenova & Hassel, 2015; Shanaev & Ghimire, 2022).

Most of the studies examining the relationship between corporate performance and corporate value have analyzed ESG ratings provided by the KICGS. For instance, Lee and Kim (2013) conducted an empirical analysis of the relationship between the ESG ratings created by KICGS and corporate value (Lee & Kim, 2013). In particular, they examined the impact of the respective ratings of the ESG sub-categories (environment, social, and governance) on corporate value and found that each sub-category as well as the ESG rating had a significant positive association with corporate value measures. Another study reported that an enterprise's ESG rating for a certain year had a significant positive relationship with the enterprise's value in the subsequent year, indicating that the effect of the ESG rating would continue into the next year (Lee & Kim, 2013).

A study by Lim (2018) on the effect of each sub-category of corporate ESG on corporate value found no significant relationship between corporate governance and value. However, they found a significant relationship between the other two elements (environment and social) and corporate value (Lim, 2018). Kim and Lee (2021) also examined how the ESG ratings of Korean public businesses affected their credit ratings and corporate value (Kim & Lee, 2021). They found that businesses with higher ESG ratings had lower debt financing costs, but their business worth did not increase as a result. Baik and Choi (2021) also conducted an empirical examination of the factors influencing business value and ESG ratings (Baik & Choi, 2021). Their study examined the association between ESG ratings and firm characteristics to identify financial factors affecting the ESG grade. Kang and Jung (2020) also examined changes in ESG activities based on the financial features of organizations. They found that the added value from ESG activities was higher in companies with higher profits, and more shares were owned by foreign investors (Kang & Jung, 2020). This finding illustrates how a company's financial attributes may influence how its ESG initiatives are perceived.

Taken together, companies that perform well in ESG activities have an improved external reputation and image, which positively affects firm performance (Ruf et al., 2001; Schnietz & Epstein, 2005; Servaes & Tamayo, 2013). Rather than focusing on market factors (e.g., market structure, competitive environment, positioning) as emphasized in traditional management strategies, companies can now enhance their competitiveness through non-market strategies by focusing on factors such as government policies, social responsibility, and business ethics (Baron, 1995; Dorobantu et al., 2017). Companies can avoid being the target of stakeholders through these non-market strategies, boost employee morale and productivity, and gain reputation benefits by improving their image (Baron, 1995; Dorobantu et al., 2017). The company's performance will reflect the economic impact that ESG activities have.

Therefore, this study establishes the following hypothesis and sub-hypotheses to analyze the relationship between the ESG rating and financial performance:

H: There is a positive association between ESG activities and financial performance.

H_{1a}: There is a positive association between the ESG rating and financial performance.

H_{1b}: There is a positive association between the environmental rating and financial performance.

H_{1c}: There is a positive association between the social rating and financial performance.

H_{1d}: There is a positive association between the governance rating and financial performance.

2.4. The Moderating Effect of Debt Ratio

This study also looked into how the debt ratio affected the above relationship in order to make the link between ESG ratings and financial performance more useful for explaining things. Because of the instability of a company's financial structure and ensuing solvency issues, a high debt ratio can have an impact on the relationship between ESG ratings and financial success (Buchholtz, Amason, & Rutherford, 1999; McWilliams & Siegel, 2000; Preston & O'bannon, 1997). According to some earlier research based on slack resource theory (Daniel, Lohrke, Fornaciari, & Turner Jr, 2004), businesses eventually pursue more social value when they have extra (slack) resources, particularly in terms of money. However, a high debt ratio may result in fewer available resources (Wally & Fong, 2000). According to slack resource theory, an increase in the debt ratio indicates a lack of financial resources to implement ESG initiatives, which could reduce the impact of ESG management on financial performance. Thus, the following hypothesis is established:

Hypothesis 2: There is a negative moderating effect of debt ratio between ESG activities and financial performance.

Hypothesis 2a: There is a negative moderating effect of debt ratio on the ESG rating and financial performance.

Hypothesis 2b: There is a negative moderating effect of debt ratio between E rating and financial performance.

Hypothesis 2c: There is a negative moderating effect of debt ratio between S rating and financial performance.

Hypothesis 2d: There is a negative moderating effect of debt ratio on the G rating and financial performance.

3. MATERIALS AND METHODS

3.1. Data Collection and Sample Description

In this study, we analyzed data collected from public companies listed on KOSPI in 2021. We collected data on ESG ratings and other relevant financial data from the Korea Institute of Corporate Governance and Sustainability, Fn Guide, and the Data Analysis, Retrieval, and Transfer (DART) system for financial supervisory service. After screening, data from 709 firms was analyzed in this study.

3.2. Research Design

3.2.1. Regression Model for ESG and Firm Performance

This study aims to investigate the relationship between ESG activities and firm performance in Korea. To verify hypothesis 1, we built the following regression Models 1-5:

$$ROA_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 E_{i,t} + \beta_3 S_{i,t} + \beta_4 G_{i,t} + \beta_5 CURRENT_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 RND_{i,t} + ID + \varepsilon \quad (1)$$

$$ROA_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 CURRENT_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 RND_{i,t} + ID + \varepsilon \quad (2)$$

$$ROA_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 CURRENT_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 RND_{i,t} + ID + \varepsilon \quad (3)$$

$$ROA_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_2 CURRENT_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 RND_{i,t} + ID + \varepsilon \quad (4)$$

$$ROA_{i,t} = \beta_0 + \beta_1 G_{i,t} + \beta_2 CURRENT_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 RND_{i,t} + ID + \varepsilon \quad (5)$$

The dependent variable for Models 1-5 is the total return on assets (ROA). This study used return on assets (ROA), which is the most commonly used indicator of corporate performance, as a dependent variable. The independent variables included four ESG ratings: environment, social, governance, and aggregated ratings. We used

the ESG rating scale developed by KICGS. The scale has seven grades (S, A+, A, B+, B, C, and D), which are coded as 1 (D) through 7 (S). Based on existing literature, some variables were controlled (Barker & Mueller, 2002; Hill & Snell, 1989). Consistent with the extant literature, the following set of variables is included as control variables: current ratio (CURRENT), firm size (SIZE), R&D intensity (RND), and industry dummies. Since a company with a high current ratio has sufficient capacity to invest in long-term projects, we included the current ratio measured by current assets/current liabilities. Firm size is measured by the market capitalization of the firms. The R&D intensity of the sampled firms was derived as the ratio of R&D expenditure to sales. The model also controls the dummies by industrial sector (ID).

3.2.2. Regression Model for Debt Ratio

Further, we explored the moderating effect of the debt ratio on the relationship between ESG activities and firm performance. To test our assumption, we used the following regression Models 6-9:

$$ROA_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_3 DBET + \beta_4 ESG * DEBT + \beta_5 CURRENT_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 RND_{i,t} + ID + \varepsilon \quad (6)$$

$$ROA_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_3 DBET + \beta_4 E * DEBT + \beta_5 CURRENT_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 RND_{i,t} + ID + \varepsilon \quad (7)$$

$$ROA_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_3 DBET + \beta_4 S * DEBT + \beta_5 CURRENT_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 RND_{i,t} + ID + \varepsilon \quad (8)$$

$$ROA_{i,t} = \beta_0 + \beta_1 G_{i,t} + \beta_3 DBET + \beta_4 G * DEBT + \beta_5 CURRENT_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 RND_{i,t} + ID + \varepsilon \quad (9)$$

In the above model, DEBT indicates the debt ratio. In testing how debt ratio is related to the effect of ESG on firm performance, the key variable of interest is the interaction terms between ESG and DEBT.

4. RESULTS

Table 4 demonstrates the descriptive statistics and correlations between the variables used in this study. The average ESG rating, which is the main variable of interest, was 3.230, which indicates that most of the companies analyzed in this study were graded between B+ and B. Pearson correlation coefficients of ROA with the ESG ratings, E, and S ratings were significantly positive at the 1% level. This result indicates that ROA increases as the ratings rise.

Table 4. Descriptive statistics and correlation analysis.

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. ROA	3.735	7.347	1.000								
2. Current ratio	207.669	239.098	0.051*	1.000							
3. Firm size	2152046.030	14503346.459	0.094***	-0.010	1.000						
4. R&D intensity	0.0110	0.0263	-0.072**	0.110***	0.123***	1.000					
5. ESG grades	3.230	1.256	0.158***	-0.157***	0.129***	0.029	1.000				
6. E (Economic)	2.680	1.436	0.186***	-0.156***	0.167***	-0.021*	0.853	1.000			
7. S (Social)	3.390	1.592	0.152***	-0.160***	0.157***	0.059**	0.895*	0.765***	1.000		
8. G (Governance)	3.690	1.074	0.026	-0.088***	0.035	-0.018	0.206	0.201***	0.193***	1.000	
9. Debt ratio	137.386	202.360	-0.278***	-0.251***	-0.032	-0.074**	0.041**	0.007	0.047	0.054*	1.000

Note: This table presents descriptive statistics of key variables for the sample and Pearson correlations between key variables for the sample. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

To examine the effects of ESG activities on financial performance, we conducted a hierarchical regression analysis by controlling the current ratio, firm size, and R&D intensity. Table 5 shows the results of the hierarchical regression on the effects of both ESG ratings and each rating, such as the E, S, and G ratings, on financial performance. Specifically, Model 1 in Table 5 included control variables only, while Model 2 analyzed the effect of ESG ratings and E, S, and G ratings on financial performance. The coefficient of these ratings in ROA is significantly positive at the 1% level, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1 = 4.732 ($p < 0.05$) and Model 2 = 5.906 ($p < 0.001$)). The coefficients of determination (R^2) were 0.02 (Model 1) and 0.056 (Model 2). Multicollinearity was not an issue, as the tolerance values of all the variables were higher than 0.1 and the VIF (variance inflation factor) values were lower than 10. The results indicated that the E rating was significantly associated with financial performance ($b = 0.163$, $p < 0.05$), while the effects of the other ratings were not significant. These findings partially support Hypothesis 1, indicating that the environment rating is positively related to financial performance. With regard to the control variables, the predicted signs are generally consistent with the findings in the previous studies. The results show that ROA increases as the current ratio, firm size, and R&D intensity increase.

Table 5. Results of regression analysis of the effects of ESG on financial performance.

Variables	Model 1				Model 2			
	B	SE	β	t(p)	B	SE	β	t(p)
Constant	3.463	0.376		9.215***	0.569	1.178		0.483
Current ratio	0.002	0.001	0.064	1.713*	0.003	0.001	0.095	2.537**
Firm size	5.371E-08	0.000	0.106	2.811**	3.643E-08	0.000	0.072	1.900*
R&D intensity	-25.389	10.589	-0.091	-2.398**	-25.103	10.506	-0.090	-2.389**
ESG					-0.116	0.598	-0.020	-0.194
E (Economic)					0.837	0.366	0.163	2.285**
S (Social)					0.282	0.383	0.061	0.735
G (Governance)					-0.024	0.258	-0.004	-0.094
$F(p)$	4.732**				5.906***			
R^2	0.020				0.056			
Adj. R^2	0.016				0.046			

Note: This table provides the result of the effect of ESG activities and each activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 6 shows the results of the hierarchical regression on the effects of ESG ratings on financial performance. Specifically, Model 1 in Table 6 included control variables only as independent variables without ESG ratings, while Model 2 analyzed the effect of ESG ratings on financial performance. The coefficient of ESG rating in ROA is significantly positive at the 1% level, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1 = 4.725 ($p < 0.05$) and Model 2 = 8.938 ($p < 0.001$)). The coefficients of determination (R^2) were 0.02 (Model 1) and 0.048 (Model 2). Multicollinearity was not an issue, as the tolerance values of all the variables were higher than 0.1 and the VIF (variance inflation factor) values were lower than 10. The results indicated that the ESG ratings were significantly associated with financial performance ($b = 0.173$, $p < 0.001$), while the effects of the other ratings were not significant. These findings support Hypothesis 1a.

Table 6. Results of regression analysis of the effects of ESG on financial performance.

Variables	Model 1				Model 2			
	B	SE	β	t(p)	B	SE	β	t(p)
Constant	3.455	0.375		9.204***	0.080	0.822		0.098
Current ratio	0.002	0.001	0.064	1.713*	0.003	0.001	0.091	2.436**
Firm size	5.374E-08	0.000	0.106	2.813**	4.291E-08	0.000	0.084	2.261**
R&D intensity	-25.287	10.583	-0.090	-2.389**	-26.879	10.441	-0.096	-2.574***
ESG					1.007	0.219	0.173	4.601***
$F(p)$	4.725**				8.938***			
R ²	0.020				0.048			
Adj. R ²	0.015				0.043			

Note: This table provides the result of the effect of ESG activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 7 shows the results of the hierarchical regression on the effects of E ratings on financial performance. Model 1 in Table 7 included control variables only as independent variables without E ratings, while Model 2 analyzed the effect of E ratings on financial performance. The coefficient of E rating in ROA is significantly positive at the 1% level, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1 = 4.725 ($p < 0.05$) and Model 2 = 10.239 ($p < 0.001$)). The coefficients of determination (R^2) were 0.02 (Model 1) and 0.055 (Model 2). Multicollinearity was not an issue, as the tolerance values of all the variables were higher than 0.1 and the VIF (variance inflation factor) values were lower than 10. The results indicated that the E rating was significantly associated with financial performance ($b = 0.193$, $p < 0.001$). These findings support Hypothesis 1b, indicating that the environment rating is positively related to financial performance.

Table 7. Results of regression analysis of the effects of E on financial performance.

Variables	Model 1				Model 2			
	B	SE	β	t(p)	B	SE	β	t(p)
Constant	3.455	0.375		9.204***	0.656	0.659		0.995
Current ratio	0.002	0.001	0.064	1.713*	0.003	0.001	0.093	2.494**
Firm size	5.374E-08	0.000	0.106	2.813**	3.721E-08	0.000	0.073	1.954*
R&D intensity	-25.287	10.583	-0.090	-2.389**	-23.981	10.402	-0.086	-2.305**
E (Economic)					0.986	0.192	0.193	5.126***
$F(p)$	4.725**				10.239***			
R ²	0.020				0.055			
Adj. R ²	0.015				0.049			

Note: This table provides the result of the effect of E activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 8 shows the results of the hierarchical regression on the effects of S ratings on financial performance. Model 1 in Table 8 included control variables only as independent variables without E ratings, while Model 2 analyzed the effect of S ratings on financial performance. The coefficient of S rating in ROA is significantly positive at the 1% level, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1 = 4.725 ($p < 0.05$) and Model 2 = 8.514 ($p < 0.001$)). The coefficients of determination (R^2) were 0.02 (Model 1) and 0.046 (Model 2). Multicollinearity was not an issue, as the tolerance values of all the variables were higher than 0.1 and the VIF (variance inflation factor) values were lower than 10. The results indicated that the S rating was significantly associated with financial performance ($b = 0.167$, $p < 0.001$). These findings support Hypothesis 1c, indicating that social rating is positively related to financial performance.

Table 8. Results of regression analysis of the effects of S on financial performance.

Variables	Model 1				Model 2			
	B	SE	β	t(p)	B	SE	β	t(p)
Constant	3.455	0.375		9.204***	0.732	0.719		1.017
Current ratio	0.002	0.001	0.064	1.713*	0.003	0.001	0.091	2.435**
Firm size	5.374E-08	0.000	0.106	2.813**	4.121E-08	0.000	0.081	2.161**
R&D intensity	-25.287	10.583	-0.090	-2.389**	-28.094	10.467	-0.100	-2.684***
S (Social)					0.770	0.174	0.167	4.417***
$F(p)$	4.725**				8.514***			
R ²	0.020				0.046			
Adj. R ²	0.015				0.041			

Note: This table provides the result of the effect of S activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 9 shows the results of the hierarchical regression on the effects of G ratings on financial performance. Model 1 in Table 9 included control variables, while Model 2 analyzed the effect of G ratings on financial performance. The findings do not support Hypothesis 1d.

Table 9. Results of regression analysis of the effects of G on financial performance.

Variables	Model 1				Model 2			
	B	SE	β	t(p)	B	SE	β	t(p)
Constant	3.463	0.376		9.215***	2.575	1.035		2.487**
Current ratio	0.002	0.001	0.064	1.713*	0.002	0.001	0.067	1.784*
Firm size	5.371E-08	0.000	0.106	2.811***	5.308E-08	0.000	0.104	2.775***
R&D intensity	-25.389	10.589	-0.091	-2.398**	-25.270	10.591	-0.090	-2.386**
G (Governance)					0.236	0.256	0.034	0.920
$F(p)$	4.732**				3.760**			
R ²	0.020				0.021			
Adj. R ²	0.016				0.015			

Note: This table provides the result of the effect of G activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Based on the results supported by Hypothesis 1, Table 10 provides the results of Hypothesis 2a. It shows the results of the hierarchical regression on the effects of moderating effect of debt ratio on the relationship between ESG ratings and financial performance. The coefficient of the interaction term, ESG ratings, and debt ratio throughout Model 1–3 continues to be negative and highly significant at the 1% level. Model 1 of in Table 10 included control variables and ESG ratings, and we conducted a moderation analysis with Model 2, which added debt ratio as a moderating variable into the regression model, and Model 3, which analyzed the moderation effect of the debt ratio. All the models were statistically significant, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1=8.415 (p<0.001), Model 2=19.566 (p<0.001), and Model 3=16.542 (p<0.001). Coefficients of determination (R²) were 0.046 (Model 1), 0.122 (Model 2), and 0.124 (Model 3). The findings do not support Hypothesis 2a.

Table 10. Results of regression analysis of the moderating effect of debt ratio on the relationship between ESG and firm performance.

Variables	Model 1				Model 2				Model 3			
	B	SE	β	t(p)	B	SE	β	t(p)	B	SE	β	t(p)
Constant	0.266	0.825		0.322	2.148	0.827		2.596**	1.466	1.012		1.449
Current ratio	0.003	0.001	0.088	2.353**	0.001	0.001	0.018	0.486	0.001	0.001	0.020	0.539
Firm size	4.324E-08	0.000	0.085	2.283**	3.896E-08	0.000	0.077	2.142**	3.773E-08	0.000	0.074	2.072**
R&D intensity	-26.917	10.418	-0.096	-2.584**	-30.357	10.009	-0.109	-3.033***	-29.917	10.014	-0.107	-2.988**
ESG	0.962	0.219	0.165	4.383***	0.974	0.211	0.167	4.626***	1.203	0.287	0.206	4.189***
Debt ratio					-0.010	0.001	-0.286	-7.829***	-0.005	0.004	-0.148	-1.194
ESG*Debt ratio									-0.002	0.001	-0.151	-1.172
$F(p)$	8.415***				19.566***				16.542***			
R ²	0.046				0.122				0.124			
Adj. R ²	0.040				0.116				0.116			

Note: This table provides the result of the moderating effect of debt ratio on the relationship between ESG activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 11. Results of regression analysis of the moderating effect of debt ratio on the relationship between E and firm performance.

Variables	Model 1				Model 2				Model 3			
	B	SE	β	t(p)	B	SE	β	t(p)	B	SE	β	t(p)
Constant	0.778	0.660		1.179	2.776	0.686		4.046***	2.095	0.732		2.861**
Current ratio	0.003	0.001	0.090	2.419**	0.001	0.001	0.020	0.543	0.000	0.001	0.014	0.390
Firm size	3.756E-08	0.000	0.074	1.977**	3.420E-08	0.000	0.067	1.872*	3.022E-08	0.000	0.060	1.655*
R&D intensity	-24.134	10.377	-0.086	-2.326**	-27.533	9.987	-0.099	-2.757***	-26.783	9.951	-0.096	-2.692***
E (Economic)	0.956	0.193	0.187	4.965***	0.915	0.185	0.179	4.941***	1.308	0.239	0.256	5.470***
Debt ratio					-0.010	0.001	-0.280	-7.664***	-0.005	0.002	-0.138	-2.110**
E*Debt									-0.003	0.001	-0.186	-2.583***
$F(p)$	9.802***				20.232***				18.108***			
R ²	0.053				0.126				0.134			
Adj. R ²	0.047				0.119				0.126			

Note: This table provides the result of the moderating effect of debt ratio on the relationship between E activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 12. Results of regression analysis of the moderating effect of debt ratio on the relationship between S and firm performance.

Variables	Model 1				Model 2				Model 3			
	B	SE	β	t(p)	B	SE	β	t(p)	B	SE	β	t(p)
Constant	0.879	0.721		1.219	2.741	0.731		3.748***	2.469	0.875		2.821***
Current ratio	0.003	0.001	0.088	2.354**	0.001	0.001	0.018	0.493	0.001	0.001	0.020	0.537
Firm size	4.156E-08	0.000	0.082	2.185**	3.707E-08	0.000	0.073	2.030**	3.638E-08	0.000	0.072	1.987***
R&D intensity	-28.093	10.441	-0.101	-2.691***	-31.600	10.029	-0.113	-3.151***	-31.563	10.034	-0.113	-3.146
S (Social)	0.739	0.175	0.160	4.232***	0.759	0.168	0.164	4.529***	0.842	0.223	0.183	3.779***
Debt ratio					-0.010	0.001	-0.287	-7.857***	-0.009	0.004	-0.235	-2.350**
S*Debt ratio									-0.001	0.001	-0.059	-0.567
$F(p)$	8.083***				19.370***				16.179***			
R^2	0.044				0.121				0.121			
Adj. R^2	0.038				0.115				0.114			

Note: This table provides the result of the moderating effect of debt ratio on the relationship between S activities on financial performance. The sample contains 709 firms. ***, **, * indicate significance at the 0.01, 0.05, and 0.10 levels (two-tailed), respectively.

Table 11 provides the results of Hypothesis 2b. It shows the results of the hierarchical regression on the effects of moderating effect of debt ratio on the relationship between E ratings and financial performance. The coefficient of the interaction term, E ratings, and debt ratio throughout Model 1–3 continues to be negative and highly significant at the 1% level. Model 1 of in Table 11 included control variables and E ratings, and we conducted a moderation analysis with Model 2, which added debt ratio, and Model 3, which analyzed the moderation effect of the debt ratio. All the models were statistically significant, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1 = 9.802 ($p < 0.001$), Model 2 = 20.232 ($p < 0.001$), and Model 3 = 18.108 ($p < 0.001$). The coefficients of determination (R^2) were 0.053 (Model 1), 0.126 (Model 2), and 0.134 (Model 3). Also, multicollinearity was not an issue, as the tolerance values of all the variables were higher than 0.1 and the VIF (variance inflation factor) values were lower than 10. The debt ratio significantly moderated the relationship between the E rating and financial performance, which supports hypothesis 2b ($b = -0.186$, $p < 0.01$). These results illustrate that there is a negative moderating effect of the debt ratio between the E rating and financial performance. To sum up, our evidence supports that the E rating has a positive effect on firm performance, and the debt ratio moderates the relationship between the E rating and firm performance.

Table 12 provides the results of Hypothesis 2c. It shows the results of the hierarchical regression on the effects of the moderating effect of debt ratio on the relationship between S ratings and financial performance. The coefficient of the interaction term, S ratings, and debt ratio throughout Model 1–3 continues to be negative and highly significant at the 1% level. Model 1 of in Table 12 included control variables and S ratings, and we conducted a moderation analysis with Model 2 and Model 3, which analyzed the moderation effect of the debt ratio. All the models were statistically significant, indicating that the independent variables of the models appropriately explain the variation in financial performance (F values of Model 1 = 8.083 ($p < 0.001$), Model 2 = 19.370 ($p < 0.001$), and Model 3 = 16.179 ($p < 0.001$). Coefficients of determination (R^2) were 0.044 (Model 1), 0.121 (Model 2), and 0.121 (Model 3). The findings do not support Hypothesis 2c.

5. DISCUSSION AND CONCLUSIONS

ESG management initiatives, which are evaluated as the leading qualitative changes in the global business environment, have been practiced in various fields. A lot of stakeholders, such as financial institutions and capital markets investors, have considered environmental and social performance when making investment decisions. Thus, many companies have integrated ESG management into their business operations. It is also important to highlight the discussion of stakeholder capitalism, which has stressed the significance of ESG. At its annual conference in August 2019, the Business Roundtable (BTR), which was attended by 181 CEOs of significant American businesses, adopted a declaration stating that organizations should eventually prioritize the needs of all stakeholders over increasing shareholder returns. Our empirical study examined how ESG management affects financial performance in light of the evolving business environment. We used the ESG rating, the ESG-E rating (4 indices), the ESG-S rating (10 indices), the ESG-G rating (8 indices), and the ESG rating to look at the relationship between ESG activities (environment, social, and governance) and financial performance. We also explored how the debt ratio moderated the relationship between the ESG rating and financial performance.

The following are the contributions this study makes: We conducted an empirical investigation to assess the impact of ESG ratings on financial performance in order to evaluate ESG management. The results showed a favorable correlation between financial performance and ESG, ESG-E, and ESG-S activities. The results show that companies require ESG management and can address the current controversy about how ESG initiatives can boost bottom line results. In addition to the current perspectives addressing the implications of environment-focused management, sustainability, and CSR initiatives on financial performance, ESG ratings can be utilized to strengthen the explanatory strength of this link. The primary goal is grounded in prior research, which indicates that financial

performance is positively impacted by both the ESG rating and the comprehensive environmental and social rating (Orlitzky, Schmidt, & Rynes, 2003).

Furthermore, this study's moderating effect of the debt ratio amply illustrates the relationship between financial performance and ESG rating. Given that ESG is typically implemented in response to requests from a variety of stakeholders, some have expressed concern that this approach may conflict with a company's fundamental goal of maximizing profits. According to our data, companies with high debt ratios that lack the resources to pursue ESG find it impossible to commit a substantial amount of time and money to ESG management.

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