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Article

The moderating effect of ESG pressures on the relationship between the environmental management capabilities and the non-financial performance of Korean SMEs

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Abstract: Based on the resource-based view and institutional theory, this study investigates the impact of their environmental management capabilities and environmental, social, and governance (ESG) pressure on the non-financial performance of small and medium-sized enterprises (SMEs). In particular, it examines the interaction effect of ESG pressures on the relationship between SMEs' environmental management capabilities and non-financial performance. For this study, a total of 1865 SME lists were obtained through Jeonnam Techno Park and Jeonnam Small Business Job and Economy Promotion Agency. Based on this, a total of 127 questionnaires were returned as a result of a telephone, e-mail, and online survey, and finally, an empirical analysis was conducted based on 120 questionnaires. We conducted an empirical analysis of Korean SMEs and obtained the following results: First, environmental management capabilities have a significant, positive effect on SMEs' non-financial performance. Second, ESG pressure has a significant, negative effect on the non-financial performance of SMEs. Next, we analyzed the moderating effect of ESG pressures and observed that ESG pressures strengthen the positive effect of environmental management capabilities on non-financial performance. Based on the resource-based perspective and institutional theory, this study provides meaningful academic implications by examining environmental management capabilities and ESG pressures, which have not been identified in previous studies, as factors of non-financial performance that are becoming important under the new management paradigm, such as climate change and ESG. Furthermore, while ESG pressure has a significant negative effect on non-financial performance, we find that it is a moderating variable that strengthens the relationship between SMEs' environmental management capabilities and non-financial performance, which has useful academic and practical implications for ESG and strategic management.

Keywords: non-financial performance; environmental management capabilities; ESG pressures; SMEs

1. Introduction

With the recent rise in social and academic interest in environmental, social, and governance (hereafter, ESG) and sustainability, corporate environmental management has become an important issue. Environmental management refers to conducting all organizational processes in an environmentally friendly manner (Yoon and Kim, 2000). Since a firm's consideration of environmental issues is closely related to its sustainability, the firm must prepare for the pressure of environmental issues (Han and Lee, 2024; Sarkis, 2001). The pressure on firms to engage in ESG activities is increasing by the day as stakeholders become more aware of the social role of firms (Baldini et al., 2018). Therefore, SMEs on a global scale view ESG as a burden.

Although SMEs recognize the importance of the new paradigm of ESG, they consider it more important to continue their current business due to their limited resources and small firm size (Markopoulos et al., 2023). In Korea, many SMEs also view ESG as a burden. This is because SMEs incur significant costs and burdens in researching and implementing ESG, and there are difficulties in establishing related systems (Gwon, 2024; Seo and Jung, 2022). In other words, SMEs are reluctant to adopt ESG because their resources and infrastructure are limited (Lim and Jung, 2021). With the growing importance of environmental management, there is a growing need for small and medium-sized enterprises (hereafter, SMEs) as well as large enterprises to consider adopting environmental management. A significant body of research on environmental management focuses on its relationship with financial performance (Ermaya et al., 2020; Hornungova, 2017; Ong et al., 2016) and the impact of adopting it (Ferenhof et al., 2014; Hornungova, 2017; Yoon and Kim, 2000). This is because SMEs that adopt environmental management attract positive attention from consumers, investors, and governments, which can lead to positive business outcomes, such as improved corporate image, brand, and consumer satisfaction (Ong et al., 2016). As consumers, governments, and other stakeholders become increasingly concerned about green issues, SMEs are forced to consider non-financial performance, such as corporate image, consumer and employee satisfaction, and internal process efficiency related to green management (Ong et al., 2016). According to the resource-based view (hereafter, RBV), SMEs' environmental management capabilities can act as strategic assets and significantly impact their sustainable performance (Barney, 1991). With the increasing need for environmental management, capabilities to manage businesses in an environment-friendly manner can affect the non-financial performance of SMEs. However, RBV-based research on the relationship between environmental management capabilities and non-financial performance is inadequate. Therefore, this study assumes that environmental management capability is an important antecedent of the non-financial performance of SMEs, based on the RBV.

SMEs, characterized by limited resources and infrastructure as compared to larger firms, may find it difficult to remain competitive and be excluded from global supply chains if they fail to respond appropriately to ESG pressure (Alkatheeri et al., 2023; Fenwick et al., 2022; Gholami et al., 2022; Han et al., 2022; Park et al., 2022; Suh, 1996;). Therefore, SMEs need to make efforts to respond to ESG pressures (Jang et al., 2023; Pinheiro et al., 2024). Previous research suggests that SMEs facing ESG pressure may have conflicting responses (Alkatheeri et al., 2023; Gholami et al., 2022; Pinheiro et al., 2024; Suh, 1996). Some SMEs may respond actively to ESG pressures by acquiring ESG-related knowledge (Jang et al., 2023), which can improve non-financial performance, such as corporate image, brand, and consumer satisfaction with green firms (Garrido-Ruso et al., 2024; Pinheiro et al., 2024). However, other SMEs may respond passively to ESG pressure (Alkatheeri et al., 2023; Gholami et al., 2022; Suh, 1996) because of their limited human and financial resources (Gholami et al., 2022). In this way, examining the conflicting behaviors of SMEs in response to ESG pressures can provide insight into how SMEs may have different impacts on non-financial performance despite ESG pressures. In particular, many SMEs face ESG management pressures from their supply chain partners because they have recently paid attention to ESG and sustainable management. However, since it is very difficult for Korean SMEs to implement ESG management in reality, responding well is also an important task. Therefore, it is very meaningful and essential to examine the ESG pressure in Korean SMEs in this study. Despite the criticality of the issue, there's a lack of research investigating how different SMEs may respond differently to ESG pressures, and few attempts have been made to identify these opposing effects simultaneously. As the ESG pressures faced by SMEs may have opposite effects on their non-financial performance as independent and moderating variables, this study examines both effects simultaneously.

While several studies have independently examined environmental management capabilities and non-financial performance in SMEs, few have examined the potential moderating role of ESG pressures, particularly in the context of SMEs in Korea. Furthermore, while studies such as Lee and Klassen (2008) and Fullerton and Wempe (2009) have laid the groundwork for understanding environmental management capabilities and non-financial performance, our study differs in that it simultaneously examines ESG pressures as an independent variable and a controlling variable. This study is expected to provide meaningful implications in terms of identifying the relationship between environmental management capabilities, ESG pressures, and non-financial performance, based on the RBV and institutional theory, while also examining the moderating effect of ESG pressures. It aims to answer the following research questions: First, how do environmental management capabilities affect the non-financial performance of SMEs? Second, how do ESG pressures affect non-financial performance? Third, do ESG pressures moderate the relationship between the environmental management capabilities and the non-financial performance of SMEs?

2. Theoretical background and literature review

According to the RBV, a firm's performance can be derived from the resources and capabilities it possesses (Barney, 1991). Firm-specific resources and capabilities can play a key role in creating a sustainable competitive advantage (Barney, 1991; Grant, 1996; Wernerfelt, 1984). Thus, resources and capabilities that are valuable, rare, difficult to imitate, and not easily substituted can act as unique strategic assets for a firm and be a source of sustainable competitive advantage (Barney, 1991). In recent years, both large firms and SMEs have been faced with the need to actively respond to dynamic environments, considering climate change and carbon neutrality. SMEs face demands from various stakeholders for ESG and green management (Appiah-Kubi, 2024; Bakos et al., 2020; Eneizan et al., 2016; Gupta, 1995), which requires them to consider not only financial but also non-financial performance (Al-Mamary et al., 2020; Alves and Lourenco, 2022; Hornungova, 2017). Previous studies considered entrepreneurial orientation, corporate social responsibility (CSR), and green marketing as important antecedents of SMEs' non-financial performance (Al-Mamary et al., 2020; Anwar and Shah, 2021; Bouichou et al., 2022; Eneizan et al., 2016), especially entrepreneurial orientation (Al-Mamary et al., 2020; Anwar and Shah, 2021). For example, Al-Mamary et al. (2020) noted that the more entrepreneurial SMEs are, the more likely they are to respond to new environmental changes by taking risks and seizing opportunities. Therefore, entrepreneurial orientation in SMEs can improve non-financial performance, such as customer satisfaction, corporate image, and brand (Al-Mamary et al., 2020). Another line of research focuses on corporate social responsibility (CSR) as an antecedent of SME non-financial performance (Bouichou et al., 2022). For example, Bouichou et al. (2022) examined the impact of a firm's CSR on financial and non-financial performance as a moderating effect of ethical leadership. They highlighted that CSR can positively impact non-financial performance, such as customer satisfaction and corporate image (Bouichou et al., 2022). Other studies emphasized that green marketing can have a positive impact on non-financial performance, such as corporate image and product quality, due to the increasing regulatory, governmental, and consumer interest in green firms (Eneizan et al., 2016). Thus, previous studies have mainly considered entrepreneurial orientation, CSR activities, and green marketing as the antecedents of non-financial performance. As stakeholder interest in eco-friendly firms increases, SMEs can enhance their firm value through environmental management (Utomo et al., 2020). Unfortunately, few have addressed the potential research on the relationship between SMEs' environmental management capabilities and non-financial performance. Accordingly, this study defines SME non-financial performance as the internal factors of SMEs that promote environmental performance and examines environmental management capacity and ESG pressures as factors of SME non-financial performance based on a resource-based view.

Environmental management refers to the integration of environmental factors into business activities (Bakos et al., 2020; Yoon and Kim, 2000). Some scholars note that environmental management in SMEs can be driven by consumer interest in eco-friendly firms and government pressure (Kim, 2007; Reyes-Rodriguez, 2021; Shah et al., 2016; Zorpas, 2010). Consumer interest and government pressure can influence SMEs to restructure their organizational capabilities and develop environmental management capabilities (Kim, 2007; Reyes-Rodriguez, 2021; Shah et al., 2016 Zorpas, 2010). Therefore, the literature emphasizes the importance of possessing knowledge, skills, and expertise (e.g., adopting environmental certifications and programs) for environmental management (Ferenhof et al., 2014; Perez-Sanchez et al., 2003; Reyes-Rodriguez, 2021; Zorpas, 2010). For example, previous studies emphasize that SMEs are more likely to generate positive performance when they acquire knowledge, improve their skills in environmental management (Ferenhof et al., 2014; Perez-Sanchez et al., 2003), and generate positive performance (Kim, 2007; Reyes-Rodriguez, 2021). Another group of scholars notes that SMEs that are more active in adopting environmental certifications and programs are more likely to perform better and be more advanced in their environmental management than others (Reyes-Rodriguez, 2021; Zorpas, 2010). For example, some SMEs are more likely to include environmental management certifications, such as ISO 14001, or audit systems (EMAS) (Reyes-Rodriguez, 2021; Zorpas, 2010). SMEs with these certifications are expected to possess a higher level of understanding and knowledge of environmental management, as well as more specialized employees than other firms (Jang, 2009; Kim, 2007; Shah et al., 2016). Therefore, such SMEs can grow into competitive firms that use their resources efficiently (Jang, 2009; Kim, 2007; Shah et al., 2016). In conclusion, previous studies have emphasized the importance of SMEs acquiring relevant knowledge, upgrading their competencies and skills, and possessing expertise in environmental management. Based on previous studies, this study defines SMEs' environmental management capabilities as the ability to implement environmentally positive management activities in green business areas. The environmental management capabilities of SMEs can be considered an antecedent of their non-financial performance, but this has not been fully explored in the literature. Therefore, this study considers environmental management capability to positively impact non-financial performance, adopting it as the main independent variable.

Inter-organizational interactions are important for businesses to survive and grow, including meeting stakeholder expectations (Appiah-Kubi, 2024; Meyer and Rowan, 1977). Therefore, if an organization can gain legitimacy for its form and behavior through ongoing institutional interactions, it is more likely to secure the resources it will need to survive and grow in the future (Bitektine, 2011; Hannan et al., 2007). However, if an organization loses legitimacy by failing to meet stakeholder expectations, its survival and growth may be constrained by difficulties in securing resources (DiMaggio and Powell, 1983). According to the institutional theory, firms adapt to the institutional environment based on their search for legitimacy and social acceptance (DiMaggio and Powell, 1983), and are likely to respond to "institutional pressure" to comply with institutions (Scott, 1995). Recently, firms have been implementing ESG management to promote sustainability and environmental management. This paradigm shift in management has a significant impact on SMEs, especially since environmental, social, and governance (ESG), an aspect of the non-financial performance factors of firms, is one of the pressures faced by firms and is considered significant for sustainable management (Fenwick et al., 2022; Han et al., 2022; Jang et al., 2023). As institutional pressure is an important factor in how SMEs organize and execute their strategies (DiMaggio and Powell, 1983; Lee et al., 2024), ESG pressure is likely to influence their strategic direction (Gunarathne et al., 2021). Previous studies have emphasized that firms face pressure from a variety of stakeholders, including customers, governments, environmental regulators, as well as themselves (Lee et al., 2024; Park and Kim, 2023; Sarkis et al., 2010). These pressures include those related to ESG, and SMEs are increasingly required to respond to them. However, some scholars suggest that SMEs facing ESG pressure may exhibit conflicting behaviors (Park and Kim, 2023; Pinheiro et al., 2024). First, firms facing ESG pressure may respond proactively by adjusting their organizational behavior patterns (Park and Kim, 2023). SMEs facing ESG pressure may increase their expertise by acquiring the relevant knowledge (Pinheiro et al., 2024), and respond quickly by utilizing their resources and infrastructure (Park and Kim, 2023). In this case, SMEs' ESG activities can be further strengthened (Park and Kim, 2023). However, some SMEs facing ESG pressure may behave passively (Pinheiro et al., 2024). The pressure faced by SMEs can be burdensome, making it difficult for them to achieve non-financial performance (Pinheiro et al., 2024). Because SMEs do not possess the same resources as larger firms, they are less likely to restructure their strategies when pressure arises and are more likely to react passively because of the cost and time involved (Pinheiro et al., 2024). These studies highlight that ESG pressure can have both positive and negative effects on non-financial performance. Previous studies define ESG as a system for measuring corporate sustainability through environment, society, and governance (Cronin and Doyle-Kent) and view it as stakeholder pressure that promotes sustainable activities of firms (Park and Kim, 2023). Based on this, ESG pressure on SMEs can be viewed as stakeholder expectations for sustainable management of SMEs. This study aims to investigate ESG pressure on SMEs as stakeholder pressure for the implementation of ESG (environment, society, and governance) by SMEs. Therefore, this study argues that ESG pressure can be an antecedent of SMEs' non-financial performance, as well as a moderating variable that can interact with environmental management capabilities to influence SMEs' non-financial performance. Therefore, this study examines the relationship between non-financial performance and ESG pressure as independent and moderating variables.

3. Research hypotheses development

3.1. Environmental management capabilities and non-financial performance of SMEs

According to the resource-based view, a firm's resources and capabilities are key factors in creating a sustainable competitive advantage (Barney, 1991; Grant, 1996; Wernerfelt, 1984). The environmental management capabilities of SMEs can also help create a sustainable competitive advantage for them. Therefore, environmental management capabilities can improve the non-financial performance of SMEs by responding faster to change, satisfying the needs of green consumers, and enhancing the firm's image.

SMEs with environmental management capabilities may have a better understanding of environmental issues than those without, allowing them to respond more quickly to changes (Shah et al., 2016; Zorpas, 2010). When SMEs possess environmental management capabilities, not only do they receive relevant training, but can also improve their quality systems, and operate more efficiently (Zorpas, 2010). In particular, SMEs with environmental management capabilities can quickly acquire ESG-related knowledge and skills and respond proactively by enhancing their expertise (Jang et al., 2023). In other words, SMEs with environmental management capabilities have a high level of understanding of ESG, can quickly acquire related knowledge and skills, and respond quickly to changes because of their expertise. Therefore, the environmental management capabilities of SMEs can have a positive impact on their non-financial performance.

As consumers become more environmentally conscious, SMEs with environmental management capabilities can meet their needs. In particular, as green consumption trends and the needs of green consumers are gaining attention, firms' products and services reflecting these needs and trends are likely to attract attention in the market (Donbi and Zinkhan, 1990; Zorpas, 2010). Owing to consumers' environmental concerns, SMEs are focusing on the importance of building environmental management capabilities (Reyes-Rodriguez, 2021). Additionally, by meeting the needs and consumption trends of green consumers, based on environmental management capabilities, SMEs can receive positive evaluations from stakeholders, which can positively affect the firm's image and reputation (Shah et al., 2016). In other words, SMEs with environmental management capabilities can meet the needs of environmentally conscious consumers and create positive organizational images. Therefore, the environmental management capabilities of SMEs can have a positive impact on their non-financial performance. Therefore, based on the above discussion, the following hypothesis is derived:

H1: Environmental management capabilities of SMEs have a positive impact on their non-financial performance.

3.2. ESG pressures and the non-financial performance of SMEs

According to the institutional theory, firms adapt to their institutional environment by seeking legitimacy and social acceptance (DiMaggio and Powell, 1983), and institutions play an important role in how firms conduct their business activities (North, 1990). Recently, firms have been facing ESG pressure owing to issues, such as climate change. For SMEs, ESG pressures can negatively affect non-financial performance because of a lack of financial and human resources and the need to invest considerable time and money.

In recent years, with the growing importance of ESG, SMEs that form supply chains with other firms, including large firms, have been under pressure to implement ESG management (Garrido-Ruso et al., 2024). However, SMEs are limited by their business environments, lack of financial and human resources, and size; they find it difficult to predict the sustainability of their businesses and are highly sensitive to economic fluctuations (KCCI and Samjong, 2021). For example, Alkatheeri et al. (2023) argue that new pressures, such as ESG, can increase the fixed costs of SMEs and thus act as a burden, while Pinheiro et al. (2024) argue that ESG pressures can be a burden on them, making it difficult for them to achieve non-financial performance. Further, SMEs may not be able to respond quickly to new pressures, making it difficult for them to gain competitive advantages, and are likely to be eventually eliminated from the market (Jang et al., 2023). Thus, ESG pressure can negatively impact non-financial performance.

SMEs are limited by the time and cost of implementing green programs, based on ESG pressure. For example, ESG-related certifications and regulations address a wide range of environmental, social, and governance issues. Consequently, it is time-consuming and costly for SMEs to adopt and implement these new systems. Additionally, SMEs may face difficulties in implementing these systems. In particular, because SMEs are not resource-rich, it is difficult for them to respond to ESG pressures due to issues like organizational strategies and costs (Pinheiro et al., 2024). Consequently, ESG pressure on SMEs can negatively impact non-financial performance.

Therefore, ESG pressure on SMEs may negatively affect their non-financial performance. Based on the above discussion, the following hypothesis is derived:

H2: ESG pressure negatively impacts non-financial performance.

3.3. Moderating effect of ESG pressures

ESG pressures themselves may have a negative impact on non-financial performance because they can be burdensome for SMEs; however, under these ESG pressures, firms may strive to develop their capabilities and grow further (Jung and Park, 2022; Jang et al., 2023; Park and Kim, 2023; Strdman, 2023). Therefore, ESG pressure may further strengthen the positive impact of environmental management capabilities on non-financial performance.

According to the institutional theory, institutional pressure can be an important factor for SMEs to organize and implement their strategies (DiMaggio and Powell, 1983; Lee et al., 2024). Therefore, ESG pressures can significantly impact the strategic direction of SMEs, and SMEs will strive to implement it successfully (Gunarathne et al., 2021). In other words, based on the characteristics of institutional theory, ESG pressures can strengthen the positive relationship between environmental management capabilities and non-financial performance because they can trigger SMEs to strengthen their ESG activities and develop their capabilities.

Pressure can further strengthen the ESG activities of SMEs by driving them to establish appropriate systems or implement ESG management (Park and Kim, 2023). For example, Jung and Park (2022) found that firms' ESG and sustainability activities can have a significant positive impact on financial performance, such as sales and operating income, as well as on non-financial performance. Therefore, ESG pressures may further strengthen the positive relationship between environmental management capabilities and non-financial performance as SMEs strengthen their ESG activities.

ESG pressures can also enable SMEs to strengthen their capabilities and grow and develop. Faced with ESG pressures, SMEs use their own resources and infrastructure to respond and strive to build and improve their environmental capabilities (Park and Kim, 2023). Additionally, they may seek to develop and acquire expertise by acquiring relevant knowledge and responding to ESG pressure (Pinheiro et al., 2024). In turn, ESG pressure may strengthen the positive relationship between environmental management capabilities and non-financial performance, because SMEs can grow and develop capabilities in response to it.

Therefore, ESG pressures can strengthen the positive relationship between environmental management capabilities and the non-financial performance of SMEs. Based on the above discussion, the following hypothesis is derived:

H3: ESG pressure moderates the positive relationship between SMEs' environmental management capabilities and non-financial performance.

The research model for this study is shown in **Figure 1**.

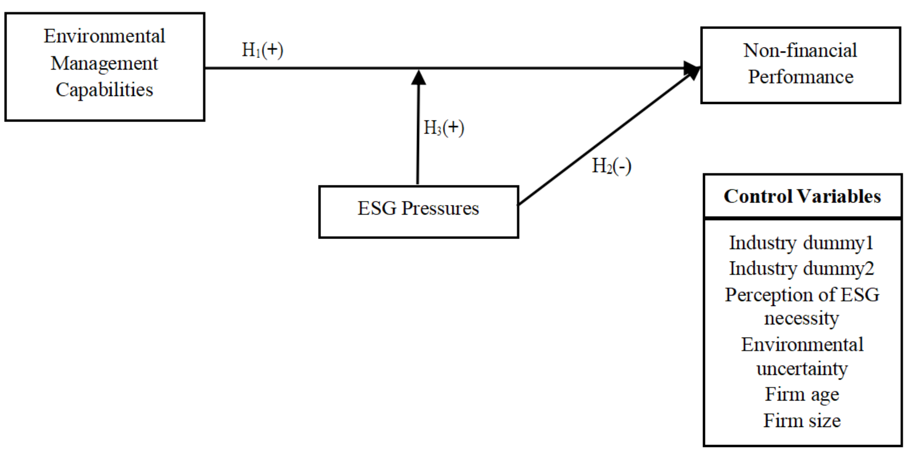

Figure 1. Research model.

4. Methodology

4.1. Data collection

This study examines the impact of environmental management capability and ESG pressure on the non-financial performance of SMEs, focusing on their interaction effect. The target population for this study is Korean SMEs. A total of 1865 SMEs were recruited from Jeonnam Techno Park and the Jeonnam Small Business Job and Economic Promotion Agency. The survey was conducted through various methods such as telephone, email, and online surveys in order to secure more responses, and the survey period lasted for approximately three months, from March to May 2022. To provide more rigorous and objective research, this study excluded cases of dishonest responses, such as missing values or answering all questions equally. A total of 127 questionnaires (6.8%) were returned, and 120 questionnaires (6.4%) were finally used for the empirical analysis, excluding seven that were duplicated or answered insincerely by the SMEs responding to the survey. This study used SPSS 27 for data analysis, through which descriptive statistics, validity, reliability, correlation, and regression analysis were performed. Specifically, descriptive statistical analysis was used to ensure the normality of the variables, and Cronbach's alpha values were checked to verify reliability. In addition, exploratory factor analysis was conducted to verify validity, and the hypothesis was tested through regression analysis.

4.2. Measurement of variables

4.2.1. Dependent variable

The dependent variable in this study is the non-financial performance of SMEs. Following Kim (2019), non-financial performance was measured by agreeing with the following five statements on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree); (i) My company has increased its workforce over the past three years; (ii) My company has increased its employees' sense of belonging over the past three years; (iii) My company has increased its employees' satisfaction with the organization over the past three years; (iv) My company has decreased its employee turnover over the past three years; and (v) My company has increased its image over the past three years.

4.2.2. Independent variables and moderator

The independent variables in this study are environmental management capability and ESG pressure. First, environmental management capability was measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), based on Jeong's (2022) study, to determine the level of agreement with the following six statements; (i) My company invests time and money to develop and implement an environmental protection plan; (ii) My company has a dedicated organization related to the environment; (iii) My company provides training programs to raise employees' awareness of environmental management; (iv) My company's CEO has a strong commitment to environmental management; (v) My company implements programs to protect the environment; (vi) My company actively uses various measures, such as management policies and product production, to protect the environment.

Next, the independent and moderating variable, ESG pressure, was measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree), based on Choi and Yim's (2012) study, to determine the level of agreement with the following four statements: (i) My company is under pressure regarding ESG; (ii) My company is under pressure regarding environmental management; (iii) My company is under pressure regarding social contribution; (iv) My company is under pressure regarding transparency and ethical management.

4.2.3. Control variables

The control variables used in this study are industry dummy, perception of ESG necessity, environmental uncertainty, firm age, and firm size. First, an industry dummy variable was created for industries that comprised a large portion of the research sample and were used in the analysis. Based on Kim's (2022) study, the perceived need for ESG was measured, using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), to indicate the level of agreement with the following 11 statements; i) My company believes that ESG issues and metrics are necessary for business operations; ii) My company believes that the government's 2050 carbon neutrality strategy is necessary for business operations; iii) My company perceives the need to establish a dedicated ESG team; iv) My company perceives the need to hire ESG experts; v) My company perceives the need to provide ESG training to members of the organization; vi) My company believes that ESG management is necessary for business performance; vii) My company believes that ESG management is necessary for shareholder value; viii) My company believes that ESG management is necessary for profitability; ix) My company believes that ESG management is necessary for sustainability; x) My company believes that ESG management is necessary for the future; xi) My company believes that ESG management will be important in the future. Environmental uncertainty was measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree), based on the work of Kang (2016) and Kim (2022), to indicate the degree of agreement with the following three statements; i) the pace of technological change (products and services) in my company's industry is fast; ii) it is difficult to predict trend changes in my company's industry; iii) the market characteristics of my company's industry are changing rapidly

The measurements of the variables used in this study are presented in **Table 1**.

Table 1. Variables and measurement methods.

Variables	Definition	Literature
Non-financial performance	(i) My company has increased its workforce over the past three years; (ii) My company has increased its employees' sense of belonging over the past three years; (iii) My company has increased its employees' satisfaction with the organization over the past three years; (iv) My company has decreased its employee turnover over the past three years, and (v) My company has increased its image over the past three years.	Kim (2019)
Environmental management capability	(i) My company invests time and money to develop and implement an environmental protection plan; (ii) My company has a dedicated organization related to the environment; (iii) My company provides training programs to raise employees' awareness of environmental management; (iv) My company's CEO has a strong commitment to environmental management; (v) My company implements programs to protect the environment; (vi) My company actively uses various measures, such as management policies and product production, to protect the environment.	Jeong (2022)
ESG pressures	(i) My company is under pressure regarding ESG; (ii) My company is under pressure regarding environmental management; (iii) My company is under pressure regarding social contribution; (iv) My company is under pressure regarding transparency and ethical management.	Choi and Yim (2012)
Industry dummy	An Industry dummy variable was created for industries that comprised a large portion of the research sample and were used in the analysis.	Kang (2016), Kim (2022)
Perception of ESG necessity	i) My company believes that ESG issues and metrics are necessary for business operations; ii) My company believes that the government's 2050 carbon neutrality strategy is necessary for business operations; iii) My company perceives the need to establish a dedicated ESG team; iv) My company perceives the need to hire ESG experts; v) My company perceives the need to provide ESG training to members of the organization; vi) My company believes that ESG management is necessary for business performance; vii) My company believes that ESG management is necessary for shareholder value; viii) My company believes that ESG management is necessary for profitability; ix) My company believes that ESG management is necessary for sustainability; x) My company believes that ESG management is necessary for the future; xi) My company believes that ESG management will be important in the future.	Kim (2022)
Environmental uncertainty	i) the pace of technological change (products and services) in my company's industry is fast; ii) it is difficult to predict trend changes in my company's industry; iii) the market characteristics of my company's industry are changing rapidly.	Kang (2016), Kim (2022)
Firm age	2024-Year of establishment	Yang and Lee (2022)
Firm size	Ln (Total number of employees)	Yang and Lee (2022)

5. Results

5.1. Validity and reliability analysis

Table 2 shows the results of the validity and reliability test. The validity analysis showed that the Kaiser-Meyer-Olkin (KMO) value was 0.876, and Bartlett's sphericity test was 3735.554, confirming that there was no problem in proceeding with the factor analysis. Next, the exploratory factor analysis showed that the factor loading values of the measurement items were all above 0.6, confirming that there was no problem in ensuring the validity of the factors to be measured.

Table 2. Validity and reliability test.

Variables	Factor Loadings	Communality	Eigenvalue	Variance Ratio (%)	Cronbach's α
Perception of ESG necessity 1	0.822	0.715	8.405	28.984	0.969
Perception of ESG necessity 2	0.720	0.742			
Perception of ESG necessity 3	0.681	0.668			
Perception of ESG necessity 4	0.640	0.600			
Perception of ESG necessity 5	0.885	0.845			
Perception of ESG necessity 6	0.934	0.923			
Perception of ESG necessity 7	0.918	0.904			
Perception of ESG necessity 8	0.889	0.872			
Perception of ESG necessity 9	0.902	0.909			
Perception of ESG necessity 10	0.909	0.898			
Perception of ESG necessity 11	0.915	0.900			
Environmental uncertainty 1	0.824	0.768	2.059	7.099	0.730
Environmental uncertainty 2	0.714	0.564			
Environmental uncertainty 3	0.842	0.736			
Environmental management capability 1	0.657	0.624	4.252	14.662	0.904
Environmental management capability 2	0.749	0.717			
Environmental management capability 3	0.740	0.714			
Environmental management capability 4	0.717	0.722			
Environmental management capability 5	0.759	0.774			
Environmental management capability 6	0.671	0.621			
ESG pressures 1	0.917	0.910	3.950	12.622	0.967
ESG pressures 2	0.929	0.918			
ESG pressures 3	0.913	0.905			
ESG pressures 4	0.897	0.879			
Non-financial performance 1	0.684	0.551	3.727	12.852	0.874
Non-financial performance 2	0.859	0.819			
Non-financial performance 3	0.839	0.838			
Non-financial performance 4	0.668	0.596			
Non-financial performance 5	0.799	0.759			
Total explained variance = 77.220, KMO = 0.876, Bartlett's test of sphericity = 3735.554, d.f = 406, sig = 0.000.					

5.2. Descriptive statistics and correlation analysis

Table 3 presents the results of the correlation analysis and the descriptive statistics of the measured variables. The variance inflation factor (VIF) value was also checked for the possibility of multicollinearity among the variables. As a result, the maximum value of VIF is 5.711 (the minimum value is 1, and the average value is 2.407), which is within the acceptable value required by previous studies (Chatterjee et al., 2006; Hair et al., 1998).

Table 3. Descriptive statistics and correlation analysis.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Non-financial performance	1								
(2) Industry dummy 1	−0.121	1							
(3) Industry dummy 2	0.214*	−0.037	1						
(4) Perception of ESG necessity	0.356**	−0.208*	0.188	1					
(5) Environmental uncertainty	0.168	−0.157	−0.003	0.130	1				
(6) Firm age	−265**	0.058	−0.103	−0.028	−0.197*	1			
(7) Firm size	−0.071	0.036	−0.042	0.046	−0.172	0.534**	1		
(8) Environmental management capability	0.511**	−0.146	0.211*	0.538**	0.177	0.021	0.065	1	
(9) ESG pressures	0.134	−0.070	0.231*	0.333**	0.117	0.049	0.094	0.474**	1
Mean	3.50	0.08	0.17	3.64	3.52	13.8	2.69	2.79	2.32
S. D.	0.92	0.27	0.13	0.95	0.95	11.2	1.37	0.96	1.10

Notes: * $p < 0.05$, ** $p < 0.01$ (two-tailed).

5.3. Regression analysis

Table 4 presents the results of the regression analysis with non-financial performance as the dependent variable. Model 1 in **Table 4** shows the results of a regression analysis that includes only control variables.

As shown in Model 1, the perception of ESG necessity ($p < 0.01$) and firm age ($p < 0.01$) have, respectively, a significant positive and negative effect on non-financial performance. Model 2 is the result of the regression analysis, including the control and independent variables. As shown in Model 2, environmental management capability ($p < 0.001$) and ESG pressure ($p < 0.1$), respectively, have a significant positive effect and a significant negative effect on non-financial performance. Based on these results, Hypotheses 1 and 2 were accepted.

Model 3 presents the results of the regression analysis, including the control variables, independent variables, and the interaction term (environmental management capability × ESG pressure). The results show that the interaction term of ESG pressure (environmental management capability × ESG pressure, $p < 0.05$) has a significant positive effect on non-financial performance. In other words, ESG pressure strengthens the positive relationship between environmental management and non-financial performance. Therefore, Hypothesis 3 was supported.

Table 4. Regression analysis.

		DV: Non-financial performance		
		Model 1	**Model 2**	**Model 3**
CV	Industry dummy 1	−0.026 (−0.305)	−0.014 (−0.174)	−0.028 (−0.357)
	Industry dummy 2	0.132 (1.549)	0.099 (1.255)	0.071 (0.901)
	Perception of ESG necessity	0.304^{**} (3.470)	0.101 (1.102)	0.122 (1.344)
	Environmental uncertainty	0.086 (0.984)	0.038 (0.479)	0.050 (0.635)
	Firm age	-0.267^{**} (−2.666)	-0.283^{**} (−3.122)	-0.249^{**} (−2.738)
	Firm size	0.079 (0.797)	0.070 (0.773)	0.074 (0.830)
IV/MV	Environmental management capability (EMC)		0.503^{***} (5.152)	0.476^{***} (4.915)
	ESG pressures (ESGP)		$-0.159^{\dagger}$ (−1.808)	-0.197^{*} (−2.229)
ME	EMC × ESGP			0.174^{*} (2.132)
R^2		0.219	0.371	0.396
Adjusted R^2		0.177	0.325	0.346
R^2 Change			0.152	0.177
F		5.243^{***}	8.113^{***}	7.949^{***}

Notes: 1. † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (2-tailed); 2. Numbers are standardized regression coefficients.; 3. Numbers in parentheses are t-statistics.; 4. DV = Dependent Variable, CV = Control Variables, IV = Independent Variables, MV = Moderating Variable, ME = Moderating Effect.

6. Conclusions

6.1. Summary and discussion

Using the resource-based perspective and institutional theory, this study empirically analyzes the impact of environmental management capabilities and ESG pressures on the non-financial performance of SMEs, focusing on the interaction effect of environmental management capabilities and institutional pressures. The results of the empirical analysis of Korean SMEs are as follows. First, we found that environmental management capabilities have a significant positive effect on the non-financial performance. These results suggest that environmental management capabilities can improve non-financial performance by positively influencing SMEs to respond quickly to changes (Shah et al., 2016; Zorpas, 2010), meet green consumers' needs (Donbi and Zinkhan 1990; Zorpas, 2010), and improve their corporate image (Shah et al., 2016). Second, ESG pressures have a significant negative impact on the non-financial performance of SMEs. These results suggest that ESG pressures may have a negative impact on non-financial performance because SMEs under ESG pressures may lack financial and human resources (KCCI and Samjong KPMG, 2021), and require large investments of time and money (Pinheiro et al., 2024).

In contrast, ESG pressure, as a moderating variable, strengthens the positive effect of environmental management capability on non-financial performance. ESG pressure negatively affects non-financial performance. However, when ESG pressure interacts with environmental management capability as a moderating variable, it positively affects non-financial performance. In other words, ESG pressure can act as a burden and negatively affect non-financial performance, but can also act as an opportunity to strengthen ESG activities and develop SME capabilities (Park and Kim, 2023; Pinheiro et al., 2024), thus strengthening the positive relationship between environmental management capabilities and non-financial performance.

As a result of the empirical analysis, all the hypotheses of this study were accepted. In summary, this study first suggested that the non-financial performance of Korean SMEs can increase as they improve their environmental management capabilities. Second, it was suggested that ESG pressure itself negatively affects the non-financial performance of Korean SMEs, but the positive effect on non-financial performance can be further enhanced by environmental management capabilities through ESG pressure.

Unlike previous studies, these findings are differentiated in that they present the relationship between environmental management capabilities, ESG pressures and non-financial performance, and verify and present the moderating effect that ESG pressures can strengthen the positive relationship between environmental management capabilities and non-financial performance. In particular, this study provides meaningful results by presenting contradictory findings that ESG pressures have a negative (−) effect on non-financial performance, but a positive (+) moderating effect on the relationship between environmental management capabilities and non-financial performance.

This study can contribute by proposing theoretical, practical, and new directions as follows. First, this study can make a theoretical contribution by combining the resource-based view and the institutional theory for SMEs that are in a new management paradigm change such as climate change and ESG. And through the results of this study, meaningful practical contributions are possible by presenting core competencies that Korean SMEs should pay attention to in the current rapidly changing management paradigm. Based on this, it also contributes to the presentation of new environmental management strategies for many SMEs.

6.2. Implication

The results of this study have several implications. First, this study provides meaningful academic implications by identifying the effects of environmental management capabilities and ESG pressure on the non-financial performance of SMEs by combining a resource-based perspective and institutional theory for these businesses that are facing changes in new management paradigms, such as climate change and ESG. Second, this study provides useful practical implications by demonstrating the contrary effect of ESG pressure, which has a negative effect on non-financial performance; however, when interacting with environmental management capabilities, it can strengthen their positive relationship with the non-financial performance of SMEs.

6.3. Limitations and suggestions for future research

Despite these implications, this study has several limitations. First, it analyzes SMEs only in Korea, which may limit the generalizability of the findings. Therefore, future researchers should conduct studies on SMEs in various countries and compare their results with those of this study. Second, as the study was conducted through a survey, it may have contained the subjective views of the respondents. Therefore, future studies should include secondary data. Finally, although there are various antecedents that may affect the non-financial performance of SMEs, this study only considers environmental management capabilities; future studies should consider a wider range of SME capabilities.

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