

Do ISO-Based Management Systems and Board Gender Diversity Enhance ESG Performance? Evidence from ASEAN Banks

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Abstract

The increasing pressure for sustainable business practices has encouraged ASEAN banks to strengthen their environmental, social, and governance (ESG) performance. This study examines the effects of ISO-based management systems (MS) and board gender diversity (BGD) on the ESG performance of ASEAN-5 banks during 2018–2023. By integrating organizational capability and corporate governance perspectives, this study contributes to the limited evidence on ESG determinants in the ASEAN banking sector. Using a quantitative approach with balanced panel data from banks listed on stock exchanges in five ASEAN countries, the analysis was conducted using the estimated generalized least squares (EGLS) method. The Random Effect Model (REM) was selected based on the Chow, Hausman, and Lagrange Multiplier tests. The results indicate that ISO-based management systems have a positive and significant effect on ESG performance, whereas board gender diversity does not have a significant effect. These findings suggest that ISO-based management systems serve as strategic organizational capabilities that enhance ESG performance and support the development of sustainable banking governance among ASEAN banks.

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1. Introduction

Global pressure on responsible business practices has prompted companies, especially banking institutions, to pay more serious attention to Environmental, Social and Governance (ESG) performance. ESG is a comprehensive assessment framework that measures the quality of company management from environmental, social, and governance aspects in an integrated manner (Ajina et al., 2025). In the ASEAN region, the banking sector plays a strategic role in driving a financial market-based economy, so that the quality of ESG management in it has a wide impact on stability and public trust. Regional initiatives such as the ASEAN taxonomy for sustainable finance and ESG reporting standards at the national level show that the region is moving towards sustainable finance in a coordinated manner (Abdullah, 2026). In this context, ESG practices in Southeast Asia have proven to have a positive effect on a company's financial performance, especially when ESG variables are measured symbolically one year ahead (Shakil et al., 2019). However, differences in institutional pressures and regulatory frameworks between countries still lead to significant variations in ESG practices among ASEAN banking companies, so a more in-depth empirical study is needed on the factors that can drive consistent ESG performance improvements.

The two main theoretical frameworks underlying this research are stakeholder theory and Resource-Based View (RBV). Stakeholder theory holds that companies are responsible not only to shareholders, but also to all stakeholders involved, including employees, customers, communities, and regulators. In this context, the adoption of an ISO-based management system and the strengthening of gender diversity on the board of directors is a form of strategic response to the expectations of these stakeholders (Basile et al., 2025). On the other hand, RBV views that sustainable competitive advantage comes from the company's internal resources that are valuable, scarce, and difficult for competitors to replicate. An ISO-based management system that includes an ISO 9001-based Quality Management System (QMS), an ISO 14001-based Environmental Management System (EMS), and an ISO 45001-based Occupational Health and Safety Management System (OHSMS) is a strategic resource that helps companies systematically manage the needs of stakeholders while driving continuous improvement (Alkhawaja et al., 2023). In line with that, the presence of women directors on the board of directors is seen as a valuable human resource that brings a more diverse perspective, experience, and value orientation, especially related to concern for social and ethical issues (Fu et al., 2023). Cross-country studies prove that the gender diversity of boards has a positive effect on sustainability performance, and that a critical mass of at least 30% of female directors is needed for such influence to be statistically significant (Khatri, 2023).

One of the mechanisms that is seen as able to improve ESG performance is the implementation of ISO-based Management Systems. They are designed to systematically manage the needs of stakeholders, both in the internal and external contexts of the organization, while encouraging continuous improvement in the company's operations and procedures. Cross-area studies conducted Feyisetan (2026) using 4,292 companies from Europe, East Asia, and North America empirically proved that QMS and EMS are effective business tools to improve ESG performance. Further, these findings are reinforced by Gutiérrez-Ponce & Wibowo (2024) which revealed that the adoption of ISO 14001 had a positive impact on financial performance, and that the impact was further strengthened when companies combined ISO certification with stronger ESG practices, especially in small-scale companies operating in weak institutional environments. In the K3 dimension, Gavana et al. (2026) proving that companies that adopt ISO 45001 show better productivity and profitability than non-adopter companies, confirming the relevance of OHSMS as an integral component of corporate sustainability strategies.

On the other hand, the composition of the board of directors, especially in terms of gender diversity, is also believed to play an important role in shaping the company's strategic orientation towards sustainability issues. Board gender diversity is understood as the presence of female directors who bring more diverse perspectives in decision-making, especially regarding social and ethical issues. Karkowska (2026) in its study of 96 banks registered in Europe it found that the gender diversity of the board of directors has a significant positive relationship to ESG performance, and that a sustainable business model requires higher gender inclusivity in corporate governance. Studies in emerging market contexts in Egypt also show that the relationship between board gender diversity and ESG performance is moderated by government ownership, so the institutional context also determines the effectiveness of gender diversity in promoting sustainability (Omenihu et al., 2025). However, the nexus between board gender diversity and ESG does not always result in consistent findings, as shown by various studies in emerging markets that report results vary depending on the regulatory context and local market structure (Ab Aziz et al., 2025).

Despite the growing body of literature on ESG performance, several important research gaps remain. First, previous studies examining the relationship between ISO-based management systems and ESG performance have predominantly focused on manufacturing firms or cross-industry samples, while evidence from the banking sector remains limited. Second, studies investigating board gender diversity and ESG performance have produced inconsistent findings, particularly in emerging markets where institutional environments and governance practices differ substantially from those in developed economies. Third, empirical studies simultaneously examining ISO-based management systems and board gender diversity as

determinants of ESG performance in ASEAN banks remain scarce, despite the strategic role of the banking sector in supporting sustainable finance initiatives across the region.

This study contributes to the literature in several ways. First, it extends prior ESG research by focusing specifically on ASEAN-5 banks, a context characterized by heterogeneous regulatory environments and varying levels of ESG maturity. Second, the study integrates organizational capability and corporate governance perspectives by examining ISO-based management systems and board gender diversity within a single empirical framework. Third, this research contributes to the sustainable banking governance literature by providing evidence on how internal management systems and board characteristics influence ESG performance in emerging-market banking institutions. The findings are expected to offer insights for both regulators and banking practitioners seeking to strengthen sustainability governance in the ASEAN region.

Based on this background, this study formulates two main questions: (1) Does the implementation of ISO-based Management Systems have a positive and significant effect on the ESG performance among ASEAN banks? (2) Does the board gender diversity have a positive and significant effect on the ESG performance among ASEAN banks? The purpose of this study is to test and analyze the influence of ISO-based MS and BGD on ESG performance, as well as to make an empirical contribution to the development of sustainable governance in the ASEAN banking sector. The benefits of this research are expected to provide practical implications for bank management in designing ISO certification policies and board governance, as well as serve as a reference for regulators and policymakers in the ASEAN region in formulating ESG standards that are more adaptive and contextual to regional financial market characteristics.

2. Literature Review

ESG performance is an evaluation framework used to measure how effectively companies manage environmental, social, and governance aspects as part of their business strategy (Atan et al., 2018). The concept has evolved from corporate social responsibility into a more structured and measurable approach for assessing sustainability, risk, and firm value (Zhao et al., 2018; Shahbaz et al., 2020). ESG performance reflects non-financial aspects related to sustainability, reputational risk, and management quality that are important for stakeholders and investors (Li et al., 2021). In this study, ESG performance refers to a company's ability to manage environmental, social, and governance dimensions in an integrated manner. The environmental dimension relates to environmental impact management, the social dimension concerns stakeholder and employee relationships, while the governance dimension focuses on

transparency, accountability, and corporate control systems (Atan et al., 2018; Li et al., 2021). ESG performance is measured using Refinitiv ESG Scores, which range from 0 to 100, where higher scores indicate better sustainability performance and ESG disclosure quality (Refinitiv, 2022). In achieving strong ESG performance, companies require effective internal governance mechanisms and organizational capabilities that support sustainability practices and strategic decision-making. One of the important organizational mechanisms supporting sustainability implementation is the adoption of ISO-based management systems.

ISO-based management systems are a set of international standards developed by the International Organization for Standardization to assist organizations in implementing systematic management practices in order to achieve strategic and operational objectives consistently (Nadae et al., 2019; Durak Usar, 2024). According to Fonseca & Carvalho (2019), these standards encompass various governance aspects, ranging from quality, environmental management, to occupational health and safety, each of which is designed to improve organizational efficiency, compliance, and performance. Conceptually, ISO-based management systems represent organizational capabilities that reflect a company's ability to establish integrated policies, procedures, and practices aimed at improving quality, managing environmental impacts, and creating a safe workplace (Fonseca & Carvalho, 2019). Furthermore, Fonseca and Carvalho (2019) and Pacheco et al. (2022) explain that there are three major types of ISO-based management systems commonly implemented in organizations, namely quality management systems (ISO 9001), environmental management systems (ISO 14001) and occupational health and safety management systems (ISO 45001). Although each system is designed to regulate different governance aspects, they complement one another in enhancing operational efficiency, regulatory compliance and overall organizational performance. Besides internal management systems, the effectiveness of sustainability implementation is also influenced by governance quality, particularly the characteristics of the corporate board.

Board gender diversity is an important dimension of corporate governance that reflects the diversity of gender composition within the board of directors or commissioners (Shakil et al., 2020). In modern governance literature, gender diversity is viewed not only as an issue of equality but also as a strategic factor influencing decision quality and corporate performance (Menicucci & Paolucci, 2022; Kabir et al., 2023; Wang et al., 2024). Conceptually, board gender diversity represents heterogeneity within the board that can enrich perspectives, improve the quality of discussions and reduce bias in decision-making processes. The presence of women on boards is believed to bring different perspectives regarding risk management, business ethics and long-term orientation (Li & Chen, 2018). In this study, board gender diversity is defined as the level of gender diversity within the board structure that reflects

variations in perspectives related to corporate supervision and strategic decision-making. Therefore, board gender diversity is positioned as a governance mechanism that influences management quality through improvements in decision-making processes and corporate performance.

Board gender diversity is also associated with governance quality because diverse boards tend to provide broader perspectives, improve the quality of discussions, and strengthen strategic decision-making processes. As a complementary governance perspective, Agency Theory suggests that the presence of female directors may enhance monitoring effectiveness by reducing managerial bias and encouraging more objective oversight. However, the primary explanation in this study remains grounded in Stakeholder Theory, which argues that gender-diverse boards are generally more responsive to stakeholder concerns, including environmental, social, and governance issues. Consequently, board gender diversity is expected to strengthen corporate sensitivity toward sustainability challenges and support improvements in ESG performance (Brahma et al., 2021; Kabir et al., 2023). The relationship between ESG performance, ISO-based management systems, and board gender diversity can further be explained through stakeholder theory and RBV theory as the underlying theoretical foundations of this study.

Stakeholder theory expands the corporate perspective from focusing solely on shareholders to encompassing all stakeholders, including employees, customers, creditors, governments and society (Freeman, 1984). The theory argues that corporate success depends not only on profitability but also on the company's ability to fulfill stakeholder interests through socially and environmentally responsible practices (Lokuwaduge & Heenetigala, 2017). In modern business contexts, stakeholder theory has become an important foundation for explaining ESG performance, as companies with strong ESG practices are considered more capable of meeting stakeholder expectations, enhancing legitimacy, trust and ultimately improving corporate performance (Atan et al., 2018; Hakimi et al., 2023; Shakil et al., 2020). In addition, RBV theory explains that competitive advantage is determined by a company's internal resources and capabilities, including intangible assets such as knowledge, management systems, organizational culture and operational capabilities (Barney, 1991; Pacheco et al., 2022). RBV emphasizes that organizational capabilities enable firms to integrate and utilize resources effectively to achieve superior performance. In this context, ISO-based management systems can be viewed as strategic organizational capabilities that improve efficiency, quality and consistency in business processes, thereby strengthening corporate performance and sustainability practices (Nadae et al., 2019; Tayo Tene et al., 2021).

Based on the above discussion, this study primarily adopts Stakeholder Theory and the Resource-Based View (RBV) as its main theoretical foundations. Stakeholder Theory explains that firms are encouraged to improve ESG performance in response to increasing demands from stakeholders regarding transparency, accountability and sustainability. Meanwhile, RBV emphasizes the importance of internal organizational capabilities in creating sustainable competitive advantages and supporting long-term performance. In this study, ISO-based management systems are viewed as strategic organizational capabilities that facilitate the implementation of sustainability practices and improve ESG performance. Agency Theory is incorporated only as a complementary governance perspective to explain how board gender diversity may strengthen monitoring effectiveness and influence sustainability-related decision-making processes.

ISO-Based Management Systems and ESG Performance

ISO-based management systems are standardized management frameworks designed to ensure that organizational activities operate systematically, are well-documented and are oriented toward continuous improvement (Nadae et al., 2019; Durak Usar, 2024). Standards such as ISO 9001, ISO 14001 and ISO 45001 regulate not only quality aspects, but also environmental management as well as occupational health and safety (Fonseca & Carvalho, 2019; Pacheco et al., 2022). From the perspective of stakeholder theory, the implementation of ISO standards enables companies to meet stakeholder expectations through structured control systems, audits, and reporting mechanisms, thereby enhancing transparency and accountability in ESG practices (Freeman, 1984; Tayo Tene et al., 2021). Meanwhile, the resource-based view explains that ISO-based management systems represent valuable and difficult-to-imitate internal capabilities that can serve as a source of competitive advantage for firms (Barney, 1991).

The implementation of ISO-based management systems encourages companies to integrate ESG indicators into operational processes and decision-making activities. ISO 14001 focuses on controlling environmental impacts, ISO 45001 emphasizes the protection of employee safety and well-being, while ISO 9001 supports service quality improvement, operational efficiency and customer satisfaction. Such integration creates business processes that are more efficient, transparent and accountable. In addition, the PDCA (plan-do-check-act) approach embedded in ISO standards enables continuous evaluation and improvement of corporate sustainability performance (Nadae et al., 2019). Therefore, the higher the level of ISO-based management system implementation, the stronger the company's ability to enhance ESG performance systematically and sustainably.

Several empirical studies support the positive relationship between ISO-based management systems and ESG performance. Nadae et al. (2019) found that companies implementing integrated management systems, such as ISO 9001, ISO 14001 and OHSAS 18001, demonstrated better operational efficiency, process quality and sustainability capability compared to companies without such certifications. Furthermore, Ronalter et al. (2023) showed that firms adopting quality management systems and environmental management systems achieved significantly higher ESG scores, particularly when both systems were implemented simultaneously. These findings were further supported by Gebhardt et al. (2023), who reported that the integration of ESG key performance indicators into internal management systems improved ESG performance, especially in environmental and social dimensions. These findings confirm that the implementation of ISO-based management systems serves as a strategic mechanism for enhancing corporate ESG performance. Based on the theoretical foundation and empirical evidence, the first hypothesis of this study is formulated as follows:

H₁: ISO-based management systems have a positive effect on ESG performance.

Board Gender Diversity and ESG Performance

Board gender diversity refers to the diversity of gender composition within the board of directors or board of commissioners, reflecting variations in perspectives, experiences and values in the company's strategic decision-making process (Shakil et al., 2020). In the context of corporate governance, the presence of women on the board is considered an important element that can enhance the quality of supervision and broaden the orientation of corporate decisions, particularly in responding to increasingly complex sustainability issues (Nuhu & Alam, 2024). In practice, board gender diversity enables companies to integrate multiple perspectives in formulating corporate policies, including environmental, social and governance policies. Moreover, gender diversity improves transparency and accountability in ESG reporting due to stronger encouragement to meet broader stakeholder expectations (Wasiuzzaman & Wan Mohammad, 2020). From the perspective of stakeholder theory suggests that companies are required to address the interests of various stakeholders, including environmental and social concerns (Freeman, 1984). Board gender diversity plays a significant role in enhancing corporate sensitivity toward sustainability issues because women tend to place greater emphasis on ethics, social responsibility and environmental impacts in decision-making processes (Menicucci & Paolucci, 2022). As a result, the presence of women on the board encourages companies to become more responsive to stakeholder demands and to improve the quality of ESG performance implementation. In addition, greater female representation on the board contributes to stronger transparency and accountability in ESG disclosure, reflecting enhanced responsiveness to stakeholder expectations and sustainability

reporting practices (Wasiuzzaman & Wan Mohammad, 2020). Therefore, the higher the level of board gender diversity, the stronger the company's ability to improve ESG performance and sustainability disclosure practices.

Empirical evidence demonstrates that board gender diversity plays an important role in improving corporate ESG performance. Menicucci and Paolucci (2022) in a study of the Italian banking sector, found that gender diversity on boards positively affects ESG performance, although the relationship becomes non-linear at certain levels of female representation. Similarly, Shakil et al. (2020) found a significant positive relationship between board gender diversity and ESG performance in U.S. banks, indicating that board diversity enhances the quality of strategic sustainability-related decisions. Furthermore, Wasiuzzaman and Wan Mohammad (2020) reported that a higher proportion of women on boards is associated with greater ESG disclosure, reflecting stronger accountability and transparency toward stakeholders. These findings were reinforced by Nuhu and Alam (2024), who showed that board gender diversity positively influences ESG disclosure in companies operating in emerging economies. Collectively, these studies confirm that the presence of women on corporate boards serves as a strategic governance mechanism that strengthens sustainability orientation, improves ESG disclosure quality and directly enhances corporate ESG performance. Based on this description, the hypotheses of these two studies are formulated as follows:

H₂: Board gender diversity has a positive effect on ESG performance.

3. Research Methods

This study uses a quantitative approach with a data panel design that combines the cross-section dimension and the time-series dimension simultaneously. This design was chosen because it is able to control heterogeneity between companies that are not observed while capturing the dynamics of changes in ESG performance throughout the observation period. The research population includes all banking companies listed on the stock exchanges of ASEAN countries, including Indonesia, Malaysia, Philippines, Singapore and Thailand. Referring to the framework developed, the ASEAN-5 region was chosen because it has comparable and relatively homogeneous bank-based financial system characteristics, and has adopted various regional initiatives towards sustainable finance under the framework of the ASEAN taxonomy for sustainable finance. The observation period was set from 2018 to 2023 with consideration of the availability of data and relevance to the development of ESG policies in the region.

This study uses the population as an analysis unit, where all banking companies listed on the stock exchanges of the five ASEAN countries and have complete data are the object of the research. After a selection process based on the completeness of the annual report data and the availability of ESG scores in the refinitiv eikon database, 28 banks were obtained that produced 168 balanced panel observations over six years. Data for all variables were collected from two main sources. Independent variables are obtained manually from each company's annual report, while dependent variables are obtained from refinitiv eikon, a financial and sustainability data platform that provides a comprehensive ESG score based on more than 186 metrics. As confirmed, the use of ESG data from refinitiv eikon has become a prevalent standard in academic research due to its methodological consistency and broad data coverage. The operational definition of all the variables used is presented in the following table:

Table 1. Variable Operational Definition

Variable	Definition	Measurement	Data Source
ESG Performance (ESGP)	A company's sustainability performance that includes three pillars: environmental, social, and governance	Aggregate ESG score from <i>Refinitiv Eikon</i> (0–100)	<i>Refinitiv Eikon</i>
ISO-based Management System (ISO)	Ownership of ISO-based management system certifications, including QMS (ISO 9001), EMS (ISO 14001), and OHSMS (ISO 45001)	Number of types of ISO certifications the company has	Annual Report
Gender Diversity Board (BGD)	Proportion of female directors in the composition of the board of directors	The number of female directors divided by the total number of members of the board of directors	Annual Report

Source(s): Authors' own work (2025)

Data processing in this study was conducted using E-views software with the panel estimated generalized least squares (EGLS) approach. The selection of the most appropriate panel data regression model was carried out through several stages of model specification testing, including the chow test, hausman test and lagrange multiplier test. The Chow test was used to edetermine the appropriate model between the common effect model (CEM) and the fixed effect model (FEM), while the hausman test was employed to compare the fixed effect model (FEM) and the random effect model (REM) in terms of efficiency and consistency. Furthermore, the lagrange multiplier test was conducted to ensure whether the random effect model (REM) was more appropriate than the common effect model (CEM) (Baltagi, 2005).

Before estimating the final regression model, classical assumption tests were conducted to ensure the validity and reliability of the regression model. These tests included normality, multicollinearity, heteroscedasticity, and autocorrelation tests. The results indicated that the regression model fulfilled all classical assumption requirements, suggesting that the estimated regression coefficients could be interpreted consistently, validly and without bias. The panel data regression model used in this study is formulated as follows:

$$ESGP_{it} = \alpha + \beta_1 ISO_{it} + \beta_2 BGD_{it} + \epsilon_{it}$$

Where ESGP represents the ESG performance of banking companies *i* in period *t*; MS refers to the ISO-based management system variable; BGD represents board gender diversity; α denotes the constant; β_1 and β_2 are the regression coefficients of each independent variable; and ϵ_{it} represents the error term.

4. Results

Descriptive Statistics

The first step in this quantitative analysis is to examine the descriptive statistical characteristics of all the variables used in the model. Descriptive statistics provide an initial overview of the distribution, central tendencies, and levels of variation of the data before further estimates are made. The results of descriptive statistical analysis of 168 *balanced panel* observations are presented in Table 2 below.

Table 2. Descriptive Analysis

Variable	Obs	Mean	Std Dev	Min	Max
ESGP	168	64.09	12.33	36.55	87.45
ISO	168	2.54	0.54	0.00	3.00
BGD	168	0.23	0.12	0.00	0.70

Source: Data processed (2025)

Table 2 presents the descriptive statistics of the variables used in this study. ESG Performance (ESGP) has a mean value of 64.09, with a minimum value of 36.55 and a maximum value of 87.45, indicating substantial variation in sustainability performance among ASEAN banks during the observation period. The ISO-based Management Systems (ISO) variable records an average value of 2.54, ranging from 0 to 3, which suggests that most sampled banks have implemented more than two ISO-based management system certifications and demonstrate a relatively strong commitment to standardized management practices. Meanwhile, Board Gender Diversity (BGD) has a mean value of 0.23, indicating that female directors represent

approximately 23 percent of total board membership on average, with values ranging from 0.00 to 0.70 across the sample. Overall, the descriptive statistics indicate considerable variation in ESG performance, ISO certification adoption and board gender diversity among ASEAN banks, providing sufficient variability for further panel data analysis to examine the relationships among the study variables.

Table 3. Result of Panel Data

Variable	Pooled	FEM	REM
ISO	3.458656 (0.0014)	3.463796 (0.0731)	3.120075 (0.0012)
BGD	-4.007733 0.6082	-5.795650 (0.0762)	-13.33415 (0.4244)
C	56.25871	56.67091	59.33762

Source: Data processed (2025)

Table 3 presents the results of the panel data regression analysis using the Pooled Ordinary Least Squares (Pooled OLS), Fixed Effect Model (FEM), and Random Effect Model (REM). The results show that the ISO-based Management Systems (ISO) variable has a positive coefficient in all estimation models and is statistically significant in the Pooled OLS and REM models, with coefficient values of 3.458656 ($p = 0.0014$) and 3.120075 ($p = 0.0012$), respectively. These findings indicate that the implementation of ISO-based management systems positively contributes to ESG Performance. In the FEM model, the coefficient remains positive at 3.463796; however, the probability value of 0.0731 indicates that the effect is not statistically significant at the 5 percent significance level.

Meanwhile, the Board Gender Diversity (BGD) variable exhibits negative coefficients across all estimation models, namely -4.007733 in the Pooled OLS model, -5.795650 in the FEM model, and -13.33415 in the REM model. The probability values of 0.6082, 0.0762, and 0.4244, respectively, are all above the 5 percent significance threshold, indicating that board gender diversity does not have a statistically significant effect on ESG Performance. In addition, the constant values for the Pooled OLS, FEM, and REM models are 56.25871, 56.67091, and 59.33762, respectively. Since the Random Effect Model (REM) was selected as the most appropriate estimation model, the interpretation of the regression coefficients and hypothesis testing is based on the REM results.

Table 4. Result of Chow, Hausman and Lagrange Multiplier Test

Test	Chi-Squared	Prob
Chow	227.449930	0.0000
Hausman	0.527961	0.7680
Lagrange Multiplier	0.0000	0.0000

Source: Data processed (2025)

Table 4 presents the results of the model selection tests, including the Chow test, Hausman test, and Lagrange Multiplier (LM) test. The Chow test yields a probability value of 0.0000, indicating that the Fixed Effect Model (FEM) is preferred over the Common Effect Model (CEM). Furthermore, the Hausman test produces a probability value of 0.7680, which exceeds the 5 percent significance level, suggesting that the Random Effect Model (REM) is more appropriate than the FEM. The LM test also reports a probability value of 0.0000, indicating that the REM is preferable to the CEM. Therefore, based on the results of the three model selection tests, the Random Effect Model (REM) is identified as the most appropriate estimation model and is subsequently used for regression interpretation and hypothesis testing.

Table 5. Results of Classical Assumption Test

No.	Test Type	Indicator	Testing Requirements	Test Results	Conclusion
1	Normality Test	Prob. Jarque Bera	Prof JB > 0.05	0.1895	No problem
2	Multicollinearity Test	VIF value	VIVID < 10	ISO (1.2); BGD (1.2)	No problem
3	Heteroscedasticity Test	Prob. Chi Square	Prob > 0.05	0.0981	No problem
4	Autocorrelation Test	Prob Chi Square	Prob > 0.05	0.4510	No problem

Source: Data processed (2025)

Table 5 presents the results of the classical assumption tests conducted to ensure the validity and reliability of the panel data regression model. The normality test using the Jarque-Bera probability indicates that the residuals are normally distributed, suggesting that the model fulfills the normality assumption. Furthermore, the multicollinearity test shows that all independent variables have VIF values below the critical threshold, indicating the absence of multicollinearity among the explanatory variables. The heteroscedasticity test also demonstrates that the model does not suffer from heteroscedasticity problems, while the autocorrelation test confirms that there is no autocorrelation issue within the regression model. Overall, these findings indicate that the regression model satisfies all classical assumption requirements, meaning that the estimated regression coefficients can be interpreted consistently, validly and without bias.

Panel EGLS Estimation Result and Hypothesis Testing

The final estimate was carried out using the EGLS panel method with cross-section random effects. The results of the complete estimation along with the coefficient significance test and the model feasibility test are presented in Table 6 below.

Table 6. Result of Panel FGLS Estimation

Dependent Variable: ESGP				
Method: Panel EGLS (Cross-section random effects)				
Total panel (balanced) observations: 168				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	56.67091	3.613561	15.68284	0.0000
ISO	3.463796	1.051785	3.293256	0.0012
BGD	-5.795650	7.237614	-0.800768	0.4244
R-squared			0.62770	
Adjusted R-squared			0.51409	
F-statistic			25.525330	
Prob(F-statistic)			0.004757	

Source: Data processed (2025)

Therefore, panel data regression model can be formulated as follows:

$$ESGP = 56.670 + 3.463*ISO - 5.795*BD$$

Referring to Table 6, the ISO-based management systems (ISO) variable shows a positive value coefficient with a probability value below the significance threshold of 5%. This confirms that each addition of one unit of ISO certification adoption consistently improves the ESGP performance among ASEAN banks in the sample, assuming other variables are constant. These findings confirm that ISO certification, which includes QMS, EMS and OHSMS, serves as an effective internal governance mechanism in disciplining operational processes, expanding accountability and building the trust of external stakeholders, so that H1 is accepted.

On the other hand, the board gender diversity (BGD) variable shows a negative coefficient with a probability value that exceeds the significance threshold of 5%, so that it is not statistically proven to have a significant effect on the ESG performance of ASEAN banks in this observation period. H2 was rejected. This may reflect that the average proportion of women directors who are still limited has not reached the critical point needed for the influence of gender diversity to be measurably manifested in ESG-related strategic decisions. In addition, the diversity of regulatory pressures and differences in governance culture among ASEAN countries also contribute to the weak influence of BGD on ESG performance in the region in

the aggregate. The F-statistical value of 25.5253 with a probability of 0.004757 (< 0.05) shows that the MS and BGD variables together have a significant effect on the ESG performance of ASEAN banks. The R-squared value of 0.6277 indicates that approximately 62.77% of the variation in ESG performance in the sample can be explained by the MS and BGD variables in the model, while the remaining 37.23% is influenced by other factors beyond the scope of the study.

Discussion

The Influence of ISO-based Management Systems on the ESG Performance

The empirical results of this study demonstrate that the implementation of ISO-based management systems has a positive and significant effect on ESG performance in banking companies across the ASEAN region. This finding is indicated by a probability value below the 5% significance level and a positive regression coefficient, confirming that the first hypothesis (H1) is supported. The results suggest that the more comprehensive the adoption of international standards such as ISO 9001, ISO 14001 and ISO 45001, the higher the company's ESG performance. This indicates that ASEAN banks increasingly position standardized management systems not merely as administrative requirements, but as strategic foundations for achieving measurable sustainability objectives.

From a theoretical perspective, these findings are consistent with the RBV theory, which emphasizes the importance of internal capabilities as sources of long-term competitive advantage (Barney, 1991). ISO-based management systems can be viewed as valuable and difficult-to-imitate strategic organizational resources that enhance operational efficiency, governance quality and environmental management. Through the integration of quality, environmental and occupational health and safety standards, banking institutions are better able to implement sustainability strategies systematically and efficiently (Gebhardt et al., 2023). In addition, stakeholder theory explains that ISO standards help companies respond to stakeholder expectations related to transparency, accountability and sustainability, thereby strengthening institutional legitimacy and stakeholder trust (Freeman, 1984; Pacheco et al., 2022; Ronalter et al., 2023).

The positive effect of ISO-based management systems on ESG performance can also be explained through the contribution of each international standard. ISO 14001 supports environmental management by encouraging companies to identify, monitor and reduce environmental impacts, thereby improving the environmental dimension of ESG (Widiastuti et al., 2022). Meanwhile, ISO 45001 contributes to the social dimension through improvements in occupational health and safety, employee welfare, and productivity, whereas ISO 9001

strengthens governance practices through process standardization, customer satisfaction, documentation quality and internal control systems (Ronalter et al., 2023). These integrated standards collectively strengthen corporate sustainability practices and ESG implementation.

The findings of this study are supported by several previous studies. Nadae et al. (2019) found that integrated management systems based on ISO 9001 and ISO 14001 significantly improve corporate sustainability capabilities and facilitate the internalization of ESG values into organizational routines. Similarly, Ronalter et al. (2023) reported that companies adopting quality management systems and environmental management systems achieve significantly higher ESG scores than firms without such systems. Furthermore, Gebhardt et al. (2023) explained that integrating sustainability indicators into management systems improves reporting discipline and ensures that ESG objectives are implemented consistently across all managerial levels. Overall, these studies provide strong empirical evidence that ISO-based management systems play a strategic role in enhancing ESG performance in the financial sector.

The Influence of Board Gender Diversity on the ESG Performance

The empirical results of this study indicate that board gender diversity (BGD) has a negative and significant effect on ESG performance in banking companies across the ASEAN region. This finding is evidenced by a probability value below the 5% significance level and a negative regression coefficient, indicating that an increase in the proportion of women on the board is associated with lower ESG performance. Therefore, the second hypothesis (H2) is not supported. These results suggest that the presence of female directors has not yet been effectively translated into stronger sustainability strategies within ASEAN banking institutions. Instead, the findings imply that the increasing representation of women on boards may still face structural and organizational barriers that limit their influence on ESG-related decision making.

From the perspective of stakeholder theory argues that female representation should enhance corporate sensitivity toward social and environmental issues; however, in the ASEAN context, the findings indicate the possibility of symbolic representation rather than substantive participation (Manita et al., 2017). As a result, the presence of women on boards may not yet be sufficient to strengthen ESG implementation due to existing structural and cultural constraints within regional corporate environments. The findings of this study are consistent with several previous studies. Manita et al. (2017) found that board gender diversity did not significantly influence ESG disclosure because women often lacked strategic positions and substantive influence within board structures. Similarly, Al-Jaifi (2020) reported that board

gender diversity in ASEAN countries primarily affected governance aspects rather than environmental and social dimensions, indicating that the impact of female directors remains partial and context-dependent. These findings suggest that regional institutional characteristics, organizational culture and governance structures strongly influence the effectiveness of gender diversity in improving ESG performance.

In addition, Omenihu et al. (2025) argued that board gender diversity contributes positively to ESG performance only when female representation reaches a critical mass that allows women to meaningfully influence board decisions. When female representation remains limited, tokenism may occur, where women serve only as symbolic figures without substantial decision-making power. This explanation is highly relevant to the present findings, as many ASEAN banking companies may not yet have achieved the level of female representation necessary to generate a positive impact on ESG performance. Therefore, the relationship between board gender diversity and ESG performance appears to be non-linear and highly dependent on the quality and effectiveness of women's participation within corporate boards.

5. Conclusion and Suggestion

Conclusion

This study aims to examine the effect of ISO-based management systems and board gender diversity on ESG performance in the banking sector across the ASEAN region. The findings reveal that ISO-based management systems have a positive and significant effect on ESG performance, indicating that the adoption of internationally recognized management standards contributes to enhancing sustainability practices within the banking sector. In contrast, board gender diversity does not exhibit a significant effect on ESG performance, suggesting that the current level of female representation on corporate boards may not yet be sufficient to influence sustainability-related strategic decisions effectively. Overall, the results highlight the importance of ISO-based management systems as strategic organizational capabilities that support ESG performance and contribute to the development of sustainable banking governance in the ASEAN banking sector.

Despite these findings, several limitations should be acknowledged. This study focuses exclusively on listed banks in five ASEAN countries and considers only ISO-based management systems and board gender diversity as the main explanatory variables. Consequently, other factors that may influence ESG performance, such as financial digitalization, institutional quality, ownership structure, and regulatory pressure, are not

incorporated into the analysis. In addition, the use of Refinitiv ESG scores may not fully capture all dimensions of sustainability practices implemented by ASEAN banks.

Suggestions

Based on these findings, ASEAN banks are encouraged to strengthen the implementation and integration of ISO-based management systems as a foundation for improving sustainability performance and ESG practices. Regulators and policymakers may also consider promoting a more harmonized ESG framework across ASEAN countries to support consistent sustainability implementation within the regional banking sector. Future studies are recommended to incorporate additional governance, institutional and technological variables, as well as broader samples from different industries and regions, in order to provide a more comprehensive understanding of the determinants of ESG performance and sustainable banking governance.

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