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DOES FOREIGN OWNERSHIP AMPLIFY THE IMPACTS OF ENVIRONMENTAL MANAGEMENT SYSTEM AND ENVIRONMENTAL COST ON ASRRAT?

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Abstract: *Nowadays, firms are expected to demonstrate both financial performance and environmental accountability, increasing the importance of sustainability reporting quality. Nevertheless, internal environmental efforts do not necessarily result in better reporting outcomes, and the role of ownership structure remains underexplored. This study examines the effects of Environmental Management System (EMS) and Environmental Cost (EC) on the Asia Sustainability Reporting Rating (ASRRAT), involving Foreign Ownership as a moderating variable. The sample comprises 11 firms that consistently participated in ASRRAT from 2018 to 2024, resulting in 77 firm-year observations. Secondary data were collected from annual reports, sustainability reports, and records from the National Center for Corporate Reporting (NCCR). Ordinal logistic regression was used in the analysis, measuring ASRRAT as an ordered categorical variable. The results show that both EMS and EC positively affect ASRRAT. Similarly, Foreign Ownership also has a positive direct effect on ASRRAT. Furthermore, it strengthens the relationship between EMS and ASRRAT, but it does not significantly moderate the relationship between Environmental Cost and ASRRAT. These findings suggest that effective internal systems, supported by stronger external monitoring, can improve the quality of sustainability reporting.*

Keywords: Environmental Management System, Environmental Cost, Foreign Ownership, Asia Sustainability Reporting Rating (ASRRAT)

INTRODUCTION

In increasingly demanding capital markets, businesses have used sustainability reporting—which is initially a voluntary disclosure practice—as a strategic instrument to secure legitimacy and demonstrate accountability. Under the broader logic of stakeholder capitalism, businesses are expected not only to perform financially but also to disclose how their operations conform to environmental and social standards, including those outlined in the Sustainable Development Goals (SDGs). Such conformity to prevailing social norms may reduce public pressure and enhance organisational stability, making the quality of sustainability reporting a key determinant of corporate credibility among investors and other stakeholders (Tiranda et al., 2025).

The Asia Sustainability Reporting Rating (ASRRAT), organised by the National Center for Corporate Reporting (NCCR), has emerged as a prominent benchmark for assessing the quality of sustainability reporting. Businesses in Indonesia, the Philippines, Bangladesh, and other Asian countries are increasingly participating in this platform, suggesting that sustainability disclosure is being viewed as a strategic tool in a competitive regional setting. However, broader participation does not necessarily translate into constant reporting quality. According to ASRRAT records, certain companies experience rating volatility over time, including declines from Platinum to Gold

or lower categories. This implies that participation alone does not guarantee consistently credible reporting outcomes. Such instability is consequential since fluctuations in reporting quality can put businesses at risk of losing their credibility, especially when disclosure is perceived as compliance-driven rather than grounded in substantive internal practices.

Previous studies have investigated whether internal environmental efforts improve the quality of sustainability reporting, particularly through the implementation of Environmental Management System (EMS) and the disclosure of Environmental Cost (EC). Nevertheless, empirical evidence remains inconclusive. Several studies show that EMS enhances the credibility of reporting through structured procedures, monitoring routines, and documented compliance mechanisms (Joy-Camacho & Thornhill, 2024; Treacy et al., 2019). On the other hand, other studies highlight that certification may be used symbolically and may not always result in higher-quality reporting (Voinea et al., 2020). Similarly, the literature on Environmental Cost also reports inconsistent findings. According to some studies, environmental expenditure improves disclosure quality and corporate credibility as it reflects tangible commitment through resource allocation (Romli & Reza Zaputra, 2022; Safitri et al., 2024). Conversely, other studies identify weaker or insignificant effects, particularly when such expenditure does not adequately capture the effectiveness of environmental action (Pedron et al., 2021). Overall, these conflicting findings suggest that internal environmental commitment alone may not be sufficient to produce better reporting outcomes.

One plausible explanation for this inconsistency lies in the role of external monitoring. When internal environmental systems and expenditures operate within a governance framework that encourages substantive implementation rather than symbolic compliance, they are more likely to improve the quality of sustainability reporting. Foreign Ownership is particularly relevant in this context. Foreign investors are more motivated to demand transparency, better governance quality, and more reliable disclosure as they frequently confront greater information asymmetry and investment risk (Arayssi et al., 2020; Wardani et al., 2025). Furthermore, foreign shareholders often have higher ESG expectations than domestic investors, thus representing greater accountability pressures (Dewi & Honggowati, 2023; Kustinah, 2022). Therefore, Foreign Ownership may not only have a direct effect on the quality of sustainability reporting but also increase the extent to which EMS and EC result in higher ASRRAT categories.

This study aims to address the gap in the literature by investigating three research questions: 1) whether EMS affects ASRRAT; 2) whether Environmental Cost affects ASRRAT; and 3) whether Foreign Ownership strengthens the effects of EMS and Environmental Cost on ASRRAT. The analysis used empirical data focusing on Indonesian firms that consistently participated in ASRRAT during the 2018–2024 period, reflecting the Indonesian institutional setting while staying embedded in a regional sustainability reporting evaluation framework. The remainder of the paper presents the theoretical framework, research methods, results and discussions, and conclusions.

THEORETICAL FRAMEWORK AND HYPOTHESES

Legitimacy Theory

The Legitimacy Theory holds that an organisation's ability to survive depends on the extent to which its activities are perceived as congruent with prevailing social norms, values, and expectations (Dowling & Pfeffer, 1975; Suchman, 1995). From this perspective, disclosure is not merely an informational mechanism; it is also a strategic tool for gaining, maintaining, or restoring corporate legitimacy in the eyes of stakeholders. According to Deegan (2002), social and environmental disclosure may function as a legitimacy-restoring device, particularly when stakeholders demand that firms demonstrate responsibility for aspects beyond financial performance. In the present context, both the implementation of Environmental Management System (EMS) and the disclosure of Environmental Cost (EC) can be viewed as legitimacy-relevant signals because they provide tangible evidence that corporate commitment to the environment is ingrained in business operations rather than being solely communicated through narrative claims.

Agency Theory

According to the Agency Theory, conflicts may occur between principals and agents because managers have more information and may not always act in the best interests of the shareholders (Jensen & Meckling, 1976). Governance mechanisms—such as ownership structure—become crucial in these situations, as they reduce information asymmetry and strengthen managerial monitoring. Foreign Ownership, in particular, is frequently associated with stronger monitoring incentives. Foreign investors typically face higher information risk, greater

geographic distance, and more restricted direct access to internal managerial processes. Consequently, they tend to call for more transparent, credible, and comparable disclosure to protect investment value and reduce uncertainty (Arayssi et al., 2020; Wardani et al., 2025). In the context of sustainability reporting, the Agency Theory provides a useful foundation for elucidating the direct governance function of Foreign Ownership and its potential moderating influence in increasing the reporting value of internal environmental practices.

Environmental Management System and Asia Sustainability Reporting Rating (ASRRAT)

An Environmental Management System (EMS) is expected to improve the quality of sustainability reporting through structured procedures, monitoring routines, documentation, and auditable controls that enhance the credibility of environmental information. According to the Legitimacy Theory, this system allows businesses to demonstrate that their commitment to environmental responsibility is supported by recognised organisational processes rather than relying solely on symbolic declarations. Specifically, ISO 14001-based systems may enhance the credibility of sustainability reporting by closing the gap between managerial claims and verifiable implementation. Although some studies underline that certification may sometimes be adopted symbolically and thus may not necessarily enhance reporting quality (Voinea et al., 2020), prior studies generally indicate that EMS and environmental certification increase disclosure credibility and sustainability-related outcomes by promoting standardisation and transparency in reporting practices (Joy-Camacho & Thornhill, 2024; Sam & Song, 2022; Treacy et al., 2019). Principally, EMS is anticipated to improve the quality of sustainability reporting when implemented substantively. Accordingly, firms that adopt EMS more effectively should have a greater chance of achieving higher ASRRAT categories. Therefore, the first hypothesis is proposed as follows:

H1: Environmental Management System has a positive effect on the Asia Sustainability Reporting Rating (ASRRAT).

Environmental Cost and Asia Sustainability Reporting Rating (ASRRAT)

Environmental Cost refers to expenditures incurred to prevent, identify, and mitigate environmental impacts (Hansen & Mowen, 2005). Although these expenses are monetary, they may also represent a strategic investment that reduces environmental risk and improves corporate reputation (Jasch, 2009). From the perspective of the Legitimacy Theory, transparent disclosure of environmental expenditure constitutes a key indicator of a firm's credibility as it shows that corporate commitment to the environment is supported by actual resource allocation rather than by impression management alone. This is particularly relevant in sustainability reporting, where stakeholders may distinguish between rhetorical commitment and observable organisational sacrifice. Empirical studies generally suggest that environmental expenditure and related green investments can enhance disclosure quality, corporate reputation, and broader sustainability-related outcomes (Diyanti & Sa'diyah, 2024; Dwijayanti & Jayanti, 2024; Romli & Reza Zaputra, 2022; Safitri et al., 2024). However, existing literature on this topic also points out that the measurement of environmental cost varies across firms and is often shaped by accounting treatment, disclosure availability, and reporting practices (Murti, 2022). This explains why empirical findings are not always entirely consistent (Pedron et al., 2021). Nevertheless, firms that allocate and disclose environmental expenditure more transparently are expected to display stronger accountability and thus attain higher ASRRAT categories. Therefore, the second hypothesis is constructed as follows:

H2: Environmental Cost has a positive effect on Asia Sustainability Reporting Rating (ASRRAT).

Foreign Ownership, Environmental Management System, Environmental Cost, and Asia Sustainability Reporting Rating (ASRRAT)

Foreign Ownership may improve the quality of sustainability reporting through stronger external monitoring and greater demands for transparency. From the perspective of the Agency Theory, foreign investors are subject to greater information asymmetry because they are less directly involved in daily management and hence rely more on formal disclosure to assess firm quality, thus motivating them to demand more credible and comparable reporting in accordance with ESG standards. Prior studies have reported that ownership structure influences disclosure behaviour, and foreign investors often encourage better environmental and sustainability-related disclosure practices (Arayssi et al., 2020; Dewi & Honggowati, 2023; Kustinah, 2022). Similarly, recent evidence from Indonesia indicates that Foreign Ownership is positively associated with ESG disclosure and environmental transparency (Wahyuningrum et al., 2025; Wardani et al., 2025). Accordingly, firms with greater Foreign Ownership are expected to achieve higher ASRRAT categories.

In addition to its direct effect on ASRRAT, Foreign Ownership may also strengthen the relationship between EMS and ASRRAT. Notwithstanding its structured and standardised environmental framework, the reporting value of EMS is contingent upon its proper implementation rather than its usage as a purely symbolic certification label. In this respect, foreign investors may act as more vigilant observers, pushing firms to convert EMS into more reliable

disclosure through better documentation, stronger internal controls, and greater audit readiness. When seen in conjunction with Agency Theory and Legitimacy Theory, Foreign Ownership may strengthen the legitimacy value of EMS by increasing pressure for transparency and boosting the visibility of system-based environmental commitment in reporting practices. This is consistent with previous assertions that external governance can bolster the legitimacy of internal environmental commitments (Kustinah, 2022; Nugraheni et al., 2022) and that Foreign Ownership is linked to more rigorous ESG reporting (Wahyuningrum et al., 2025; Wardani et al., 2025). Hence, the positive effect of EMS on ASRRAT is expected to be stronger in firms with higher levels of Foreign Ownership.

Likewise, Foreign Ownership may also moderate the relationship between Environmental Cost and ASRRAT, although this effect is theoretically less definite. In principle, foreign investors may value transparent environmental expenditure since it signals accountability and corporate responsibility. However, unlike EMS, Environmental Cost is not inherently standardised and may vary considerably between firms because of differences in industry characteristics, programme timing, accounting classification, and disclosure practices (Murti, 2022). Consequently, the legitimacy value of environmental expenditure may be more context-dependent and less readily interpretable by external investors. Nonetheless, stronger foreign monitoring may encourage firms to disclose environmental expenditure more clearly and consistently, ultimately improving the quality of sustainability reporting. Accordingly, Foreign Ownership is expected to amplify the positive effect of Environmental Cost on ASRRAT, even though the mechanism is likely to be weaker and more contingent than in the case of EMS. Thus, the third, fourth, and fifth hypotheses are proposed as follows:

H3: Foreign Ownership has a positive effect on the Asia Sustainability Reporting Rating (ASRRAT).

H4: Foreign Ownership strengthens the positive effect of Environmental Management System on the Asia Sustainability Reporting Rating (ASRRAT).

H5: Foreign Ownership strengthens the positive effect of Environmental Cost on the Asia Sustainability Reporting Rating (ASRRAT).

RESEARCH METHODS

This study employed an explanatory quantitative method and used secondary data to examine the causal associations between Environmental Management System, Environmental Cost, Foreign Ownership, and ASRRAT from the perspective of positivist research (Creswell & Creswell, 2023).

Sample and Data Collection

The population comprises all firms participating in the Asia Sustainability Reporting Rating (ASRRAT) during 2018–2024, totalling 125 firms. The sample was selected using purposive sampling based on three criteria: (1) the firm participated in ASRRAT during 2018–2024; (2) it participated consistently throughout the period; and (3) it consistently published annual reports during the same period. Applying these criteria yielded 11 firms, resulting in 77 firm-year observations. Although ASRRAT includes firms from several Asian countries, all sampled firms in this study are Indonesian. This distinction is analytically important because the empirical observations reflect the Indonesian institutional setting within a regional sustainability reporting rating framework.

Secondary data were obtained from annual reports, sustainability reports, and records published by the National Center for Corporate Reporting (NCCR). Publicly accessible corporate reports and supporting literature were reviewed as part of the data collection process. The operational definitions and measurements of all research variables are summarised in Table 1. Environmental Cost is proxied by CSR-related environmental expenditure since it is more commonly reported than detailed environmental cost data. This proxy reflects the firm's relative financial commitment to environmental activities and enables comparability across firms, even though it may not capture all environmental expenditures.

Table 1. Summary of Operational Variables

Type of Variable	Name	Variable Definition	Measurement	Scale
Dependent	ASRRAT	Sustainability reporting quality based on the Asia Sustainability Reporting Rating (ASRRAT)	1 = White, 2 = Bronze, 3 = Silver, 4 = Gold, 5 = Platinum	Ordinal
Independent	Environmental Management System (EMS)	Structured environmental management practices	Natural logarithm of ISO 14001 clauses' scores	Ratio
Independent	Environmental Cost (EC)	The company's relative financial commitment to environmental activities	Natural logarithm of CSR-related environmental expenditure divided by profit after tax	Ratio
Independent / Moderating	Foreign Ownership (FO)	Proportion of company shares owned by foreign investors	Natural logarithm of the percentage of foreign shareholding	Ratio
Interaction	EMSFO	Moderating effect of FO on EMS	EMS × FO	Ratio
Interaction	ECFO	Moderating effect of FO on Environmental Cost	EC × FO	Ratio

Source: Data Processing

Figure 1 presents the conceptual framework of this study based on the theoretical arguments and proposed hypotheses. The model illustrates the direct effects of EMS, Environmental Cost, and Foreign Ownership on ASRRAT, as well as the moderating role of Foreign Ownership in the relationships between EMS, Environmental Cost, and ASRRAT.

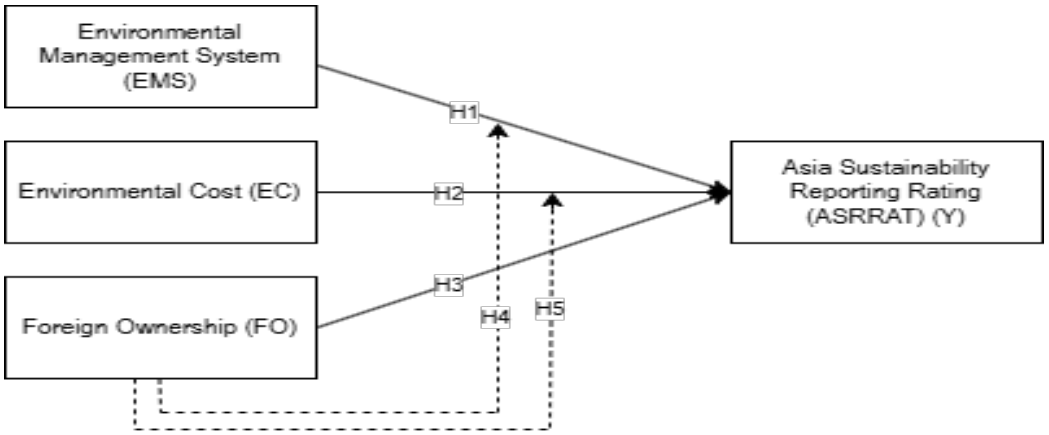

Figure 1. Conceptual Framework

Table 2 shows the distribution of ASRRAT categories to justify the use of ordinal logistic regression. In this study, ASRRAT is measured as an ordered categorical variable. Therefore, it is crucial to demonstrate that the observations are distributed across appropriate ASRRAT ratings (Bronze, Silver, Gold, and Platinum) rather than concentrated in a single category.

Table 2. Distribution of ASRRAT Categories

ASRRAT Category	Code	Frequency	Percentage
Bronze	2	10	13.00%
Silver	3	15	19.50%
Gold	4	33	42.90%
Platinum	5	19	24.70%
Total		77	100.00%

Source: Data Processing

As shown in Table 2, most observations are concentrated in the Gold category (42.9%), followed by Platinum (24.7%), Silver (19.5%), and Bronze (13.0%). This indicates sufficient ordered variation in the dependent variable, supporting the use of ordinal logistic regression since the outcome variable represents ranking differences in sustainability reporting quality.

Data Analysis Technique

The hypotheses were tested using ordinal logistic regression, which is suitable for estimating the effects of EMS, Environmental Cost, and Foreign Ownership on the likelihood of being in a higher ASRRAT category, as well as assessing moderation through the interaction terms EMS×FO and EC×FO. Model adequacy was evaluated through descriptive statistics, multicollinearity testing, Goodness-of-Fit tests, Model Fitting Information, the Test of Parallel Lines, and pseudo-R-squared measures. The cumulative logit model is specified as follows:

$$\text{Logit}[P(ASRRAT \leq j)] = \alpha_j + \beta_1 EMS + \beta_2 EC + \beta_3 FO + \beta_4 (EMS \times FO) + \beta_5 (EC \times FO)$$

Overall, this approach provides empirical evidence on whether EMS and Environmental Cost are associated with higher ASRRAT categories and whether Foreign Ownership strengthens or weakens these relationships.

RESULTS AND DISCUSSION

Descriptive Statistical Analyses

Table 3 displays the descriptive statistics for ASRRAT, Environmental Management System (EMS), Environmental Cost (EC), and Foreign Ownership (FO) based on 77 firm-year observations.

Table 3. Descriptive Statistics of the Study Variables

	N	Min	Max	Mean	Std. Deviation
ASRRAT	77	2.00	5.00	4.1558	0.67013
EMS	77	0.27	0.89	0.5567	0.14383
Environmental Cost	77	0.01	0.98	0.3022	0.27419
Foreign Ownership	77	0.00	0.94	0.1846	0.29028
Valid N (listwise)	77				

Source: IBM SPSS 27 (Data Processing Results, 2025)

ASRRAT has a mean of 4.1558 (SD = 0.6701), indicating that the sampled firms generally achieved relatively high sustainability reporting ratings. EMS shows a mean of 0.5567 (SD = 0.1438), suggesting a relatively consistent level of environmental management application across firms. Environmental Cost has a mean of 0.3022 and a higher standard deviation (0.2742), demonstrating greater variation in environmental expenditure. Similarly, Foreign Ownership is also heterogeneous, with a mean of 0.1846 and values ranging from 0 to 0.94. These descriptive statistics are reported using the original values of EMS, Environmental Cost, and Foreign Ownership, while the regression analyses are described in their log-transformed values.

Model Diagnostic Tests

Before testing the hypotheses, several diagnostic tests were conducted to assess the adequacy of the ordinal logistic regression model. The results are presented in Table 4.

Table 4. Diagnostic Tests of the Ordinal Logistic Regression Model

Test	Statistics	Value	df	Sig.	Conclusion
Multicollinearity	Environmental Management System	Tol = 0.568 VIF = 1.761			
	Environmental Cost	Tol = 0.648 VIF = 1.542			
	Foreign Ownership	Tol = 0.367 VIF = 2.727			No Multicollinearity
	EMS × FO	Tol = 0.522 VIF = 1.916			
	EC × FO	Tol = 0.411 VIF = 2.433			
Test of Parallel Lines	Chi-Square	7.055	10	0.720	Assumption Met
Goodness-of-Fit	Pearson's Chi-Square	206.005	223	0.074	Model Fits Data
	Deviance Chi-Square	197.008	223	0.088	Model Fits Data
Model Fitting Information	-2 Log Likelihood (Intercept)	198.995			
	-2 Log Likelihood (Final)	139.300			
	Chi-Square (Improvement)	59.695	5	<0.001	Significant Model
Pseudo R-Squared	Cox & Snell	0.590			
	Nagelkerke	0.665			66.5% Explained
	McFadden	0.300			

Source: IBM SPSS 27 (Data Processing Results, 2025)

The multicollinearity test results reveal that all predictors and interaction terms have tolerance values greater than 0.10 and VIF values less than 10, indicating no significant multicollinearity. Likewise, the Test of Parallel Lines is also insignificant (p = 0.720), supporting the proportional odds assumption. In addition, the values of both the Pearson test result (p = 0.074) and the Deviance test result (p = 0.088) exceed 0.05, signifying that the model fits the data adequately. The likelihood ratio test further shows that the final model provides a significantly better fit than the intercept-only model ($\chi^2 = 59.695$; $p < 0.001$). Furthermore, the Nagelkerke pseudo-R-squared of 0.665 suggests substantial explanatory power. Overall, these results indicate that the ordinal logistic regression model is appropriate for analysing the determinants of ASRRAT categories.

Ordinal Logistic Regression and Hypothesis Testing Results

The parameter estimates of the ordinal logistic regression model serve as the foundation for hypothesis testing, and the Wald test is used to determine statistical significance. A hypothesis is considered supported when the p-value is below 0.05. Table 5 shows the results of hypothesis testing using the ordinal logistic regression, presenting the direct and interaction effects of the variables.

Table 5. Results of Hypothesis Testing Using Ordinal Logistic Regression

Hypothesis	Relationship Between Variables	Estimates (β)	Wald	Sig.	Decision
H1	Environmental Management System → ASRRAT	1.026	8.284	0.004	Accepted
H2	Environmental Cost → ASRRAT	0.729	7.879	0.005	Accepted
H3	Foreign Ownership → ASRRAT	2.081	7.273	0.007	Accepted
H4	EMS×FO → ASRRAT (Interaction term)	0.462	8.284	0.004	Accepted
H5	EC×FO → ASRRAT (Interaction term)	0.056	0.543	0.461	Rejected

Source: IBM SPSS 27 (Data Processing Results, 2025)

As shown in Table 5, four of the five hypotheses are accepted. EMS, Environmental Cost, and Foreign Ownership all have positive and significant effects on ASRRAT, supporting H1, H2, and H3. Similarly, the interaction term between EMS and Foreign Ownership is also positive and significant, thus H4 is supported. This indicates that Foreign Ownership strengthens the positive effect of EMS on ASRRAT. The interaction term between Environmental Cost and Foreign Ownership, on the other hand, is not significant; therefore, H5 is rejected. In an ordinal logit model, positive coefficients signify a greater likelihood of falling into a higher ASRRAT category.

Overall, these results imply that structured and verifiable environmental systems elicit stronger responses from foreign investors than less standardised spending-based measures.

The Effect of Environmental Management System on the Asia Sustainability Reporting Rating (ASRRAT)

The hypothesis testing results support H1, demonstrating a positive correlation between EMS and higher ASRRAT categories (Wald = 8.284; p = 0.004). This finding confirms the Legitimacy Theory, which holds that firms improve their legitimacy by conforming their business operations to social norms and expectations (Dowling & Pfeffer, 1975; Suchman, 1995). In this context, EMS enhances the credibility of sustainability reporting by providing structured procedures, monitoring routines, and auditable documentation. Firms with stronger EMS implementation appear more capable of substantiating their reporting through verifiable internal systems rather than relying solely on symbolic environmental claims. This interpretation is consistent with studies showing that ISO-based environmental systems improve disclosure quality and sustainability-related outcomes (Joy-Camacho & Thornhill, 2024; Oyelakin & Johl, 2022; Prakoso & Fidiana, 2020; Sam & Song, 2022; Treacy et al., 2019). In addition, it supports the view that more robust environmental objectives and sustainability-oriented disclosures contribute positively to external evaluation outcomes (Helfaya et al., 2023). These findings indicate that ASRRAT rewards not only environmental commitment in principle but also the presence of organisational systems that make such commitment more credible and comparable in practice.

The Effect of Environmental Cost on the Asia Sustainability Reporting Rating (ASRRAT)

According to the hypothesis testing results, H2 is also supported. Environmental Cost is shown to be positively associated with higher ASRRAT categories (Wald = 7.879; p = 0.005), indicating that firms that allocate and disclose environmental expenditure more transparently are more likely to achieve higher sustainability reporting ratings. This finding supports the Legitimacy Theory, which views environmental expenditure as a tangible indicator that environmental commitment is supported by actual resource allocation rather than by narrative disclosure alone. The positive coefficient implies that such expenditure still contributes to perceived accountability when disclosed clearly, although the descriptive statistics indicate significant heterogeneity in Environmental Cost among firms. This finding is consistent with prior studies that link environmental expenditure and related green investments to stronger disclosure quality and corporate reputation (Diyanti & Sa'diyah, 2024; Romli & Reza Zaputra, 2022; Safitri et al., 2024). However, because environmental cost remains a heterogeneous measure that may differ across firms due to disclosure practices and accounting treatment, the findings of this study should be interpreted cautiously (Murti, 2022; Pedron et al., 2021). Nonetheless, the evidence suggests that environmental expenditure retains legitimacy value when disclosed in reporting.

The Effect of Foreign Ownership on the Asia Sustainability Reporting Rating (ASRRAT)

The hypothesis testing results support H3, indicating that Foreign Ownership is positively associated with higher ASRRAT categories (Wald = 7.273; p = 0.007). This finding is consistent with the Agency Theory, which predicts that stronger monitoring reduces information asymmetry and increases demand for credible disclosure (Jensen & Meckling, 1976). In assessing firm quality, foreign investors depend more heavily on formal reporting since they typically face greater information risk and are less directly involved in day-to-day management. Therefore, their presence may push firms to produce more transparent and comparable sustainability reports in accordance with ESG standards. This interpretation is consistent with prior studies associating Foreign Ownership with stronger sustainability disclosure and environmental transparency (Alregab, 2022; Dewi & Honggowati, 2023; Lestari, 2025; Wahyuningrum et al., 2025; Wardani et al., 2025). The finding thus positions Foreign Ownership as an external governance mechanism that directly improves the quality of sustainability reporting.

The Effect of Environmental Management System on the Asia Sustainability Reporting Rating (ASRRAT) moderated by Foreign Ownership

According to the hypothesis testing results, H4 is supported. The interaction term between EMS × Foreign Ownership is positive and significant (Wald = 8.284; p = 0.004), indicating a stronger positive effect of EMS on ASRRAT when Foreign Ownership is higher. This finding suggests that Foreign Ownership does not merely affect reporting quality directly; it also amplifies the reporting value of EMS. From the perspective of the Agency Theory, foreign shareholders act as more vigilant overseers who encourage more substantive EMS implementation through better documentation, internal controls, and audit readiness. According to the Legitimacy Theory, EMS constitutes a credible signal because it is structured and externally recognisable, and foreign monitoring strengthens this signal by putting more pressure for transparency and consistent disclosure. This finding supports the view that external governance can reinforce the credibility of internal environmental commitments (Kustinah, 2022; Nugraheni et al., 2022). Furthermore, it is also consistent with prior studies linking Foreign Ownership to stronger ESG reporting

discipline (Wahyuningrum et al., 2025; Wardani et al., 2025). Accordingly, the findings of this study point to a governance–system complementarity, whereby foreign monitoring enhances the efficacy of EMS as a reporting signal.

The Effect of Environmental Cost on the Asia Sustainability Reporting Rating (ASRRAT) moderated by Foreign Ownership

According to the hypothesis testing results, H5 is not supported. The interaction term Environmental Cost × Foreign Ownership is not significant (p = 0.461), indicating that Foreign Ownership does not significantly strengthen the relationship between Environmental Cost and ASRRAT. This finding is nonetheless theoretically informative, particularly when contrasted with the significant moderation discovered for EMS. This is possibly because Environmental Cost is more heterogeneous and less standardised than EMS. While EMS represents a structured and externally recognisable system, environmental expenditure may differ among firms due to variations in industry characteristics, programme timing, accounting classification, and disclosure practice. Such disparity may reduce comparability and make Environmental Cost a weaker signal for foreign investors who tend to rely on more consistent and auditable indicators when evaluating reporting quality. This interpretation agrees with the literature on environmental cost accounting, which highlights substantial differences in measurement and disclosure across firms (Murti, 2022). Therefore, although environmental expenditure may directly support legitimacy, foreign monitoring appears more likely to strengthen structured, verifiable environmental signals than those that depend more heavily on managerial reporting choices. This finding highlights a crucial boundary condition in the governance role of Foreign Ownership.

Robustness Check

To measure the stability of the study findings, an additional robustness check was performed by re-estimating the ordinal logistic regression model without the interaction terms. This alternative specification is used to examine whether the direct effects remain consistent when the moderation terms are excluded. The results of the robustness check are presented in Table 6.

Table 6. Robustness Check Results

Variable / Diagnostic Test	Robustness Model (Without Moderation)
Environmental Management System (EMS)	β = 17.206; p = 0.002
Environmental Cost (EC)	β = 13.202; p = 0.001
Foreign Ownership (FO)	β = 9.362; p = 0.001
Test of Parallel Lines	p = 0.205
Goodness-of-Fit (Pearson)	p = 0.970
Goodness-of-Fit (Deviance)	p = 1.000
Model Fitting Information	χ^2 = 108.490; p < 0.001
Nagelkerke Pseudo R-Square	0.817

Source: IBM SPSS 27 (Data Processing Results, 2025)

As shown in Table 6, the alternative specification yields qualitatively consistent results: EMS, Environmental Cost, and Foreign Ownership remain positive and significant predictors of higher ASRRAT categories. In addition, the diagnostic results indicate that the model satisfies the proportional odds assumption and fits the data adequately. As an additional sensitivity test, ASRRAT was recoded into a binary outcome distinguishing lower-rated firms (Bronze and Silver) from higher-rated firms (Gold and Platinum), and the model was re-estimated using binary logistic regression. This specification produces broadly consistent results for EMS and Environmental Cost, while the effects of Foreign Ownership and the interaction terms are more sensitive to the simplified outcome structure. Collectively, these additional checks support the robustness of the main direct effects while suggesting that moderation effects are more dependent on the ordinal structure of ASRRAT.

CONCLUSION

This study examines the determinants of ASRRAT categories using 77 firm-year observations and ordinal logistic regression, with particular attention to the moderating role of Foreign Ownership. The results show that Environmental Management System (EMS), Environmental Cost, and Foreign Ownership are positively associated with higher ASRRAT categories. More importantly, Foreign Ownership strengthens the positive effect of EMS on ASRRAT, but does not significantly moderate the relationship between Environmental Cost and ASRRAT. This

suggests that structured and verifiable environmental systems elicit stronger reactions from foreign investors than more heterogeneous spending-based measures.

The study findings contribute to the literature by extending the application of Legitimacy Theory and Agency Theory in the context of sustainability reporting, particularly by showing that external governance strengthens the reporting value of system-based, externally verifiable internal environmental efforts. Internal environmental efforts appear more effective when supported by credible and auditable systems, and Foreign Ownership strengthens the reporting value of these environmental management systems through stronger monitoring and greater transparency demands. Thus, the effectiveness of environmental commitment depends not only on internal implementation but also on the governance framework in which it operates.

Practically, firms aiming for higher ASRRAT categories should prioritise substantive EMS implementation and more transparent disclosure of environmental expenditures. Furthermore, regulators and rating agencies should consider how ownership structure interacts with internal environmental systems in improving the quality of sustainability reporting.

Despite its valuable implications, this study is nevertheless limited by its focus on Indonesian firms participating in ASRRAT and by the use of a CSR-based ratio as a proxy for Environmental Cost. Future studies are recommended to expand research coverage to include more countries, adopt more detailed measures of environmental investment, and examine other governance mechanisms that may affect the quality of sustainability reporting.

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