Jurnal Dinamika Akuntansi dan Bisnis
Vol. 12 (1), 2025, pp 153 – 174

DOI: 10.24815/jdab.v12i1.43670

When Control Backfires: The Double-Edged Role of Management Control Systems in Environmental Capabilities and Environmental Management Accounting Practices

Nilam Kemala Odang [*1] | Indah Murni [2] | Khusnul Afifah Zharaura [3] | Yongky Teguh Setiaji [4]

[1.] *Polytechnic of Wilmar Bisnis Indonesia, Deli Serdang, Indonesia*
[2.3.4.] *Universitas Gadjah Mada, Yogyakarta, Indonesia*

[*]Corresponding author: nilam.odang@wbi.ac.id

Received: 30 December 2024 | **Revised**: 9 June 2025 | **Accepted**: 14 June 2025 | **Published**: 16 June 2025

ABSTRACT

This study examined how environmental management control systems (EMCS) moderate the relationship between environmental capabilities (EC) and the implementation of environmental management accounting (EMA). By integrating EC and EMCS within a unified framework, the analysis draws on data from 900 non-financial Southeast Asian companies reporting ESG metrics from 2019 to 2023. Using ordinal logistic regression, the findings reveal that while EC positively influences EMA implementation, EMCS unexpectedly weakens this effect. This suggests that rigid or misaligned control systems may hinder the effective utilization of environmental capabilities. The study underscores the conditional role of EMCS and highlights the importance of contextually adaptive systems that support, rather than constrain, strategic environmental initiatives. It contributes to the literature by demonstrating how the EC–EMCS interaction can either facilitate or obstruct EMA implementation, particularly within the Southeast Asian context.

Keywords:
Environmental capabilities; environmental management accounting; environmental management control system; environmental performance

Ketika Pengendalian Menghambat: Menelaah Peran Sistem Pengendalian Manajemen dalam Mengarahkan Kapabilitas Lingkungan dan Praktik Akuntansi Lingkungan

ABSTRAK

Studi ini mengkaji bagaimana Environmental Management Control Systems (EMCS) memoderasi hubungan antara Environmental Capabilities (EC) dan Environmental Management Accounting (EMA). Penelitian ini menganalisis data dari 900 perusahaan non-keuangan di Asia Tenggara yang secara konsisten melaporkan metrik ESG pada periode 2019–2023. Menggunakan regresi logistik ordinal, hasil penelitian menunjukkan bahwa EC berpengaruh positif terhadap penerapan EMA. Namun, EMCS justru melemahkan pengaruh tersebut. Hal ini mengindikasikan bahwa sistem pengendalian yang kaku atau tidak selaras dapat menghambat pemanfaatan kapabilitas lingkungan secara efektif. Studi ini menekankan pentingnya sistem pengendalian yang adaptif terhadap konteks, yang mendukung inisiatif strategis lingkungan.

Citation:
Odang, N. K., Murni, I., Zharaura, K. A., Setiaji, Y. T. (2025). When Control Backfires: The Double-Edged Role of Management Control Systems in Environmental Capabilities and Environmental Management Accounting Practices . *Jurnal Dinamika Akuntansi dan Bisnis, 12(1), 153 – 174*

1. Introduction

Environmental management accounting (EMA) has emerged as a critical innovation in supporting sustainable development goals by providing relevant environmental decision-making information (Christ & Burritt, 2013; CIMA, 2019; Debnath et al., 2011; Ferreira et al., 2010; Schaltegger et al., 2006). EMA helps organizations identify, measure, and manage environmental costs. This, in turn, reduces environmental impacts and improves resource efficiency (Chaudhry & Amir, 2020; Gunarathne et al., 2023). Burritt et al. (2002) distinguish between two key dimensions of EMA: monetary environmental management accounting (MEMA) and physical environmental management accounting (PEMA), both of which support decision-making and control functions contributing to enhanced environmental performance. Both types of EMA support decision-making and control functions, which ultimately contribute to improved environmental performance (Burritt et al., 2023; Latan et al., 2018; Lee & Schaltegger, 2018).

Grounded in the Natural Resource-Based View (NRBV), a firm's internal capabilities, particularly environmental capabilities (EC), are crucial for translating environmental strategies into superior performance (Hart, 1995; Mady, Battour, et al., 2023). EC reflects organizational knowledge, skills, and resources that enable firms to integrate environmental considerations into strategic and operational decision-making processes (Walls et al., 2011). Firms with strong EC are better able to respond to environmental pressures but are also more capable of adopting sustainability-oriented innovations (Demirel & Kesidou, 2019) and achieving competitive advantage (Tarifa-Fernández et al., 2023; Wong & Ngai, 2021). This capability plays a critical role in enabling firms to implement EMA more effectively, thereby strengthening their environmental performance and supporting long-term sustainability (Wang et al., 2019).

However, the process of applying EC in strategic contexts is not automatic. This requires mechanisms that help align capabilities with the specific demands of the business environment (Mishra & Yadav, 2021). EC supports firms in achieving higher environmental performance, which in turn enhances the quality of EMA implementation. In Southeast Asia, where institutional pressures related to sustainability are intensifying but regulatory enforcement remains heterogeneous, EC functions as a vital internal response mechanism to navigate complex external demands. It enables firms to identify areas for improvement, set measurable targets, and effectively monitor progress (Ong et al., 2022). Despite the growing interest in EC and EMA, how EC drives EMA implementation remains underexplored. Recent studies suggest that internal control systems—particularly environmental management control systems (EMCS)—may serve as enabling factors in this relationship (Pondeville et al., 2013; Solovida & Latan, 2017).

EMA is increasingly viewed as a core component of EMCS, serving as a mechanism to help firms strengthen their competitive positioning. However, as emphasized by Amores-Salvadó et al. (2015), EMCS cannot work in isolation. Its effectiveness depends on how well it is integrated with the firm’s existing resources and capabilities, ensuring that sustainability efforts are both actionable and measurable. EMCS typically comprises formal and informal tools—such as strategic planning systems, environmental performance evaluations, and incentive mechanisms—

that are designed to monitor, manage, and improve environmental practices continuously (Amores-Salvadó et al., 2015). When implemented effectively, EMCS helps align environmental goals with broader organizational objectives, reinforces accountability, and supports evidence-based decision making (Bresciani et al., 2023; Rehman et al., 2021).

The role of EMCS as a moderating mechanism in the EC–EMA relationship has not been sufficiently investigated, particularly in the context of emerging economies. While previous studies have examined EC, EMA, and EMCS as separate constructs, very few have integrated them within a single analytical framework. Moreover, recent literature urges researchers to explore not only the antecedents or enablers of EMA adoption but also how interaction effects, such as moderation, shape this process (Deb et al., 2023; Gerged et al., 2024). In addition, many existing studies are cross-sectional, offering only a snapshot of organizational practices. A longitudinal perspective is required to capture the dynamic influence of EC and EMCS on EMA implementation over time.

Existing literature on EC, EMA, and EMCS has primarily relied on cross-sectional data, providing only a static view of environmental practices. Moreover, many studies have treated these constructs in isolation, without integrating them into a cohesive analytical framework. There is a lack of research capturing the dynamic influence of EC and EMCS over time and examining how variations in EMCS design may enhance or inhibit EMA implementation. Based on the explanation above, the research questions that can be asked include (1) is EC positively associated with EMA implementation? and (2) is the positive association between EC and EMA strengthened by EMCS? Unlike prior studies that have examined EC, EMA, or EMCS in isolation, this study integrates all three into a single analytical framework grounded in the NRBV, offering a more holistic understanding of how environmental capabilities are translated into concrete accounting practices. This study extends EMA literature by identifying the conditions under which EMCS strengthens the influence of EC, particularly in emerging economies. The findings aim to provide empirical evidence on the antecedents and enabling conditions of EMA adoption, support strategic alignment toward sustainability goals, and inform the design of effective EMCS to improve environmental performance.

2. Theoretical framework and hypotheses development

Stakeholder theory (Freeman, 2010) asserts that stakeholders are individuals or groups that can affect or be affected by the achievement of an organization's objectives. In today's business environment, corporate goals extend beyond profit generation to include sustainable value creation for a wide range of stakeholders. This theory emphasizes that companies are not isolated economic actors but are embedded within a broader social system, thus obligated to generate positive impacts for stakeholders (Andrian & Yvonne, 2021). Stakeholders, such as regulators, consumers, and communities, increasingly demand environmentally responsible practices. Consequently, companies are driven to enhance their environmental performance to meet these expectations. Stakeholder pressure has been shown to influence the implementation of environmental strategies

and reporting practices (Solovida & Latan, 2017), making stakeholder theory particularly relevant to understanding how companies develop EC and apply EMA.

In parallel, legitimacy theory (Dowling & Pfeffer, 1975; O'Donovan, 2002) offers an explanation of corporate behaviour through the lens of social approval. Companies seek legitimacy by aligning their practices with socially accepted norms and values. This perspective is essential in understanding why companies adopt environmental management practices and disclose environmental information – to maintain societal approval and avoid legitimacy threats. For instance, aligning environmental performance with social norms can secure operational continuity and reputational capital. Hence, legitimacy theory helps explain why companies institutionalize EC and internal control systems such as EMCS and EMA as tools to achieve both environmental legitimacy and performance (Nkundabanyanga et al., 2021). Taken together, stakeholder and legitimacy theory provide a comprehensive lens to understand how companies respond to environmental demands, justify their internal strategies, and shape their environmental outcomes.

Whereas stakeholder and legitimacy theories explain external pressures, the NRBV is adopted as the core framework to explore how firms internally develop and leverage EC, EMA, and EMCS as strategic resources. NRBV emphasizes how internal capabilities can become valuable, rare, and inimitable strategic resources that enhance a firm's sustainable performance. Stakeholder and legitimacy theories serve as complementary frameworks, contextualizing how external legitimacy and stakeholder pressures drive firms to build and utilize these capabilities. By integrating these theories, the study builds a multi-layered understanding of how environmental capabilities are developed, managed, and transformed into actionable strategies through accounting and control systems.

Environmental capabilities and environmental management accounting

EC refers to an organization's ability to minimize environmental harm through its operations while managing environmental resources in alignment with strategic goals (Hart, 1995; Walls et al., 2011). These capabilities include managerial vision, human resource skills, top management support, and organizational learning (Burritt et al., 2002; Franco et al., 2024). According to stakeholder theory, EC can be seen as a strategic response to the demands and pressures from stakeholders, especially those concerned with environmental sustainability. Stakeholders expect firms to develop proactive capabilities that minimize environmental damage, and firms with stronger EC are better positioned to meet these expectations (Albertini, 2021).

From the NRBV standpoint, EC represents a core strategic resource that can facilitate the adoption of EMA. EMA involves the identification, collection, and analysis of physical and monetary environmental information to support decision-making (Burritt et al., 2002). Firms with well-developed EC are more likely to have the knowledge, systems, and processes needed to collect and utilize environmental data – thus, improving the effectiveness of EMA. Conversely, the implementation of EMA itself can further develop EC by institutionalizing best practices in

environmental cost tracking, resource efficiency, and pollution control (Deb et al., 2023; Johri et al., 2024). This two-way relationship suggests a reinforcing dynamic between EC and EMA.

From the legitimacy theory viewpoint, implementing EMA supports companies in legitimizing their environmental performance through structured disclosures and transparent reporting. As companies develop EC, they are more likely to formalize their environmental accounting processes to meet external legitimacy requirements and stakeholder expectations. Without adequate EC, companies are likely to struggle in adopting EMA effectively (Mady et al., 2023).

Although prior studies such as Deb et al. (2023) and Gerged et al. (2024) emphasize the positive impact of EMA on corporate performance, emerging evidence highlights a reciprocal relationship in which strong EC facilitate the effective adoption of EMA (Johri et al., 2024), as companies with developed EC are better positioned to institutionalize EMA practices. Johri et al. (2024) found that sustainable management accounting (SMA) implemented by companies can improve sustainable corporate governance (SCG) so that it will strengthen the company's environmental performance. In addition, Sawe et al. (2021) have also previously stated that a company's environmental performance is determined by EC because it facilitates companies in achieving higher levels of environmental performance. Moreover, EC reflects the underlying skills, competencies, and knowledge that support the effective implementation of EMA (Mady et al., 2023; Nkrumah et al., 2021). Baranova & Meadows (2017) stated that companies that do not have EC will tend to fail to implement regulations, which will have an impact on the implementation of EMA.

In summary, the relationship between EC and EMA can be explained through a multi-theoretical lens: stakeholder theory justifies the pressure-driven development of EC, NRBV positions EC as a key internal capability that enables EMA, and legitimacy theory explains how EMA practices help firms legitimize their environmental performance. These theoretical perspectives collectively support the hypothesis that EC is positively associated with EMA.

H_1: Environmental capabilities are positively associated with the implementation of environmental management accounting.

Environmental management control system

EMCS are formalized mechanisms used to guide and monitor environmental performance. EMCS includes systems, procedures, and processes that help managers make decisions aligned with environmental goals (Guenther et al., 2016). Drawing from stakeholder theory, companies implement EMCS to respond to stakeholder demands for environmental accountability and performance improvements. Stakeholders not only expect compliance but also continuous improvement in environmental outcomes, which necessitates structured control systems (Waxin et al., 2023).

Legitimacy theory also supports the adoption of EMCS as a tool to demonstrate alignment with societal expectations. Through EMCS, firms can institutionalize practices that reflect societal values on sustainability and thereby maintain their legitimacy (Petera et al., 2021). For instance, EMCS helps companies demonstrate compliance with ISO 14001 and other environmental standards, which are often seen as proxies for legitimate environmental behaviour.

More importantly, under the NRBV framework, EMCS can be interpreted as a capability-enhancing mechanism that helps transform environmental capabilities into concrete outcomes by enabling firms to track, measure, and manage environmental data efficiently (Franco et al., 2024). EMCS plays a moderating role in this process by facilitating the integration of EC and EMA. For instance, companies with strong EC may not be able to fully capitalize on their capabilities unless they are supported by robust EMCS structures. EMCS provides the necessary infrastructure to channel EC into measurable practices supported by EMA (Antonini & Gomez-Conde, 2024; Waxin et al., 2023). It ensures that the environmental information generated through EMA is utilized strategically, thereby strengthening the relationship between EC and EMA.

Although empirical research on EMCS as a moderator is still developing, recent studies consistently highlight its crucial role in enhancing the synergy between EC and EMA (Antonini & Gomez-Conde, 2024; Franco et al., 2024; Huang & Xiao, 2023; Waxin et al., 2023). The inclusion of EMCS as a moderator in this study is not only grounded in empirical findings but also justified theoretically through NRBV, stakeholder, and legitimacy theories. EMCS bridges internal EC with accounting systems that inform and shape corporate responses to external expectations.

Huang & Xiao (2023) found that environmental management system (EMS) as a reflection of environmental management capability fully mediates the relationship between capability and environmental innovation. In addition, Waxin et al. (2023) showed that EMCS drives better adoption and implementation of EMA practices with more significant results on corporate environmental performance. Franco et al. (2024) found that companies with strong EMCS are able to effectively manage EC, resulting in improvements in the company's environmental and financial performance. In addition, Antonini & Gomez-Conde (2024) found that EMCS is positively related to environmental innovation. Taken together, prior studies suggest that EMCS strengthens the EC–EMA linkage by institutionalizing environmental information flows and ensuring this information is systematically utilized in decision-making. In this sense, EMCS functions as a conduit through which EC can be transformed into structured EMA practices. A good control system allows companies to not only better identify and analyze environmental data, but also translate the data into actions that support better EC. Thus, it is expected that the company's EC strengthened by EMA and supported by EMCS will produce better environmental performance.

Collectively, these findings imply that EMCS functions as an enabling mechanism that operationalizes EC through structured accounting processes (Franco et al., 2024). By providing decision-making tools and oversight mechanisms, EMCS ensures that EC is not only identified but also strategically leveraged through EMA (Waxin et al., 2023). Hence, EMCS is expected to moderate the relationship between EC and EMA, enhancing the effectiveness of both.

H_2: Environmental management control systems moderate the positive association between environmental capabilities and the implementation of environmental management accounting.

3. Research method

This study uses archival data of Southeast Asian companies obtained from Thomson Reuters' Datastream from 2019-2023. The focus on Southeast Asia is justified by the region's growing relevance in global environmental governance, coupled with the institutional complexity and variability in environmental regulation enforcement. These conditions provide a rich context to examine the interaction between internal capabilities and environmental management systems (Acharyya, 2022). Moreover, Southeast Asia has become a focal point for global investment and supply chain relocation, intensifying the environmental responsibilities of companies operating in the region. Despite regulatory and institutional differences among member countries, there has been a steady rise in the adoption of Environmental, Social, and Governance (ESG) disclosures, making the region both challenging and important for understanding how environmental capabilities and control systems translate into environmental accounting practices.

In Thomson Reuters' Datastream, there are 4,210 public companies in Southeast Asia. The criteria for companies used as samples include (1) public companies in Southeast Asia that report (ESG); (2) are not financial sector companies; and (3) have available data on proxies for the variables studied. Based on the results of purposive sampling, the number of companies registered during the observation year was 180 companies so that the observation data for five years amounted to 900 companies. The measurement of variables is shown below in Table 1.

Table 1. Variable Measurements

Variables		Measurements	References
Environmental Capabilities (Independent)			
Environmental Capabilities	Historical orientation	0: 0 years 1: 1-10 years 2: 11 – 20 years 3: 21 – 30 years 4: > 30 years	Walls et al. (2008)
	Network Embeddedness	0: No network embeddedness in the supply chain or among stakeholders 1: Network embeddedness exists in the supply chain or among stakeholders	
	Endowment	0: $0 - $399 million 1: $400 million - $1,6 billion 2: > $1,6 billion	
	Managerial vision	0: none 1: Statement created 2: Vision for five years or more	
	Top management team skills	0: not available 1: local/ facility level 2: Senior management team 3: Board or external auditors	

Variables		Measurements	References
	Human Resources Skills	0: does not use GRI 1: uses GRI	
Environmental Management Control System (Moderating)			
Environmental Management Control System	Environmental Orientation	0: Not available 1: Company explicitly states commitment to environmental protection in annual or sustainability reports	Hennig et al. (2023)
	Environmental Metric Adoption	0: Not available 1: The company adopts at least one environmental metric (e.g., carbon dioxide (CO_2) emissions, energy and water consumption, or waste production)	
	Target Setting	0: Not available 1: One or more targets are set for the company's environmental metrics	
	Compensation Linking	0: Not available 1: Environmental metrics are integrated into the organization's remuneration system	
Environmental Management Accounting (Dependent)			
Environmental Management Accounting	Monetary Environmental Management Accounting (MEMA)	0: None 1: Costs related to environmental expenditures exist	Burritt et al. (2002); Ferreira et al. (2010); Schaltegger, (2003)
		0: None 1: Fines for violating environmental laws or regulations	
		0: None 1: Lawsuits by stakeholders due to pollution	
		0: None 1: Cost savings from focusing on environmental preservation	
	Physical Environmental Management Accounting (PEMA)	0: None 1: Company conducts environmental impact analysis	
		0: None 1: Use of decision-supporting techniques related to environmental preservation	
		0: None 1: Measurement tools are used to assess eco-efficiency	
		0: None 1: Tools are used to manage environmental consequences of business activities, directly or indirectly	
		0: None 1: Company has facilities to communicate environmental preservation internally and externally	
		0: None 1: Production processes result inMenvironmentally friendly products	

Variables	Measurements	References
Control Variables		
Company size	Natural logarithm of total assets	Gerged et al. (2024)
Company Age	Natural logarithm of the company's age since establishment	Gerged et al. (2024); Gupta & Batra (2016)
CEO Education Level	1 = High School 2 = Associate Degree 3 = Bachelor's Degree 4 = Master's Degree 5 = Doctorate	Gerged et al. (2024)
Country-fixed effect	0: Developing country 1: Developed country	Derchi et al. (2023)
Industry-fixed effect	0: High-technology industry 1: Non-technology industry	Gerged et al. (2024)
Year-fixed effect	0: Year of the COVID-19 pandemic 1: Year without the COVID-19 pandemic	Derchi et al. (2023)

Data analysis techniques were performed using ordinal logistic regression analysis. In this study, the dependent variable uses non-metric data so that the assumption of multivariate normal distribution cannot be met. This causes a change in function to logistic and does not require the assumption of data normality in its independent variables. Hypothesis testing is performed using the following model estimates:

$$EMA_{it} = \alpha + \beta_1 EC_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 EDU_{it} + \beta_5 COU_i + \beta_6 IND_i + \beta_7 YEAR_t + \varepsilon_{it} \quad (1)$$

$$EMA_{it} = \alpha + \beta_1 EC_{it} + \beta_2 EMCS_{it} + \beta_3 EMA*EMCS_{it} + \beta_4 SIZE_{it} + \beta_5 AGE_{it} + \beta_6 EDU_{it} + \beta_7 COU_i + \beta_8 IND_i + \beta_9 YEAR_t + \varepsilon_{it} \quad (2)$$

where:

α	= Constant
β	= Coefficient
EC	= Environmental Capabilities
EMA	= Environmental Management Accounting
EMCS	= Environmental Management Control System
SIZE	= Company Size
AGE	= Company Age
EDU	= CEO Education Level
TEAM	= Environmental Management Team
COUNTRY	= Country-fixed Effect
INDUSTRY	= Industry-fixed Effect
YEAR	= Year-fixed Effect
ε	= error
i	= firms
t	= period

4. Results and discussion

Descriptive statistics

Table 2 presents descriptive statistics of the main variables and control variables in this study. Panel A shows the distribution of firms across six Southeast Asian countries included in the sample. Thailand contributes the largest proportion of firms (29.44%), followed by Singapore (23.33%) and Indonesia (18.33%). Vietnam has the fewest firms in the sample, representing only 0.56%.

Panel B presents the industry distribution of firms that regularly disclose ESG information in the Thomson Reuters database. The sample includes 10 industrial sectors. The consumer staples sector represents the highest proportion (20.00%), while information technology is the sector with the least participation in reporting ESG to Thomson Reuters' (3.33%). This distribution indicates varying levels of ESG reporting engagement across industries.

Panel C provides descriptive statistics for the main research and control variables. The mean value of EC is 7.58, with a standard deviation (SD) of 2.33, suggesting a moderate level of capability across firms. The average score for the EMCS is 2.80 (SD = 0.80), while EMA has a mean of 5.42 (SD = 2.12). The interaction term (EC × EMCS) has a mean of 21.63 and a relatively high SD of 10.04, reflecting greater variability in the combined effect.

Regarding control variables, the average firm size is 21.89 (SD = 1.28), and the average firm age is 3.49 (SD = 0.69). The average CEO educational level is 3.58 (SD = 0.81), indicating a relatively high level of education among top executives. Dummy variables for country, industry, and year-fixed effects have means of 0.23, 0.24, and 0.40, respectively, with standard deviations consistent with binary coding. In general, all variables exhibit good data dispersion, as indicated by the means being greater than their respective standard deviations, suggesting no serious issues of data clustering or skewness.

Tabel 2. Descriptive statistics

Panel A: Descriptive Statistics by Country		
Country	N	%
Indonesia	165	18.33
Malaysia	160	17.78
Singapura	210	23.33
Thailand	265	29.44
Filipina	95	10.56
Vietnam	5	0.56
Total	900	100
Panel B: Descriptive Statistics by Industry		
Industry	N	%

Communication Services	100	11.11
Consumer Discretionary	40	4.44
Consumer Staples	180	20.00
Energy	55	6.11
Health Care	45	5.00
Industrials	120	13.33
Information Technology	30	3.33
Materials	65	7.22
Real Estate	160	17.78
Utilities	105	11.67
Total	900	100

Panel C: Descriptive Statistics by Research Variables

	N	Min	Max	Mean	SD
Environmental Capabilities	900	0.00	13.00	7.58	2.33
Environmental Management Control System	900	0.00	4.00	2.80	0.80
EC*EMCS	900	0.00	52.00	21.63	10.04
Environmental Management Accounting	900	0.00	10.00	5.42	2.12
Firm Size	900	16.90	25.33	21.89	1.28
Firm Age	900	0.69	5.24	3.49	0.69
CEO Educational Level	900	0.00	5.00	3.58	0.81
Country-fixed Effect	900	0.00	1.00	0.23	0.42
Industry-fixed Effect	900	1.00	1.00	0.24	0.43
Year-fixed effect	900	0.00	1.00	0.40	0.49

Correlation Analysis

Table 3 presents the Pearson correlation coefficients among the main and control variables, alongside Tolerance and Variance Inflation Factor (VIF) values to assess potential multicollinearity issues. As shown in the table, EC and EMCS are positively correlated ($r = 0.218$, $p < 0.01$), suggesting a modest linear relationship between the two constructs. EC also demonstrates a significant positive correlation with EMA ($r = 0.148$, $p < 0.01$), while EDU is similarly associated with EMA ($r = 0.142$, $p < 0.01$). In contrast, IND are negatively associated with EMA ($r = -0.114$, $p < 0.01$), which may reflect differences in environmental accounting practices across industries.

The interaction term EC × EMCS shows weak and statistically insignificant correlations with its constituent variables (EC: $r = -0.021$; EMCS: $r = 0.032$). This result is anticipated because both EC and EMCS were mean-centered prior to constructing the interaction term. The low correlation values between the interaction term and its components support the effectiveness of this technique in isolating the moderating effect of EMCS on the relationship between EC and EMA.

Further evidence of the absence of multicollinearity is provided by the VIF and Tolerance statistics. All VIF values fall well below the conventional threshold of 10, with the highest VIF being 1.181 (for industry-fixed effects), and all Tolerance values exceed 0.1. Specifically, the VIF values for EC (1.064), EMCS (1.099), and EC × EMCS (1.028) are all close to 1.000, indicating negligible multicollinearity. Similarly, the control variables, including firm size, firm age, and CEO educational level, also show VIF values in an acceptable range (between 1.073 and 1.167). Overall, the correlation analysis confirms that the variables included in this study are statistically

suitable for multivariate analysis. The absence of multicollinearity ensures the robustness of the subsequent regression models used to test the study's hypotheses.

Table 3. Pearson Correlation

Variables	EMA	EC	EMCS	EC* EMCS	SIZE	AGE	EDU	COU	IND	YEAR	Tole-rance	VIF
EMA	1											
EC	0.148**	1									0.940	1.064
EMCS	0.009	0.218**	1								0.910	1.099
EC*EMCS	-0.071*	-0.021	0.032	1							0.973	1.028
SIZE	-0.062	0.022	0.158**	0.007	1						0.857	1.167
AGE	0.016	0.126**	0.167**	-0.003	0.148**	1					0.870	1.149
EDU	0.142**	-0.011	-0.011	0.039	-0.061	-0.051	1				0.930	1.076
COU	0.015	-0.022	-0.020	-0.064	0.110**	-0.189**	-0.079*	1			0.932	1.073
IND	-0.114**	-0.023	0.022	0.035	-0.242**	0.159**	-0.217**	-0.039	1		0.847	1.181
YEAR	0.038	0.011	0.005	0.131**	-0.011	-0.003	0.000	0.000	0.000	1	0.982	1.019

Note: N = 900. ** and * indicate that significance is at the 1% and 5% levels.

Discussion

The results of the hypothesis testing for the main variables – EC, EMCS, and EMA – along with relevant control variables, are summarized in Table 4. In this analysis, EMA is treated as the dependent variable. Model 1 includes the independent variables and control variables only, while Model 2 further incorporates EMCS as a moderating variable, along with its interaction terms with the independent variables.

Table 4. Hypothesis Testing

Model	1	2
Dependent Variables	EMA	EMA
EC	0.108***	0.108***
	17.902	17.251
EMCS		-0.015
		0.040
EC*EMCS		-0.074**
		5.500
SIZE	-0.125***	-0.117**
	6.570	5.585
AGE	0.121	0.116
	1.764	1.613
EDU	0.272***	0.282***
	13.263	14.163
COU	Yes	Yes
IND	Yes	Yes
YEAR	Yes	Yes
Chi-square model	48.508***	53.914**
Pseudo r-squared	0.053	0.059
N	900	900

Note: Both models use ordinal logistic regression. Both models also include country, industry, and year-fixed effects. ***, **, and * indicate significance at the 0%, 1%, and 5% levels.

The study sample consists of 900 observations. Statistical tests reveal that the chi-square values for both models are highly significant (p = 0.000), indicating that the overall regression models reliably explain variations in EMA. This suggests that the included independent and control variables collectively have a statistically significant impact on EMA implementation. However, pseudo R-squared values of 0.053 (Model 1) and 0.059 (Model 2) indicate that while the models explain a modest proportion of the variance in EMA, there remains substantial unexplained variability.

Environmental capabilities and environmental management accounting

Model 1 shows a significant positive association between EC and EMA (β = 0.108, p = 0.00), thus supporting H_1. This finding aligns with the NRBV, which posits that firms gain competitive advantage through valuable, rare, and inimitable resources (Hart & Dowell, 2011). EC, as an intangible and strategic resource, empowers firms to proactively respond to environmental challenges and embed sustainability into core decision-making processes (Scarpellini et al., 2020). While the ordinal logistic regression models used in this study yield statistically significant results, the pseudo R-squared values remain relatively low (approximately 5–6%). This is not uncommon in social science research, particularly when using logistic regression models with complex constructs and ordinal dependent variables. Low pseudo R-squared values may reflect the inherent variability in organizational behaviour, especially in diverse institutional contexts like Southeast Asia. Furthermore, the use of archival ESG data, which may not fully capture the depth and nuance of internal management practices, can contribute to unexplained variance. Nevertheless, the significant coefficients and robustness of control variables provide confidence in the direction and reliability of the hypothesized relationships. Future studies may incorporate qualitative insights or more granular firm-level data to improve model explanatory power.

EC enables significant cost savings by reducing waste, improving energy efficiency, and minimizing pollution. These capabilities are not only essential for controlling environmental impact without compromising profitability but also for enhancing firm reputation and achieving product and service differentiation in increasingly green-conscious markets (Khan et al., 2023). Moreover, EC can elevate a company's visibility and credibility among environmentally conscious consumers and stakeholders.

In this context, companies with higher EC tend to be more aware of the value of EMA implementation. EMA serves as a strategic tool to measure, track, and manage environmental costs effectively, thereby uncovering hidden opportunities for efficiency, innovation, and risk mitigation (Burritt et al., 2002; Ferreira et al., 2010; Schaltegger et al., 2006). Through its integration, EMA supports environmental decision-making, improves internal transparency, and enhances accountability—especially important in managing public perception and meeting stakeholder expectations (Afiah et al., 2024; Al-Mawali et al., 2018).

The positive relationship between EC and EMA is particularly salient in Southeast Asian countries such as Thailand and Vietnam, where institutional pressures have intensified due to

global sustainability mandates. Thailand's "BCG Economy" model and Vietnam's commitments under the Paris Agreement have encouraged firms to internalize environmental concerns as a strategic necessity (Donovan et al., 2016; Nguyen et al., 2019). Institutional theory (DiMaggio & Powell, 1983) helps explain how companies respond not only to coercive pressures (regulations), but also to normative (industry standards) and mimetic (peer behavior) pressures (Jamali et al., 2017).

Firms integrated into global value chains are increasingly scrutinized by international buyers and partners, compelling them to demonstrate environmental compliance and performance. In this scenario, EC plays a dual role: as a foundation for environmental innovation and as a strategic response to institutional demands for transparency (Saeed et al., 2018). Consequently, EMA becomes a mechanism through which companies institutionalize their EC, enabling them to meet both internal strategic goals and external legitimacy requirements (Odang & Sinambela, 2025).

This study also suggests that developing EC can enhance environmental performance without undermining financial sustainability. Firms that invest in EC can harness synergies across functional units and build relationships with internal and external stakeholders (Odang et al., 2025; Simbolon & Odang, 2024), thus reinforcing their strategic position (Mayndarto & Agustine, 2021). Moreover, EC can serve as a trigger for modifying the management accounting system to incorporate continuous environmental monitoring and uncertainty reduction. Ultimately, EMA becomes a manifestation of how EC drives sustainability-oriented decision-making and organizational learning (Khomsiyah et al., 2023; Solovida & Latan, 2017).

Moderating role of environmental management control system

Model 2 introduces the interaction term between EC and EMCS, which is significant and negative ($\beta = -0.074$, $p < 0.05$), thus rejecting H_2. Contrary to the hypothesized positive moderating effect, this result suggests that EMCS may, in some cases, dampen the positive effect of EC on EMA implementation. This finding invites a deeper analytical interpretation.

From a contingency theory perspective, management control systems (MCS) are only effective when aligned with contextual and organizational factors. In Southeast Asian contexts, such as Thailand and Vietnam, the implementation of EMCS may still be in a developmental phase, often characterized by rigid procedures or inadequate alignment with strategic environmental goals (Donovan et al., 2016; Nguyen et al., 2019). Rather than enabling flexibility and innovation, EMCS may act as a constraint on proactive environmental behavior, especially when they emphasize regulatory compliance over organizational learning and adaptability (Einhorn et al., 2024).

Alternatively, this interaction effect may reflect a substitution effect rather than a complementary one. Firms with strong EC may already possess sufficient internal capabilities and motivation to implement EMA without relying heavily on EMCS (Ong et al., 2019). In such cases, overly formalized or bureaucratic EMCS may hinder innovation and responsiveness—two traits

that are critical for successful EMA implementation (Einhorn et al., 2024; Perego & Hartmann, 2009).

This finding also aligns with the institutional realities in developing economies. Although environmental regulation is improving in Thailand and Vietnam, enforcement remains uneven, and many firms perceive EMCS more as tools for external reporting than as mechanisms for internal strategic learning. Institutional voids—such as the absence of robust professional bodies and fragmented environmental governance—can lead to symbolic or superficial adoption of EMCS, thereby reducing their ability to enhance EC-EMA linkages (Alnaim & Metwally, 2024).

To improve this dynamic, firms need to move beyond compliance-focused EMCS toward systems that support environmental learning, cross-functional collaboration, and innovation (Lozano, 2012). Achieving this requires capacity building, training, and aligning EMCS with broader environmental and strategic goals (Hennig et al., 2023). In practice, this could include customizing EMCS to fit local organizational culture, environmental priorities, and maturity levels, especially in the context of emerging Southeast Asian economies.

5. Conclusions, limitations, and recommendations

This study set out to examine how EC influence the implementation of EMA in non-financial firms across Southeast Asia, and whether EMCS play a moderating role in that relationship. The results revealed a clear, positive link between EC and EMA – suggesting that firms with stronger EC are more likely to implement robust EMA practices. Interestingly, the moderating role of EMCS turned out to be negative and significant. This indicates that in certain contexts, EMCS may actually limit rather than support the strategic potential of EC – especially when these systems are overly rigid or misaligned with the realities of the organization.

These findings yield several theoretical and practical implications. Theoretically, this study extends institutional and contingency theory by showing that EMCS may act as either an enabler or inhibitor of strategic environmental initiatives, depending on how they are designed and embedded within firms (Hennig et al., 2023). It also affirms stakeholder and legitimacy theory, highlighting the role of strong EC and transparent environmental actions in building public trust and meeting stakeholder expectations (Baranova, 2022; Wicaksono, 2024).

Practically, this study offers a message to business leaders: EMCS should not just be about checking compliance boxes. Instead, EMCS should be designed to promote learning, collaboration, and adaptability across departments. When firms align EMCS with their internal culture and strategic goals, and pair them with strong EC, the benefits for both environmental and business performance can be substantial (Barros & Ferreira, 2022).

From a policy perspective, the findings suggest that governments in Southeast Asia have an important role to play – not only in mandating environmental disclosures but also in supporting companies to build the internal systems and capacities needed to manage environmental issues proactively. Public pressure and civil society engagement can help push this agenda forward,

encouraging companies and policymakers alike to invest in more meaningful, sustainable practices.

Despite the insights provided, this study has several limitations. First, it relies on secondary data derived from corporate disclosures available in the Thomson Reuters database. Such disclosures are often voluntary and may reflect selective transparency rather than comprehensive reporting. Second, the study includes only companies that report environmental performance, which may skew the results toward more environmentally engaged firms. While the data are credible, future research could be strengthened by integrating additional sources – like sustainability reports, independent assessments, or even media coverage – to provide a broader context.

Future research could also explore the role of top management commitment and strategic orientation toward sustainability, as leadership attitudes significantly influence how environmental control systems are designed and enacted. Additionally, qualitative approaches could offer a more nuanced understanding of how EMCS function across different organizational settings and cultural contexts. Expanding the scope to include diverse institutional environments will further enhance understanding of how environmental capabilities are developed and translated into effective management practices across industries and regions.

References

Acharyya, A. (2022). *Environmental economics in developing countries: Issues and challenges* (1st ed.). Routledge India. https://doi.org/10.4324/9781003253884

Afiah, E. T., Meutia, Bastian, E., & Retnowati, W. (2024). Conceptual environmental sustainable development through environmental management accounting practices. *International Journal of Environmental Impacts*, *7*(4), 623–632. https://doi.org/10.18280/ijei.070403

Al-Mawali, H., Sharif, A. Al, Rumman, G. A., & Kerzan, F. (2018). Environmental strategy, environmental management accounting and organizational performance: Evidence from the United Arab Emirates market. *Journal of Environmental Accounting and Management*, *6*(2), 105–114. https://doi.org/10.5890/JEAM.2018.06.002

Albertini, E. (2021). What are the environmental capabilities, as components of the sustainable intellectual capital, that matter to the CEOs of European companies? *Journal of Intellectual Capital*, *22*(5), 918–937. https://doi.org/10.1108/JIC-06-2020-0215

Alnaim, M., & Metwally, A. B. M. (2024). Institutional pressures and environmental management accounting adoption: Do environmental strategy matter? *Sustainability*, *16*(7), 3020. https://doi.org/10.3390/su16073020

Amores-Salvadó, J., Castro, G. M., & Navas-López, J. (2015). The importance of the complementarity between environmental management systems and environmental innovation capabilities: A firm level approach to environmental and business performance benefits. *Technological Forecasting and Social Change*, *96*, 288–297. https://doi.org/10.1016/j.techfore.2015.04.004

Andrian, T., & Yvonne, A. S. (2021). Does code of conduct moderate corporate attributes and carbon emission disclosure? *Journal of Accounting, Business and Finance Research*, *11*(2), 46–54. https://doi.org/10.20448/2002.112.46.54

Antonini, C., & Gomez-Conde, J. (2024). Environmental management control systems and environmental innovation: Unintended consequences of the EU non-financial reporting directive. *Management Accounting Research*, 100903. https://doi.org/10.1016/j.mar.2024.100903

Baranova, P. (2022). Environmental capability development in a multi-stakeholder network setting: Dynamic learning through multi-stakeholder interactions. *Business Strategy and the Environment*, *31*(7), 3406–3420. https://doi.org/10.1002/bse.3091

Baranova, P., & Meadows, M. (2017). Engaging with environmental stakeholders: Routes to building environmental capabilities in the context of the low carbon economy. *Business Ethics: A European Review*, *26*(2), 112–129. https://doi.org/10.1111/beer.12141

Barros, R. S., & Ferreira, A. M. D. S. da C. (2022). Management control systems and innovation: A levers of control analysis in an innovative company. *Journal of Accounting and Organizational Change*, *18*(4), 571–591. https://doi.org/10.1108/JAOC-09-2020-0137

Bresciani, S., Rehman, S. U., Giovando, G., & Alam, G. M. (2023). The role of environmental management accounting and environmental knowledge management practices influence on environmental performance: Mediated-moderated model. *Journal of Knowledge Management*, *27*(4), 896–918. https://doi.org/10.1108/JKM-12-2021-0953

Burritt, R. L., Hahn, T., & Schaltegger, St. (2002). Towards a comprehensive framework for environmental management accounting — Links between business actors and environmental management accounting tools. *Australian Accounting Review*, *12*(27), 39–50. https://doi.org/10.1111/j.1835-2561.2002.tb00202.x

Burritt, R. L., Schaltegger, S., & Christ, K. L. (2023). Environmental management accounting – developments over the last 20 years from a framework perspective. *Australian Accounting Review*, *33*(4), 336–351. https://doi.org/10.1111/auar.12407

Chaudhry, N. I., & Amir, M. (2020). From institutional pressure to the sustainable development of firm: Role of environmental management accounting implementation and environmental proactivity. *Business Strategy and the Environment*, *29*(8), 3542–3554. https://doi.org/10.1002/bse.2595

Christ, K. L., & Burritt, R. L. (2013). Environmental management accounting: the significance of contingent variables for adoption. *Journal of Cleaner Production*, *41*, 163–173. https://doi.org/10.1016/j.jclepro.2012.10.007

CIMA. (2019). *An Exploration of the Implementation and Usefulness of Environmental Management Accounting*. Chartered Institute of Management Accountants, London. https://www.cimaglobal.com/Documents/Thought_leadership_docs/Academic-research/an-exploration-of-the-implementation-and-usefulness-of-environmental-management-accounting.pdf

Deb, B. C., Rahman, M. M., & Rahman, M. S. (2023). The impact of environmental management accounting on environmental and financial performance: empirical evidence from Bangladesh. *Journal of Accounting & Organizational Change*, *19*(3), 420–446. https://doi.org/10.1108/JAOC-11-2021-0157

Debnath, S., Bose, S. K., & Dhalla, R. S. (2011). Environmental management accounting: An overview of its methodological development. *International Journal of Business Insights & Transformation*, *5*(1), 44–57. http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=75377471&lang=pt-br&site=ehost-live

Demirel, P., & Kesidou, E. (2019). Sustainability-oriented capabilities for eco-innovation: Meeting the regulatory, technology, and market demands. *Business Strategy and the Environment*, *28*(5), 847–857. https://doi.org/10.1002/bse.2286

Derchi, G.-B., Davila, A., & Oyon, D. (2023). Green incentives for environmental goals. *Management Accounting Research*, *59*, 100830. https://doi.org/10.1016/j.mar.2022.100830

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, *48*(2), 147. https://doi.org/10.2307/2095101

Donovan, J. D., Masli, E. K., Topple, C., Ike, M., Borgert, T., Vanichseni, T., Lekmat, L., Hongratanawong, L., & Kunthawangso, J. (2016). Sustainability practices in Thailand. In *Corporate Sustainability Assessments* (pp. 67–87). Routledge. https://doi.org/10.4324/9781315534015-4

Dowling, J., & Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. *The Pacific Sociological Review*, *18*(1), 122–136. https://doi.org/10.2307/1388226

Einhorn, S., Fietz, B., Guenther, T. W., & Guenther, E. (2024). The relationship of organizational culture with management control systems and environmental management control systems. *Review of Managerial Science*, *18*(8), 2321–2371. https://doi.org/10.1007/s11846-023-00687-0

Ferreira, A., Moulang, C., & Hendro, B. (2010). Environmental management accounting and innovation: an exploratory analysis. *Accounting, Auditing & Accountability Journal*, *23*(7), 920–948. https://doi.org/10.1108/09513571011080180

Franco, J. de A. B., Junior, A. F., Battistelle, R. A. G., & Bezerra, B. S. (2024). Dynamic capabilities: Unveiling key resources for environmental sustainability and economic sustainability, and corporate social responsibility towards sustainable development goals. *Resources*, *13*(2), 22. https://doi.org/10.3390/resources13020022

Freeman, R. E. (2010). *Strategic Management: A Stakeholder Approach*. Cambridge University Press.

Gerged, A. M., Zahoor, N., & Cowton, C. J. (2024). Understanding the relationship between environmental management accounting and firm performance: The role of environmental innovation and stakeholder integration – Evidence from a developing country. *Management Accounting Research*, *62*, 100865. https://doi.org/10.1016/j.mar.2023.100865

Guenther, E., Endrikat, J., & Guenther, T. W. (2016). Environmental management control systems: a conceptualization and a review of the empirical evidence. *Journal of Cleaner Production*, *136*, 147–171. https://doi.org/10.1016/j.jclepro.2016.02.043

Gunarathne, N., Lee, K.-H., & Kaluarachchilage, P. K. H. (2023). Tackling the integration challenge between environmental strategy and environmental management accounting. *Accounting, Auditing & Accountability Journal*, *36*(1), 63–95. https://doi.org/10.1108/AAAJ-03-2020-4452

Gupta, V. K., & Batra, S. (2016). Entrepreneurial orientation and firm performance in Indian SMEs: Universal and contingency perspectives. *International Small Business Journal: Researching Entrepreneurship*, *34*(5), 660–682. https://doi.org/10.1177/0266242615577708

Hart, S. L. (1995). A natural-resource-based view of the firm. *The Academy of Management Review*, *20*(4), 986. https://doi.org/10.2307/258963

Hart, S. L., & Dowell, G. (2011). Invited editorial: A natural-resource-based view of the firm: Fifteen years after. *Journal of Management*, *37*(5), 1464–1479. https://doi.org/10.1177/0149206310390219

Hennig, J. C., Firk, S., Wolff, M., & Coskun, H. (2023). Environmental management control systems: Exploring the economic motivation behind their implementation. *Journal of Business Research*, *169*, 114283. https://doi.org/10.1016/j.jbusres.2023.114283

Huang, Z., & Xiao, Z. (2023). Dynamic capabilities, environmental management capabilities, stakeholder pressure and eco-innovation of Chinese manufacturing firms: A moderated mediation model. *Sustainability*, *15*(9), 7571. https://doi.org/10.3390/su15097571

Jamali, D., Lund-Thomsen, P., & Khara, N. (2017). CSR institutionalized myths in developing countries. *Business & Society*, *56*(3), 454–486. https://doi.org/10.1177/0007650315584303

Johri, A., Singh, R. K., Alhumoudi, H., & Alakkas, A. (2024). Examining the influence of sustainable management accounting on sustainable corporate governance: Empirical evidence. *Sustainability*, *16*(21), 9605. https://doi.org/10.3390/su16219605

Khan, S. A. R., Yu, Z., & Farooq, K. (2023). Green capabilities, green purchasing, and triple bottom line performance: Leading toward environmental sustainability. *Business Strategy and the Environment*, *32*(4), 2022–2034. https://doi.org/10.1002/bse.3234

Khomsiyah, K., Gunawan, J., & Nilawati, Y. J. (2023). Green accounting, environmental accounting, and sustainability: A current and future opportunity. *AFRE (Accounting and Financial Review)*, *6*(2). https://doi.org/https://doi.org/10.26905/afr.v6i2.10554

Latan, H., Jabbour, C. J. C., Jabbour, A. B. L. de S., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmental uncertainty and top management's commitment on corporate environmental performance: The role of environmental management accounting. *Journal of Cleaner Production*, *180*, 297–306. https://doi.org/10.1016/j.jclepro.2018.01.106

Lee, K.-H., & Schaltegger, S. (2018). *Asia Pacific Perspectives on Accounting for Sustainability: An Introduction* (pp. 1–8). Springer International Publishing. https://doi.org/10.1007/978-3-319-70899-7_1

Lozano, R. (2012). Towards better embedding sustainability into companies' systems: an analysis of voluntary corporate initiatives. *Journal of Cleaner Production*, *25*, 14–26. https://doi.org/10.1016/j.jclepro.2011.11.060

Mady, K., Battour, M., Aboelmaged, M., & Abdelkareem, R. S. (2023). Linking internal environmental capabilities to sustainable competitive advantage in manufacturing SMEs: The mediating role of eco-innovation. *Journal of Cleaner Production*, *417*, 137928. https://doi.org/10.1016/j.jclepro.2023.137928

Mady, K., Halim, M. A. S. A., Omar, K., Battour, M., & Abdelkareem, R. S. (2023). Environmental pressures and eco-innovation in manufacturing SMEs: the mediating effect of environmental capabilities. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-08-2022-0163

Mayndarto, E. C., & Agustine, Y. (2021). The efffect of environmental management accounting, environmental strategy on environmental performance and financial performance moderated by Managerial Commitment. *International Journal of Science, Technology & Management*, *2*(1), 112–119. https://doi.org/10.46729/ijstm.v2i1.138

Mishra, P., & Yadav, M. (2021). Environmental capabilities, proactive environmental strategy and competitive advantage: A natural-resource-based view of firms operating in India. *Journal*

of Cleaner Production, *291*, 125249. https://doi.org/10.1016/j.jclepro.2020.125249

Nguyen, H. T., Hoang, T. G., & Luu, H. (2019). Corporate social responsibility in Vietnam: Opportunities and innovation experienced by multinational corporation subsidiaries. *Social Responsibility Journal*, *16*(6), 771–792. https://doi.org/10.1108/SRJ-02-2019-0082

Nkrumah, S. K., Asamoah, D., Annan, J., & Agyei-Owusu, B. (2021). Examining green capabilities as drivers of green supply chain management adoption. *Management Research Review*, *44*(1), 94–111. https://doi.org/10.1108/MRR-01-2020-0015

Nkundabanyanga, S. K., Muramuzi, B., & Alinda, K. (2021). Environmental management accounting, board role performance, company characteristics and environmental performance disclosure. *Journal of Accounting & Organizational Change*, *17*(5), 633–659. https://doi.org/10.1108/JAOC-03-2020-0035

O'Donovan, G. (2002). Environmental disclosures in the annual report. *Accounting, Auditing & Accountability Journal*, *15*(3), 344–371. https://doi.org/10.1108/09513570210435870

Odang, N. K., & Sinambela, J. S. (2025). Does environmental management accounting associated with sustainability report disclosure? *Jurnal Akuntansi Integratif*, *4*(2), 16–28.

Odang, N. K., Taufiqurrahman, T., & Sitopu, A. H. (2025). Signifikansi agresivitas pajak ditilik dari aspek keberlanjutan perusahaan. *Jurnal Akuntansi Indonesia*, *14*(1), 52–66. https://doi.org/http://dx.doi.org/10.30659/jai.14.1.52%20-%2066

Ong, T. S., Lee, A. S., Latif, B., Sroufe, R., Sharif, A., & Heng Teh, B. (2022). Enabling green shared vision: linking environmental strategic focus and environmental performance through ISO 14001 and technological capabilities. *Environmental Science and Pollution Research*, *30*(11), 31711–31726. https://doi.org/10.1007/s11356-022-24280-2

Ong, T. S., Magsi, H. B., & Burgess, T. F. (2019). Organisational culture, environmental management control systems, environmental performance of Pakistani manufacturing industry. *International Journal of Productivity and Performance Management*, *68*(7), 1293–1322. https://doi.org/10.1108/IJPPM-05-2018-0187

Perego, P., & Hartmann, F. (2009). Aligning performance measurement systems with strategy: The case of environmental strategy. *Abacus*, *45*(4), 397–428. https://doi.org/10.1111/j.1467-6281.2009.00297.x

Petera, P., Wagner, J., & Pakšiová, R. (2021). The influence of environmental strategy, environmental reporting and environmental management control system on environmental and economic performance. *Energies*, *14*(15), 4637. https://doi.org/10.3390/en14154637

Pondeville, S., Swaen, V., & De Rongé, Y. (2013). Environmental management control systems: The role of contextual and strategic factors. *Management Accounting Research*, *24*(4), 317–332. https://doi.org/10.1016/j.mar.2013.06.007

Rehman, S. U., Bhatti, A., Kraus, S., & Ferreira, J. J. M. (2021). The role of environmental management control systems for ecological sustainability and sustainable performance. *Management Decision*, *59*(9), 2217–2237. https://doi.org/10.1108/MD-06-2020-0800

Saeed, A., Jun, Y., Nubuor, S. A., Priyankara, H. P. R., & Jayasuriya, M. P. F. (2018). Institutional pressures, green supply chain management practices on environmental and economic performance: A two theory view. *Sustainability*, *10*(5), 1517. https://doi.org/10.3390/su10051517

Sawe, F. B., Kumar, A., Garza-Reyes, J. A., & Agrawal, R. (2021). Assessing people-driven factors for circular economy practices in small and medium-sized enterprise supply chains: Business strategies and environmental perspectives. *Business Strategy and the Environment*,

30(7), 2951–2965. https://doi.org/10.1002/bse.2781

Scarpellini, S., Marín-Vinuesa, L. M., Aranda-Usón, A., & Portillo-Tarragona, P. (2020). Dynamic capabilities and environmental accounting for the circular economy in businesses. *Sustainability Accounting, Management and Policy Journal*, *11*(7), 1129–1158. https://doi.org/10.1108/SAMPJ-04-2019-0150

Schaltegger, S. (2003). An Introduction to Corporate Environmental Management: Striving for Sustainability. *Management of Environmental Quality: An International Journal*, *14*(4), 541–542. https://doi.org/10.1108/meq.2003.14.4.541.4

Schaltegger, S., Bennett, M., & Burritt, R. (2006). Sustainability Accounting and Reporting: Development, Linkages and Reflection. An Introduction. In *Sustainability Accounting and Reporting* (pp. 1–33). Springer Netherlands. https://doi.org/10.1007/978-1-4020-4974-3_1

Simbolon, R. S., & Odang, N. K. (2024). Sustainability report disclosure and investor reaction: An explanatory study on infrastructure sector companies. *JRAM (Jurnal Riset Akuntansi Multiparadigma)*, *11*(2), 30–42. https://doi.org/http://dx.doi.org/10.30743/akutansi.v11i2.10122

Solovida, G. T., & Latan, H. (2017). Linking environmental strategy to environmental performance. *Sustainability Accounting, Management and Policy Journal*, *8*(5), 595–619. https://doi.org/10.1108/SAMPJ-08-2016-0046

Tarifa-Fernández, J., Céspedes-Lorente, J., & de Burgos Jiménez, J. (2023). Drivers of environmental sustainability: environmental capabilities and supply chain integration. *Management of Environmental Quality: An International Journal*, *34*(3), 843–861. https://doi.org/10.1108/MEQ-08-2022-0217

Walls, J. L., Phan, P. H., & Bacrone, P. (2008). *An Assessment of the Construct Validity of Environmental Strategy Measures* (WP-754).

Walls, J. L., Phan, P. H., & Berrone, P. (2011). Measuring environmental strategy: Construct development, reliability, and validity. *Business & Society*, *50*(1), 71–115. https://doi.org/10.1177/0007650310394427

Wang, S., Wang, H., & Wang, J. (2019). Exploring the effects of institutional pressures on the implementation of environmental management accounting: Do top management support and perceived benefit work? *Business Strategy and the Environment*, *28*(1), 233–243. https://doi.org/10.1002/bse.2252

Waxin, M.-F., Bartholomew, A., Zhao, F., & Siddiqi, A. (2023). Drivers, challenges and outcomes of environmental management system implementation in public sector organizations: A systematic review of empirical evidence. *Sustainability*, *15*(9), 7391. https://doi.org/10.3390/su15097391

Wicaksono, A. P. (2024). Stakeholder pressure and environmental disclosure in Southeast Asia's mining companies. *Jurnal Dinamika Akuntansi Dan Bisnis*, *11*(2), 229–246. https://doi.org/10.24815/jdab.v11i2.32759

Wong, D. T. W., & Ngai, E. W. T. (2021). Economic, organizational, and environmental capabilities for business sustainability competence: Findings from case studies in the fashion business. *Journal of Business Research*, *126*, 440–471. https://doi.org/10.1016/j.jbusres.2020.12.060