Sustainability management control system and sustainability performances in Indonesia

 Sigit Kurnianto[1]
 Bambang Tjahjadi[2+]

[1,2]*Airlangga University, Indonesia.*
[1]*Email: sigit.kurnianto-2021@feb.unair.ac.id*
[2]*Email: bambang.tjahjadi@feb.unair.ac.id*

(+ Corresponding author)

ABSTRACT

This study aims to determine the effect of the Sustainability Management Control System (SMCS) on improving Sustainable Performance (SP) or corporate sustainability performance. The study utilizes the data from 412 non-financial companies listed on the Indonesia Stock Exchange, covering the period from 2017-2021. Hypothesis testing was carried out with a least squares regression model strengthened by robustness tests. To support the results, a number of other studies were carried out, including panel data, sensitivity testing, and the coarsened exact matching approach. The results showed a positive correlation between SMCS and improving sustainability performance. This means that the better the implementation of SMCS in a company, the more its sustainability performance will improve. This indicates the important role of SMCS in supporting the improvement of corporate sustainability performance. The practical implication of this research is to provide insight for executives, policymakers, and stakeholders to encourage the implementation of SMCS to achieve the success of sustainable development. In terms of theoretical contribution, this research elucidates the relationship between SMCS and sustainability performance, highlighting that SMCS is a development of the Management Control Systems (MCS) concept, incorporating new metrics. Overall, this research is useful for understanding the effectiveness of SMCS in improving corporate sustainability performance.

Contribution/Originality: This research contributes to the literature by explaining the relationship between SMCS and sustainability performance. The Management Control System (MCS) expands with SMCS, employing fresh metrics that remain largely unexplored in research.

1. INTRODUCTION

The influence of Environmental, Social, and Governance (ESG) on investor decisions is an increasingly important phenomenon in the investment world. Due to the realization that environmental, social, and governance (ESG) variables might impact investment possibilities and dangers, investors are paying more attention to these elements when making decisions. ESG factors that include environmental, social, and governance considerations indicate the non-financial performance of a company (Al Hawaj & Buallay, 2022). You can use the ESG level to asses a company's sustainability performance. By fostering a culture of trust among stakeholders, investing in ESG practices can enhance a company's reputation and thus boost its value.

A company's attempt to balance its financial and environmental goals in order to maximize value across all aspects of corporate sustainability is known as sustainability performance, or SP (Figge, Hahn, Schaltegger, & Wagner, 2002). SP creates long-term value for all stakeholders. Companies with a high ESG index will indirectly encourage investor sentiment (Dhasmana, Ghosh, & Kanjilal, 2023) in providing financial assistance to the company.

Sustainable performance can reduce environmental, social, and economic risks, increase efficiency, and enable companies to answer consumer demands that are increasingly concerned about social and environmental issues (Rachman, Efendi, & Wicaksana, 2011). Therefore, sustainability performance can be an important goal for companies.

To generate high-quality ESG, an MCS supporting framework is essential. Organizations can use this framework to compare actual results with pre-established goals and objectives. MCS are critical to the success of companies given their importance in developing winning tactics that are useful for improving company performance (Nicolas, Müller, & Arroyo-Cañada, 2021). Gond, Grubnic, Herzig, and Moon (2012) claim that integrating the sustainability control system within the organization's traditional MCS is critical for delivering sustainability policies, which is then referred to as the Sustainability Management Control System (SMCS). SMCS is a framework that organizations use to monitor and manage corporate sustainability performance. It encompasses various sustainability aspects, including environmental, social, and economic dimensions. SMCS is crucial in helping organizations monitor, coordinate, and manage their sustainability initiatives by providing essential tools and resources (Adib, Zhang, Zaid, & Sahyouni, 2021; Asiaei, Bontis, Barani, Moghaddam, & Sidhu, 2022; Corsi & Arru, 2020). Organizations can track their progress, set targets, and make well-informed decisions that support sustainable development objectives with the use of SMCS. In order to achieve higher sustainability goals, SMCS is essential, as it not only impacts the company's performance reporting framework but also motivates businesses to continuously improve their practices by comparing actual results with previously set goals and objectives on an ongoing basis.

Previous research explains the positive relationship between MCS and corporate performance (Felício, Samagaio, & Rodrigues, 2021; Henri & Journeault, 2010). Dharmayanti, Ismail, Hanifah, and Taqi (2023) also examined the application of MCS, which has an important role in improving sustainability performance. Consequently, the utilization of SMCS serves as a catalyst, allowing organizations to measure performance, enabling firms to monitor outcomes, guarantee adherence to regulations, control hazards, foster cooperation, and support continuous improvements in sustainable practices. However, despite previous literature examining MCS, there has never been research that explicitly examines how the development of MCS, specifically SMCS, can contribute to increasing SP in developing countries like Indonesia through formal control. Formal controls serve as the foundation for integrating sustainability into core operations (De Villiers & Maroun, 2018). Therefore, the implementation of SMCS through formal control is crucial, as the incorporation of sustainability issues into core operations directly impacts the organization's decision-making process.

The purpose of this study is to determine the effect of SMCS on increasing SP. This study employs two theories, the resource-based view and the stakeholder theory, to elucidate the correlation between SMCS and SP. A resource-based view is used to explain the relationship between SMCS and the use of organizational resources to achieve sustainability. This theory states that differences in company performance are caused by differences in resources owned. To make these resources valuable, rare, inimitable, and irreplaceable, proper management is necessary (Barney, 1991). An organization's internal resources are tools for the purpose of creating competitive advantage (Tjahjadi, Soewarno, Nadyaningrum, & Aminy, 2022). Capabilities that facilitate sustainable economic activities from the foundation of current and future strategies and competitive advantages. SMCS are unique and valuable internal resources that assist companies in making the right decisions related to resource allocation, capability development, and improving operational efficiency to achieve sustainability goals. According to the resource-based view, SMCS will lead to an increase in SP.

This study employs the stakeholder theory to elucidate the significant role that SP plays for stakeholders. According to stakeholder theory, a company's primary responsibility extend beyond shareholders to include other stakeholders (Donaldson & Preston, 1995). Organizations should consider stakeholders' expectations, regardless of their level of authority or influence over corporate operations. According to Erin, Adegboye, and Bamigboye (2022) all stakeholders have the right to access information on financial matters, social, environmental, and governance aspects. In an effort to meet stakeholder expectations and interests, companies need to pay attention to sustainability

performance indicators by conducting socially and environmentally responsible operations, as well as paying attention to the long-term interests and welfare of society. An important role that SMCS can play is to help companies better deal with their social and environmental responsibilities (Ditillo & Lisi, 2014).

We chose Indonesia as the institutional setting for the main reason of sustainability regulation. An increasing number of companies in Indonesia are actively participating in sustainability report disclosure, which encompasses information on economic, social, and environmental aspects (KPMG, 2015). A number of existing regulations in Indonesia have supported sustainable development efforts. OJK Regulation Number 51/POJK.03/2017 on the Implementation of Sustainable Finance for Financial Services Institutions, Issuers, and Public Companies aims to enable securities companies to incorporate sustainable finance principles into their operations. This regulation also aims to accelerate the implementation of ESG in Indonesia. In addition, the Otoritas Jasa Keuangan (OJK) has developed a guide known as the Green Taxonomy, which classifies environmentally friendly economic activities as a tangible form of Indonesia's commitment to the international community in environmental protection and management as well as climate change mitigation and adaptation. OJK has also established the Sustainable Finance Roadmap Phase II (2021-2025), which is a continuation of the Roadmap Phase I (2015-2019), which focuses on creating a comprehensive sustainable finance ecosystem through collaboration with various related parties. Thus, the adoption of sustainable finance is projected to improve Indonesia's financial stability by managing social and environmental risks while also achieving the world's important agenda of sustainable development goals and climate change.

This study empirically tests whether SMCS can increase SP. This study uses data on all companies listed on the Indonesia Stock Exchange (IDX) for the period 2017-2021 (5 years) and obtains a research sample of 412 companies. Content analysis is needed to obtain data related to the sustainability management control system variable through the annual report and sustainability report of each company based on the research period published on the company's official website or the publication of the company's annual report that has been listed on the IDX. ESG scores referring to the Airlangga University ESG Intelligence (ESGI) dataset were used to measure SP. Testing the influence of SMCS on increasing SP with a regression model. In addition, we conducted further analysis by categorizing the sample into industries with high institutional ownership and low institutional ownership, as well as robustness tests based on the coarse-exact matching method.

This study found that SMCS has a positive relationship with SP. Based on additional analysis, this study also shows that SMCS has a positive effect on SP for industries with high institutional ownership. Meanwhile, testing in industries with low institutional ownership shows that SMCS has no effect on SP. Other tests of robustness have also been conducted to verify the primary results. The results indicate that SMCS has a significant impact on improving performance sustainability.

Several factors reinforce the research's uniqueness. First, this study examined SMCS, which is the development of MCS. No one has ever studied the relationship between SMCS and SP before. Second, this study uses new measurements in SMCS. Third, this study uses data from companies in developing economies.

The implementation of SMCS has social implications for sustainable development. SMCS assists companies in identifying risks and opportunities associated with sustainability issues. By understanding and managing environmental, social, and governance risks, companies can reduce negative impacts on the environment and society and capitalize on opportunities for innovation and sustainable growth. SMCS includes mechanisms for assessing the social impacts of an organization's activities. It involves assessing the impact of an organization's operations, products, and services on local communities, employees, customers, and other stakeholders. SMCS empowers companies to enhance their positive contributions to both the environment and society.

The SMCS promotes transparency and reports of corporate sustainability performance to stakeholders. Its implementation allows companies to measure and monitor their sustainability performance effectively. By gathering

relevant data and measuring appropriate performance indicators, companies can assess their progress toward achieving sustainability goals, identify areas for improvement, and implement necessary corrective actions.

Furthermore, SMCS assists businesses in operating sustainably by ensuring legal compliance, enabling environmental improvements, fostering product innovation, and promoting cost-effective practices (Henri & Journeault, 2010; Schaltegger & Csutora, 2012). With the implementation of SMCS, companies can also enhance their operational efficiency. By adopting more sustainable practices, such as energy efficiency, waste management, and responsible use of raw materials, companies can reduce operational costs and improve long-term sustainability. Thus, the implications of SMCS practices can increase firm value. This research aims to assist company executives in the implementation of sustainable management control system policies. Regulators and companies can utilize this research to reconsider SMCS, as it supports companies in improving their sustainability performance.

This research also makes a theoretical contribution to the enrichment of corporate governance literature on management control systems that consider sustainability aspects. This research presents a fresh perspective on the impact of SMCS on enhancing sustainability performance, which is just as significant as focusing solely on financial performance.

This study is organized as follows: Section 2 presents a literature review and hypothesis development. Section 3 presents research methodology and illustrates the sample selection, variable construction, research framework, and regression models. The results are provided in Section 4, and the conclusion is presented in Section 5.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Resource Based View (RBV)

According to the Resource-Based View (RBV), a company can attain competitive edge by leveraging its resources to guide the company towards sustainability (Barney, 1986). RBV suggests that the performance of firms largely hinges on their capacity to efficiently and effectively coordinate strategic actions and combine resources and capabilities (Barney, 1995; Oduro & Haylemariam, 2019). Factors such as organizational vacancies, globalization position in the value chain, management attitudes and motivations, and strategic priorities influence the sustainability pressures stemming from resources (Bansal, 2005). This RBV can analyze the internal environment from various points of view in terms of both strengths and weaknesses, which helps companies take advantage of existing opportunities and avoid potential threats and analyze the company's capabilities that affect the final product, which include skills, capabilities, and dynamic resources. Therefore, a company's success heavily relies on its ability to allocate resources, develop capabilities, and increase operational efficiency, all crucial for achieving long-term sustainability. SMCS is a company's internal resource that can create a competitive advantage to achieve sustainability performance. RBV can explain the relationship between SMCS and sustainability performance.

2.2. Stakeholder Theory

Stakeholder theory states that a company is an entity that does not act solely in its own interest but is committed to providing benefits to its stakeholders or interest groups (Freeman, 1984). Stakeholders here are not only owners and investors called shareholders, but also society, social environment, and management. This theory also explains the importance of companies providing information on sustainability, including financial and social performance. Information provision is key to stakeholder management (Kend, 2015). Engaging with various stakeholders allows companies to identify needs, manage relevant resources, and demonstrate commitment to sustainability. Therefore, companies need to maintain relationships with stakeholders, especially those who have significant influence over key resources such as employees, customers, and owners (Chariri & Ghozali, 2007).

It is important for companies to maintain good relationships with their stakeholders because they have the skills to manage resources that are vital to the survival of the company. Through these good relationships, companies can improve risk assessment and create significant value (Fazzini & Dal Maso, 2016). Corporate Social Responsibility

(CSR) information, which is considered value-relevant, provides guidance for investors in assessing firm performance (Cheng, Green, & Ko, 2015; Luo, Wang, Raithel, & Zheng, 2015). By meeting the expectations of stakeholders and integrating sustainability aspects into the company's strategy, the value of the company can be increased. The hope is that stakeholders will contribute to the company if the performance of a company has increased, and this performance can be measured using one indicator, namely SP. Thus, stakeholder theory can explain the relationship between SMCS and SP.

2.3. Literature Review

SMCS plays an important role in helping organizations to better align, measure, and manage social, environmental, and economic impacts so as to achieve improved company performance (Asiaei et al., 2022). A company faces varying risks from its various resources, including unavailability, hidden costs, information asymmetry, moral hazard, misperceptions, inaccurate assessment of the situation, and lack of motivation and job satisfaction (Bogodistov & Wohlgemuth, 2017). De Villiers and Maroun (2018) define SMCS as a collection of formal and informal mechanisms, processes, systems, and networks that organizations use to communicate the main goals and objectives in the field of sustainability set by management. The goal is to assist ongoing strategic and managerial activities by analyzing, planning, measuring, controlling, rewarding, and managing sustainability performance, as well as promoting and encouraging organizational learning and change. To evaluate, strategically plan, and implement the sustainability agenda, companies need to establish a control system (Kazemian et al., 2022; Riccaboni & Leone, 2010). Additionally, by enhancing the accountability and transparency of operational procedures, SMCS helps businesses address sustainability opportunities and challenges while reducing agency costs. SMCS can significantly impact sustainability performance. Previous research has indicated that SMCS, in conjunction with environmental strategy and organizational capability, provides numerous benefits for non-financial companies seeking to improve their sustainability performance (Rehman, Bhatti, Kraus, & Ferreira, 2021). De Villiers and Maroun (2018) say that SMCS is made up of eight formal indicators. These are operational performance controls, goals and targets, measures and performance management systems, measurement and monitoring systems, environmental management accounting (EMA), incentive systems, budgets, and communication systems. If these eight formal controls are effectively fulfilled by SMCS, it indicates that the system is functioning well and efficiently within the company. Therefore, a well-designed SMCS is essential for supporting, implementing, and formulating sustainability-oriented strategies and policies (Crutzen, Zvezdov, & Schaltegger, 2017; Durden, 2008; Epstein & Roy, 2001; Gond et al., 2012; Perego & Hartmann, 2009).

Numerous research studies have investigated the connection between MCS and business performance. Previous studies show a positive correlation between company performance and stronger reliance on strategy MCS implementation (Felício et al., 2021; Henri & Journeault, 2010). Ittner and Larcker (2001) work further supports this finding by highlighting the significant role of MCS in aligning priorities with organizational goals, thereby enhancing organizational performance. Furthermore, this study is consistent with the results of research by Setiyawan, Ismail, Muchlish, and Indriana (2024) which states that MCS affects organizational performance through innovation by testing the mediating role of innovation, this plays an important role for companies in Indonesia in order to compete in a globally competitive market (Nani & Safitri, 2021). Lueg and Radlach (2016) also found that SMCS plays a role in enhancing financial performance sustainably. SMCS enhances financial performance in a sustainable way forging a robust link between sustainable development (SD), financial incentives, and other forms of compensation in contemporary organizations, thereby requiring the implementation of multiple controls to complement each other. This is also in line with the claim that the Sustainability Control System (SCS) partially mediates the relationship between proactive sustainability strategies and corporate sustainability performance (Wijethilake, 2017). Recent research related to SMCS with organizational performance also supports previous research by stating that the higher the company relies on SMCS, the greater the organizational performance (Asiaei et al., 2022). Other research shows

that implementing sustainability in MCS positively influences sustainability performance along the value chain facilitated by intensive dialog between strategic and tactical management. However, challenges in developing sustainable products led the company to shift to a cost-based business model, improving economic efficiency and supporting its sustainability strategy (Beusch, Frisk, Rosén, & Dilla, 2022). This aligns with the study emphasizes sustainability performance, stressing the importance of adopting sustainable operational practices (Jutidharabongse, Imjai, Pantaruk, Surbakti, & Aujirapongpan, 2024).

2.4. Hypotheses Development

The effect of SMCS on increasing SP is strongly supported by RBV which explains that a company can achieve competitive advantage by relying on resources to direct the company in a sustainable direction (Barney, 1986) so that based on this theory it can be interpreted that a tool is needed to be able to control and allocate resources so that these resources can contribute to improving company performance. As a result, if the company's performance continues to increase, stakeholders will be interested in investing and disbursing resources to the company so that this company can continue to survive for the long term (sustain). consequently, this study formulates the following hypothesis:

H_1: SCMS has a positive relationship with SP improvement.

3. RESEARCH METHODOLOGY

3.1. Research Design

Figure 1 shows the research framework that explains the relationship between the research variables. SMCS is hypothesized to have a positive relationship with SP. Control variables are included to control the influence of other variables on SP.
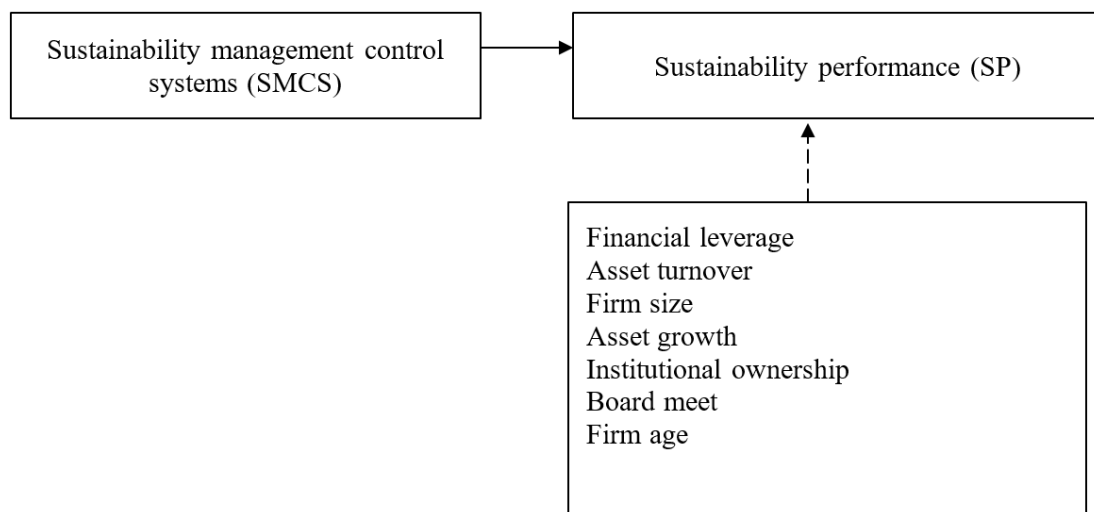

Figure 1. Research framework.

3.2. Research Population

The population of this study consists of data from all non-financial companies listed on the IDX or Indonesian Stock Exchange for the period 2017-2021. The data sources in this study include annual reports and corporate sustainability reports and the Ongoing Standardized Information Retrieval Integrated Systems (OSIRIS) database. The final sample of this study consists of 412 companies.

3.3. Sampling Method

Purposive sampling, a non-probability sampling approach, is used in this study to choose the companies that would make up the research sample. This strategy specifically selects companies with sustainability reports, indicating that they possess specific attributes relevant to the research topic. This was done because this research focuses on companies that implement Sustainable Management Control Systems (SMCS) and Sustainable Performance (SP), and information regarding SMCS and SP is generally contained in sustainability reports. Th company's sustainability report provides the SMCS Score data. Financial reports provide the SP data. This research uses a quantitative method approach with numerical data as support for testing hypotheses based on scientific theories that have objective, measurable, rational, and systematic characteristics. To determine the type of influence these factors have, the cause-and-effect relationship between independent and dependent variables is tested using a quantitative technique. Panel A explains the sample selection method, while Panel B explains the data distribution. Because their production processes have a major negative impact on the environment and are linked to a higher risk of health problems, companies in the mining and manufacturing industries are typically more proactive in sharing information about their social and environmental performance. Table 1 divides these criteria into two panels, Panel A and Panel B, to explain the sample distribution. Panel A explains the criteria for selecting companies that will be used as research samples while Panel B explains the classification of companies per year based on SIC.

Table 1. Sample distribution.

Description				Total		
Panel A: Distribution of data sample selection						
Companies listed on IDX and published sustainability reports in 2017-2021				647		
Companies that do not have complete data and information				235		
Total research sample 2017-2021				412		
Panel B: Distribution of data by industry and year SIC (Standard industrial classification)						
Industrial classification	2017	2018	2019	2020	2021	Total
(SIC 0) Agriculture, forestry and fisheries	5	5	4	6	8	28
(SIC 1) Mining	16	14	22	20	34	106
(SIC 2) Construction industries	11	11	13	16	33	84
(SIC 3) Manufacturing	6	8	8	6	16	44
(SIC 4) Transportation, communications and utilities	10	8	10	11	22	61
(SIC 5) Wholesale and retail trade	2	2	3	7	12	26
(SIC 6) Depository institutions	4	4	3	6	21	38
(SIC 7) Service industries	2	1	1	3	7	14
(SIC 8) Health, legal, educational services and consulting	0	0	2	2	7	11
Total	56	53	66	77	160	412

3.4. Adopted Instrument/ Estimation Technique with their Validity and Reliability Tests

3.4.1. Measurement of SP

Sustainable Performance (SP) is a performance that refers to the ability of an organization to thrive in the long run by balancing and considering environmental, social, and governance (ESG) factors. This involves integrating sustainability principles and practices into the organization's strategy, operations, and decision-making processes. ESG factors are progressively becoming the three most essential parameters for determining the sustainability of economic players in the global society (Wang, Pan, Feng, & Du, 2023; Yu, Van Luu, & Chen, 2020). Organizations refer to various measurements when choosing sustainability performance measures, even though there are no universally recognized standards or guidelines (Adams, Muir, & Hoque, 2014). In this study, SP is measured using ESG scores that refer to research conducted by Alareeni and Hamdan (2020). Investors and other concerned parties utilize ESG scores to evaluate corporate risks and opportunities (Bassen & Kovács, 2008). Financial statements do not include ESG, but the sustainability report does. ESG reports include a comprehensive review of various aspects,

including natural resource utilization, human resource management, and even instances of fraud within the company. As a result, stakeholders should consider ESG as a crucial factor when evaluating the resilience of a company.

3.4.2. Measurement of SMCS

Sustainable Management Control Systems (SMCS) is a framework that integrates the organization of sustainable management control within a company, aiming to achieve stable economic value while also considering social and environmental interests. With this framework, management can facilitate continuous process improvement and minimize risks arising from environmental and social challenges. According to Eldridge, van Iwaarden, van der Wiele, and Williams (2013) the concept of sustainability management control enables the generation of data for internal users to support the decision-making process. The ultimate goal of SMCS considers two patterns: internal benefit, related to performance improvement, strategy operationalization, and capability building; and external benefit, related to transparency, compliance, and meeting the expectations of external stakeholders (Gonzalez & Ramírez, 2016; Maas, Schaltegger, & Crutzen, 2016). In this study, SMCS is measured by a scoring system developed based on seven indicators reflecting key elements of SMCS, such as sustainability operational performance controls and communication systems. Pre-testing with sustainability experts and inter-rater reliability tests can establish the validity and reliability of this scoring system, ensuring consistency in scoring across different researchers.

3.4.3. Definition and Sources

Table 2 explains the variables used in this study along with their definitions and sources:

Table 2. Variable definition.

Variables	Definitions	Sources
Dependent variables		
ESG	The ESG score is the actual disclosure score obtained using measurements based on GRI standards for companies that issue sustainability reports, with accumulations covering every environmental, social, and corporate governance element (Alareeni & Hamdan, 2020).	ESGI dataset of Universitas Airlangga
Independent variables		
SMCS	The SMCS is a framework for structuring sustainability management and is useful for managers in systematically integrating sustainability into business processes (Eldridge et al., 2013). The sustainability management control system score represents the sum total of the sustainable management control system variable values calculated based on the following calculations:	
	SMCS Score = Sustainability operational performance controls + Sustainability goals and targets + Sustainability measures and performance management system + Sustainability measurement and monitoring system + Environmental management accounting (EMA) + Incentive systems + Budgets + Communication systems	
	If they meet the criteria through content analysis, they receive a score of 1.	
Control variables		
FLEV	Total liabilities divided by total assets (Harymawan, Nasih, Agustia, Ratri, & Nowland, 2020).	Osiris
ATURN	Asset turnover shows how many times the funds invested in fixed assets rotate in one period (Andansari, Raharjo, & Andini, 2016).	Annual report
FSIZE	Total assets divided by natural logarithm yields the firm size (Hou, Liu, Pang, & Xiong, 2020).	Osiris

Variables	Definitions	Sources
AGROWTH	Asset growth is measured by the annual change in total assets (Alareeni & Hamdan, 2020).	Annual report
INST	The percentage of shares owned by institutional investors is calculated by dividing the number of shares they own by the total number of shares outstanding. (Santoso, 2017).	Annual report
BMEET	Frequency of board meetings in a year (Brick & Chidambaran, 2010).	Annual report
FAGE	The number of years of incorporation of the company; or it can be defined as the age of the company, (Shumway, 2001).	Annual report

3.4.4. Estimation Technique

This study uses several analytical techniques, namely descriptive statistical tests and Pearson correlation tests. To quantify the relationship between SMCS and SP while controlling for the influence of other relevant factors, this study employs regression analysis as the primary estimation technique. The regression model will incorporate the SMCS score obtained from the content analysis and the ESG score representing SP. The model will also incorporate control variables like leverage, asset turnover, firm size, asset growth, institutional ownership, board meeting frequency, and firm age to consider their potential impact on a company's sustainable performance. Furthermore, the analysis includes testing for both high and low industrial growth, as well as conducting a robustness test using the coarsened exact matching method to reinforce the results. This technique helps create a comparable control group without sustainability reports that closely resembles the companies with reports based on other relevant characteristics, such as industry sector, firm size, or financial ratios. By comparing the results obtained from the regression analysis with those from the CEM analysis, we can enhance the confidence in the findings and minimize the influence of selection bias on the observed relationship between SMCS and SP. The equation model applied in this study is detailed as follows:

3.4.4.1. Hypotheses

The results of statistical analysis will be described to find solutions to the problems posed in this study. The hypotheses are outlined below:

$$
\begin{aligned}
ESG_{i,t} = QUOTE\ & \beta_0 + \beta_1 SMCS_{i,t} + \beta_2 FLEV_{i,t} + \beta_3 ATURN_{i,t} + \beta_4 FSIZE_{i,t} + \beta_5 AGROWTH_{i,t} \\
& + \beta_6 INST_{i,t} + \beta_7 BMEET_{i,t} + \beta_8 FAGE_{i,t} + YEAR_{i,t} + INDUSTRY_{i,t} \\
& + \varepsilon\ \beta_0 + \beta_1 SMCS_{i,t} + \beta_2 FLEV_{i,t} + \beta_3 ATURN_{i,t} + \beta_4 FSIZE_{i,t} + \beta_5 AGROWTH_{i,t} + \beta_6 INST_{i,t} \\
& + \beta_7 BMEET_{i,t} + \beta_8 FAGE_{i,t} + YEAR_{i,t} + INDUSTRY_{i,t} + \varepsilon
\end{aligned}
$$

4. RESULT

4.1. Descriptive Statistics and Correlation Matrix

Table 3 presents the descriptive statistics for all variables in this study. The independent variable, SMCS, has an average value of 7.138, with minimum and maximum values of 5,000 and 8,000, respectively. The dependent variable, ESG, has a mean value of 0.618, ranging from a minimum of 0.206 to a maximum of 0.973. Several control variables are included: FLEV, with an average of 0.494, a minimum of 0.075, and a maximum of 0.896; ATURN, averaging 0.694, with a range from 0.011 to 4.510; FSIZE, with an average of 23.197, a minimum of 18.627, and a maximum of 25.494; AGROWTH, with an average of 0.093, a minimum of -0.974, and a maximum of 2.418; INST, averaging 49.317, with a minimum of 0.000 and a maximum of 97.370; BMEET, with an average of 7,265, ranging from 1,000 to 22,000; and FAGE, with an average of 36,981, a minimum of 5,000, and a maximum of 87,000.

Table 3. Descriptive statistic.

Variables	Mean	Median	Minimum	Maximum
ESG	0.618	0.626	0.206	0.973
SMCS	7.138	7.000	5.000	8.000
FLEV	0.494	0.496	0.075	0.896
ATURN	0.694	0.570	0.011	4.510
FSIZE	23.197	23.372	18.627	25.494
AGROWTH	0.093	0.054	–0.974	2.418
INST	49.317	59.315	0.000	97.370
BMEET	7.265	6.000	1.000	22.000
FAGE	36.981	35.500	5.000	87.000

4.2. Pearson's Correlation

Table 4 presents the results of the Pearson correlation test. This parametric method yields a coefficient that measures both the strength and direction of the linear relationship between two variables (Latan, Noonan, & Matthews, 2017). SMCS has a value of 0.190, where this value is significant and positive towards ESG. Other control variables like FSIZE, which has a correlation value of 0.119, suggest that as a company's ESG score improves, its size tends to increase as well. This could imply that larger companies are more likely to prioritize sustainable practices. The second variable, BMEET, has a statistically significant positive correlation of 0.151, which indicates that companies with higher ESG scores tend to hold more analyst meetings. This could be because investors are increasingly interested in ESG factors and are more likely to engage with companies that demonstrate strong ESG performance. The next variable that has a significant positive value is FAGE, where the value is equal to 0.137. It suggests that older companies tend to have slightly better ESG scores. This could imply that companies with a longer track record are more likely to have established ESG policies and practices. However, FLEV, ATURN, AGROWTH, and INST are not correlated with ESG.

Table 4. Pearson correlation.

Variables	ESG	SMCS	FLEV	ATURN	FSIZE	AGROWTH	INST	BMEET	FAGE
ESG	1.000								
SMCS	0.190***	1.000							
	(0.000)								
FLEV	–0.019	0.021	1.000						
	(0.704)	(0.671)							
ATURN	–0.023	0.005	–0.067	1.000					
	(0.635)	(0.927)	(0.176)						
FSIZE	0.119**	0.273***	0.199***	–0.143***	1.000				
	(0.016)	(0.000)	(0.000)	(0.004)					
AGROWTH	–0.025	–0.045	–0.009	0.175***	0.094*	1.000			
	(0.607)	(0.360)	(0.854)	(0.000)	(0.057)				
INST	–0.028	0.016	0.072	–0.063	–0.035	0.055	1.000		
	(0.566)	(0.745)	(0.146)	(0.201)	(0.482)	(0.265)			
BMEET	0.151***	0.032	0.215***	–0.033	0.161***	0.104**	0.063	1.000	
	(0.002)	(0.511)	(0.000)	(0.505)	(0.001)	(0.034)	(0.201)		
FAGE	0.137***	0.179***	0.178***	0.190***	0.216***	–0.002	–0.233***	0.101**	1.000
	(0.005)	(0.000)	(0.000)	(0.000)	(0.000)	(0.968)	(0.000)	(0.040)	

Note: t statistics in parentheses.
*$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

4.3. Regression Results

We analyze the relationship between SMCS and ESG using three models; these models can be seen in Table 5. Model 1 excludes control variables and industry and year effects; Model 2 includes only control variables; and Model 3 includes all three. The magnitude of the R-squared value shows the influence of SMCS and ESG on the three models. In Model 1, the r2 value is 0.034, indicating that SMCS can influence about 3.4% of the variation in ESG. In Model

2, r2 increases to 0.050, indicating that, in addition to SMCS, control factors also positively influence ESG performance. However, Model 3 shows the most significant increase, with r2 rising to 0.219, suggesting that SMCS accounts for nearly 25% of the observed variation in ESG performance. Despite the involvement of industry and year effects, SMCS plays an important role in improving ESG performance, even in the presence of other factors.

Table 5. Regression result SMCS and ESG.

Variables	(1) ESG	(2) ESG	(3) ESG
SMCS	0.040**	0.032**	0.024*
	(3.62)	(2.79)	(2.23)
FLEV		–0.053	–0.030
		(–1.44)	(–0.97)
ATURN		–0.015	–0.002
		(–0.89)	(–0.09)
FSIZE		0.003	0.010*
		(0.60)	(2.01)
AGROWTH		–0.020	0.004
		(–0.71)	(0.18)
INST		–0.000	0.000*
		(–0.10)	(1.94)
BMEET		0.004*	0.002
		(2.28)	(1.24)
FAGE		0.001*	0.001*
		(2.03)	(2.31)
Year FE	No	No	Yes
Industry FE	No	No	Yes
_cons	0.333**	0.291*	0.035
	(4.15)	(2.15)	(0.26)
F	13.088	2.815	6.599
r2_a	0.034	0.050	0.219
N	412	412	412

Note: t statistics in parentheses
  *p < 0.1, **p < 0.05.

4.4. Additional Analysis

To analyze further, researchers conducted tests by grouping samples into high and low institutional ownership firms based on Dong and Ozkan (2008) research. Table 6 explains the additional tests results of high and low industrial ownership. The additional test show that industries with high institutional ownership samples are significant at the 5% significance level with a coefficient value of 0.048, indicating that SMCS has a significant positive effect on ESG. While other tests with low institutional ownership samples have a coefficient value of 0.006, indicating that the results of SMCS are not significant to ESG. This means that when the company is supervised by shareholders, the company is better at supervision because the company's shareholders have the tools or infrastructure to conduct supervision. Institutional ownership is very important in reducing agency conflicts between managers and shareholders. People claim that institutional investors can effectively monitor every managerial step. This is because they do not easily believe in profit manipulation because institutional investors are involved in strategic decision-making (Berliani & Riduwan, 2017).

Table 6. Additional analysis-high or low institutional ownership.

Variables	ESG
Panel A: High institutional ownership firm	
SMCS	0.048**
	-3.37
FLEV	0
	-0.01
ATURN	0.012
	-0.61
FSIZE	0.013
	-1.58
AGROWH	-0.016
	(-0.51)
INST	-0.001
	(-1.39)
BMEET	0.006**
	-2.66
FAGE	0
	-0.09
_cons	-0.049
	(-0.20)
Year FE	Yes
Industry FE	Yes
F	5.686
r2_a	0.247
N	206
Panel B: Low institutional ownership firm	
SMCS	0.006
	-0.41
FLEV	-0.106*
	(-2.15)
ATURN	-0.009
	(-0.48)
FSIZE	0.01
	-1.33
AGROWH	0.019
	-0.81
INST	0.001*
	-1.95
BMEET	-0.004
	(-1.16)
FAGE	0.002**
	-4.1
_cons	0.166
	-0.83
Year FE	Yes
Industry FE	Yes
F	5.056
r2_a	0.253
N	206

Note: t statistics in parentheses.
$*p < 0.1$, $**p < 0.05$.

4.5. Robustness Analysis

4.5.1. Coarsened Exact Matching Method (CEM).

To validate the consistency of the results obtained in the main analysis under various conditions and maximize their use in accordance with the intended contribution, Table 7 presents the results of the CEM analysis. The CEM regression analysis in this study aims to evaluate 348 samples with appropriate characteristics, which has a difference of 64 samples compared to the main analysis. With a coefficient of 0.028 and a t-value of 2.47, it can be concluded that

SMCS has a positive relationship with ESG. These findings suggest that the positive association between SMCS and ESG is robust, supporting the results from the main analysis.

Table 7. Robustness analysis using coarsened exact matching method (CEM).

Variables	ESG
SMCS	0.028*
	(2.47)
FLEV	-0.032
	(-0.92)
ATURN	-0.005
	(-0.23)
FSIZE	0.014*
	(2.30)
AGROWTH	0.011
	(0.26)
INST	0.000*
	(1.85)
BMEET	0.001
	(0.22)
FAGE	0.001
	(1.59)
_cons	-0.058
	(-0.39)
Year FE	Yes
Industry FE	Yes
r2	0.255
r2_a	0.210
N	348

Note: t statistics in parentheses *p < 0.1.

5. DISCUSSION

The interaction between SMCS and SP is crucial for sustainable business practices. This study explores this complex relationship, revealing a positive correlation that indicates companies with strong SMCS tend to achieve higher ESG scores. Regression analysis further reinforces this idea by demonstrating a statistically significant positive impact of SMCS on ESG performance. These findings align with our predictions and support H1, consistent with the research conducted by Asiaei et al. (2022); Dharmayanti et al. (2023) and Wijethilake (2017).

Additional results tested for robustness reveal a significant positive relationship between SMCS and SP. This positive relationship may stem from the role of SMCS as a strategic control tool that guides organizations in aligning their business activities with sustainability objectives. By serving as a strategic control mechanism, SMCS helps companies integrate sustainability considerations into their decision-making processes, ensuring that sustainability becomes an integral part of business and operational strategies rather than merely a separate aspect of corporate social responsibility. Companies with weak SP tend to exhibit poor SMCS, while those with strong SP demonstrate well-structured SMCS. Strong SMCS practices can transform long-standing corporate behaviors and policies, promote long-term sustainability, minimize negative impacts on the environment and society, and create lasting value for all stakeholders.

This aligns with both stakeholder theory and the resource-based view. Stakeholder theory highlights the significance of managing relationships with all groups affected by the company's activities, including customers, employees, communities, and the environment. A robust SMCS enables companies to engage with stakeholders transparently, understand their sustainability expectations, and address their concerns. This approach fosters trust and legitimacy, which can serve as a valuable resources. The resource-based view posits that a firm's competitive advantage stems from its unique and valuable resources and capabilities. By effectively utilizing SMCS to implement and communicate sustainability practices, companies can cultivate a positive reputation and brand image, enhance

employee engagement, and attract environmentally and socially conscious customers. These factors translate into valuable intangible resources that contribute to superior sustainability performance.

The intricate relationship between SMCS and SP is further nuanced by the ownership structure of a company. Our analysis suggests that industries characterized by high institutional ownership, where a significant portion of the company is owned by investment firms, pension funds, or other institutions, exhibit a stronger connection between these two factors. High institutional ownership positively impacts sustainability performance by moderating the relationship between it and corporate performance, as seen in the study by Tristanto, Nugraha, Waspada, Mayasari, and Kurniati (2023). Conversely, low institutional ownership can negatively affect sustainability disclosure levels, as indicated by Andesto, Maftuh Ahnan, and Saebani (2022). A company's ownership structure further influences the intricate relationship between SMCS and SP. Our analysis indicates that industries with high institutional ownership—where a significant portion of the company is owned by investment firms, pension funds, or other institutions—exhibit a stronger connection between these two factors. High institutional ownership positively impacts sustainability performance by moderating the relationship between sustainability and corporate performance, as demonstrated in the study by Tristanto et al. (2023). In contrast, low institutional ownership can adversely affect sustainability disclosure levels, as noted by Andesto et al. (2022). Additionally, Alomran and Alsahali (2023) highlight that the quality of governance can moderate the relationship between long-term ownership and the reliability of companies' sustainability reporting, showing a positive and significant influence for a high level of long-term ownership. Therefore, high institutional ownership can enhance sustainability practices and reporting, leading to improved corporate performance, while low institutional ownership may hinder sustainability disclosure levels and overall sustainability performance. Institutional investors, motivated by their long-term investment horizons and commitment to sustainable practices, often prioritize ESG factors in their decision-making processes. They understand that a robust SMCS not only enhances a company's reputation and brand image but also contributes to long-term financial success by mitigating environmental and social risks, fostering stakeholder trust, and attracting environmentally conscious customers. Consequently, companies with high institutional ownership face significant pressure to implement and maintain effective SMCS in order to achieve superior SP.

This emphasis on ESG factors by institutional investors arises from several factors, including long-term investment horizons, fiduciary responsibility, and the growing demand for sustainable investment. Institutional investors typically hold investments for extended periods, making them more attuned to the long-term implications of sustainability. They recognize that companies with strong SMCS are better positioned to navigate future environmental and social challenges, ensuring sustainable growth and profitability. Additionally, institutional investors have a fiduciary duty to their clients, which entails considering ESG factors. By investing in companies with robust SMCS, they can fulfill their obligation to protect their clients' interests while contributing to a more sustainable future. The demand for sustainable investments has been steadily increasing, fueled by heightened investor awareness of the financial and societal benefits associated with ESG considerations. Institutional investors are eager to align their portfolios with this trend to meet their clients' expectations and attract new capital.

Conversely, industries with low institutional ownership, where ownership is primarily concentrated among individual investors, may not demonstrate the same strong correlation between SMCS and SP. Individual investors, often motivated by shorter-term investment horizons and placing less emphasis on ESG factors, may not exert significant pressure on companies to implement robust SMCS. Consequently, this situation could lead to companies having weak SMCS even if they achieve average SP, as there is less incentive to excel in both areas. However, it is important to note that this observation is based on preliminary findings and requires further research to fully understand the underlying dynamics.

Moreover, the influence of institutional ownership on the SMCS-SP relationship may extend beyond the direct pressure it places on companies. Institutional investors can also shape the broader ecosystem of sustainability practices by engaging with companies, industry bodies, and policymakers. They can advocate for stronger

sustainability standards, promote transparency and disclosure of ESG information, and support initiatives that enhance the effectiveness of SMCS. In this manner, institutional investors can serve as catalysts for sustainable change, encouraging companies to adopt more robust SMCS and achieve superior SP. By aligning their investment decisions with sustainability principles, institutional investors not only protect their clients' interests but also contribute to a more sustainable future for all.

6. CONCLUSION

6.1. Findings

The main objective of this study is to examine the influence of SMCS in improving sustainability performance. SMCS plays an important role in helping organizations to better align, measure, and manage social, environmental, and economic impacts so as to achieve improved corporate sustainability performance. The result of this study is that SMCS has a positive relationship with sustainability performance. SMCS enables organizations to operate in a more responsible and sustainable manner. It helps organizations minimize negative social impacts, promote positive social change, and contribute to the well-being of society and other stakeholders. It was also found that by grouping the sample based on high and low institutional ownership instruments, it was found that supervision will be better when the company is supervised by the company's shareholders because the company's shareholders have the tools or infrastructure to conduct oversight.

6.2. Policy Implications

Recommendations from this research can benefit practitioners and relevant stakeholders, both internally and externally. These suggestions can help implement company policies by enhancing understanding and developing regulations related to sustainable management control systems, thereby improving the company's sustainability performance.

6.3. Limitations

This study has several limitations. First, this study limits the sample size to companies from one country listed on the IDX, or Indonesia Stock Exchange. Second, for data availability, this study limits the research period from 2017 to 2021.

6.4. Future Research

Future research is recommended to involve a larger amount of data by expanding the research sample not only to companies listed on the IDX database but also involving all companies listed on the official websites of stock exchanges in all Asia-Pacific Economic Cooperation (APEC) member countries (Australia, Brunei Darussalam, Canada, Chile, China, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taiwan, Thailand, United States, Vietnam, Indonesia, Hong Kong, Japan, and South Korea). This is because APEC plays an important complementary role in the trade, economic, and technical cooperation agenda, helping APEC members to participate more fully and benefit from the open global trading environment. As such, it will be useful to ensure that liberalized trade contributes to sustainable growth and equitable development as well as the reduction of economic disparities. Thus, it will be useful to ensure that liberalized trade contributes to sustainable growth and equitable development as well as the reduction of economic disparities. Research also needs to consider differences in SCMS and SP practices across geographical regions, as each country has its own regulations and harmonization, so in order to avoid bias and find a more significant relationship, SCMS and SP practices in each country should be considered. Finally, data from companies that prepare sustainability reports outside the IDX database should also be included to enrich the data sample and get a more comprehensive picture. With these improvements, the research can make a stronger and more valid contribution to the development of related literature.

116

REFERENCES

Adams, C. A., Muir, S., & Hoque, Z. (2014). Measurement of sustainability performance in the public sector. *Sustainability Accounting, Management and Policy Journal*, *5*(1), 46–67. https://doi.org/10.1108/SAMPJ-04-2012-0018

Adib, M., Zhang, X., Zaid, M., & Sahyouni, A. (2021). Management control system for corporate social responsibility implementation – a stakeholder perspective. *Corporate Governance: The International Journal of Business in Society*, *21*(3), 410–432. https://doi.org/10.1108/CG-06-2020-0247

Al Hawaj, A. Y., & Buallay, A. M. (2022). A worldwide sectorial analysis of sustainability reporting and its impact on firm performance. *Journal of Sustainable Finance and Investment*, *12*(1), 62–86. https://doi.org/10.1080/20430795.2021.1903792

Alareeni, B. A., & Hamdan, A. (2020). ESG impact on performance of US S&P 500-listed firms. *Corporate Governance (Bingley)*, *20*(7), 1409–1428. https://doi.org/10.1108/CG-06-2020-0258

Alomran, A. A., & Alsahali, K. F. (2023). The role of long-term institutional ownership in sustainability report assurance: Global evidence. *Sustainability (Switzerland)*, *15*(4), 1–17. https://doi.org/10.3390/su15043492

Andansari, N. A., Raharjo, K., & Andini, R. (2016). Pengaruh return on equity (roe), price earning ratio (per), total asset turn over (tato) dan price to book value (pbv) terhadap return saham case study of food and beverage manufacturing companies listed on the idx for the 2008-2014 period. *Journal of Accounting*, *2*(2), 1–11.

Andesto, R., Maftuh Ahnan, Z., & Saebani, A. (2022). Does the owner characteristic affect sustainability disclosure and firm's performace? Empirical evidence from the Indonesia stock exchange. *Dinasti International Journal of Management Science*, *4*(1), 90–100. https://doi.org/10.31933/dijms.v4i1.1406

Asiaei, K., Bontis, N., Barani, O., Moghaddam, M., & Sidhu, J. (2022). The role of sustainability control systems in translating CSR into performance in Iran. *Management Decision*, *60*(5), 1438–1468. https://doi.org/10.1108/MD-11-2020-1510

Bansal, P. (2005). Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic Management Journal*, *26*(3), 197–218. https://doi.org/10.1002/smj.441

Barney. (1991). Firm reoruces ad sustained competitive advantege. *In Journal of Management*, *17*(1), 99–120.

Barney, J. B. (1986). Organizational culture: Can it be a source of sustained competitive advantage? *Academy of Management Review*, *11*(3), 656–665. https://doi.org/10.5465/amr.1986.4306261

Barney, J. B. (1995). Looking inside for competitive advantage. *Academy of Management Perspectives*, *9*(4), 49–61. https://doi.org/10.5465/ame.1995.9512032192

Bassen, A., & Kovács, A. M. (2008). Environmental, social and governance key performance indicators from a capital market perspective. *Zeitschrift für Wirtschafts- und Unternehmensethik*, *9*(2), 182–193.

Berliani, C., & Riduwan, A. (2017). The influence of good corporate governance, financial performance, and company size on company value. *Jurnal Ilmu Dan Riset Akuntansi*, *6*(3), 1037–1051.

Beusch, P., Frisk, J. E., Rosén, M., & Dilla, W. (2022). Management control for sustainability: Towards integrated systems. *Management Accounting Research*, *54*, 100777. https://doi.org/https://doi.org/10.1016/j.mar.2021.100777

Bogodistov, Y., & Wohlgemuth, V. (2017). Enterprise risk management: A capability-based perspective. *Journal of Risk Finance*, *18*(3), 234–251. https://doi.org/10.1108/JRF-10-2016-0131

Brick, I. E., & Chidambaran, N. K. (2010). Board meetings, committee structure, and firm value. *Journal of Corporate Finance*, *16*(4), 533–553. https://doi.org/10.1016/j.jcorpfin.2010.06.003

Chariri, A., & Ghozali, I. (2007). *Accounting theory*. Semarang: Badan Penerbit UNDIP.

Cheng, M. M., Green, W. J., & Ko, J. C. (2015). The impact of strategic relevance and assurance of sustainability indicators on investors' decisions. *Auditing: A Journal of Practice & Theory, 34*(1), 131-162.

Corsi, K., & Arru, B. (2020). Role and implementation of sustainability management control tools: Critical aspects in the Italian context. *Accounting, Auditing and Accountability Journal, 34*(9), 29–56. https://doi.org/10.1108/AAAJ-02-2019-3887

Crutzen, N., Zvezdov, D., & Schaltegger, S. (2017). Sustainability and management control exploring and theorizing control patterns in large European firms. *Journal of Cleaner Production, 143*, 1291–1301. https://doi.org/10.1016/j.jclepro.2016.11.135

De Villiers, C., & Maroun, W. (2018). *Sustainability accounting and integrated reporting* (1st ed.). London ; New York: Routledge.

Dharmayanti, N., Ismail, T., Hanifah, I. A., & Taqi, M. (2023). Exploring sustainability management control system and eco-innovation matter sustainable financial performance: The role of supply chain management and digital adaptability in Indonesian context. *Journal of Open Innovation: Technology, Market, and Complexity, 9*(3), 100119. https://doi.org/10.1016/j.joitmc.2023.100119

Dhasmana, S., Ghosh, S., & Kanjilal, K. (2023). Does investor sentiment influence ESG stock performance? Evidence from India. *Journal of Behavioral and Experimental Finance*(37). https://doi.org/10.1016/j.jbef.2023.100789

Ditillo, A., & Lisi, I. E. (2014). Towards a more comprehensive framework for sustainability control systems research. *Advances in Environmental Accounting and Management, 5*, 23–47. https://doi.org/10.1108/S1479-359820140000005010

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review, 20*(1), 65-91. https://doi.org/10.2307/258887

Dong, M., & Ozkan, A. (2008). Institutional investors and director pay: An empirical study of UK companies. *Journal of Multinational Financial Management, 18*(1), 16–29. https://doi.org/10.1016/j.mulfin.2007.06.001

Durden, C. (2008). Towards a socially responsible management control system. *Accounting, Auditing and Accountability Journal, 21*(5), 671–694. https://doi.org/10.1108/09513570810872969

Eldridge, S., van Iwaarden, J., van der Wiele, T., & Williams, R. (2013). Management control systems for business processes in uncertain environments. *International Journal of Quality & Reliability Management, 31*(1), 66–81.

Epstein, M. J., & Roy, M.-J. (2001). Sustainability in action: Identifying and measuring the key performance drivers. *Long Range Planning, 34*(5), 585-604. https://doi.org/10.1016/S0024-6301(01)00084-X

Erin, O., Adegboye, A., & Bamigboye, O. A. (2022). Corporate governance and sustainability reporting quality: Evidence from Nigeria. *Sustainability Accounting, Management and Policy Journal, 13*(3), 680–707. https://doi.org/10.1108/SAMPJ-06-2020-0185

Fazzini, M., & Dal Maso, L. (2016). The value relevance of "assured" environmental disclosure: The Italian experience. *Sustainability Accounting, Management and Policy Journal, 7*(2), 225–245. https://doi.org/10.1108/SAMPJ-10-2014-0060

Felício, T., Samagaio, A., & Rodrigues, R. (2021). Adoption of management control systems and performance in public sector organizations. *Journal of Business Research, 124*, 593–602. https://doi.org/10.1016/j.jbusres.2020.10.069

Figge, F., Hahn, T., Schaltegger, S., & Wagner, M. (2002). The sustainability balanced scorecard - Linking sustainability management to business strategy. *Business Strategy and the Environment, 11*(5), 269–284. https://doi.org/10.1002/bse.339

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston: Pitman.

Gond, J.-P., Grubnic, S., Herzig, C., & Moon, J. (2012). Configuring management control systems: Theorizing the integration of strategy and sustainability. *Management Accounting Research, 23*(3), 205-223. https://doi.org/10.1016/j.mar.2012.06.003

Gonzalez, J. M. G., & Ramírez, C. Z. (2016). Organisational communication on climate change. *International Journal of Climate Change Strategies and Management, 8*(2), 286-316. https://doi.org/10.1108/IJCCSM-10-2014-0126

Harymawan, I., Nasih, M., Agustia, D., Ratri, M. C., & Nowland, J. (2020). CEO & CFO education and R&D investment in Indonesia. *Australasian Accounting, Business and Finance Journal, 4*(2), 16-34. https://doi.org/10.14453/aabfj.v14i2.3

Henri, J.-F., & Journeault, M. (2010). Eco-control: The influence of management control systems on environmental and economic performance. *Accounting, Organizations and Society, 35*(1), 63-80. https://doi.org/10.1016/j.aos.2009.02.001

Hou, F., Liu, J., Pang, T., & Xiong, H. (2020). Signing auditors' foreign experience and audit pricing. *Economic Modelling*, *91*, 300-312. https://doi.org/10.1016/j.econmod.2020.06.014

Ittner, C. D., & Larcker, D. F. (2001). Assessing empirical research in managerial accounting: A value-based management perspective. *Journal of Accounting and Economics*, *32*(1-3), 349-410. https://doi.org/10.1016/s0165-4101(01)00026-x

Jutidharabongse, J., Imjai, N., Pantaruk, S., Surbakti, L. P., & Aujirapongpan, S. (2024). Exploring the effect of management control systems on dynamic capabilities and sustainability performance: The role of open innovation strategy amidst COVID-19. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1), 100224. https://doi.org/10.1016/j.joitmc.2024.100224

Kazemian, S., Djajadikerta, H. G., Trireksani, T., Sohag, K., Sanusi, Z. M., & Said, J. (2022). Carbon management accounting (CMA) practices in Australia's high carbon-emission industries. *Sustainability Accounting, Management and Policy Journal*, *13*(5), 1132-1168. https://doi.org/10.1108/SAMPJ-05-2021-0174

Kend, M. (2015). Governance, firm-level characteristics and their impact on the client's voluntary sustainability disclosures and assurance decisions. *Sustainability Accounting, Management and Policy Journal*, *6*(1), 54-78. https://doi.org/10.1108/SAMPJ-12-2013-0061

KPMG. (2015). *The KPMG survey of corporateresponsibility reporting*. Retrieved from www.kpmg.com/crreporting

Latan, H., Noonan, R., & Matthews, L. (2017). *Partial least squares path modeling. In Partial least squares path modeling: Basic concepts, methodological issues and applications*: Springer. https://doi.org/10.1007/978-3-319-64069-3.

Lueg, R., & Radlach, R. (2016). Managing sustainable development with management control systems: A literature review. *European Management Journal*, *34*(2), 158-171. https://doi.org/10.1016/j.emj.2015.11.005

Luo, X., Wang, H., Raithel, S., & Zheng, Q. (2015). Corporate social performance, analyst stock recommendations, and firm future returns. *Strategic Management Journal*, *36*(1), 123-136. https://doi.org/10.1002/smj.2219

Maas, K., Schaltegger, S., & Crutzen, N. (2016). Integrating corporate sustainability assessment, management accounting, control, and reporting. *Journal of Cleaner Production*, *136*, 237-248. https://doi.org/10.1016/j.jclepro.2016.05.008

Nani, D. A., & Safitri, V. A. D. (2021). Exploring the relationship between formal management control systems, organisational performance and innovation: The role of leadership characteristics. *Asian Journal of Business and Accounting*, *14*(1), 207-224. https://doi.org/10.22452/ajba.vol14no1.8

Nicolas, C., Müller, J., & Arroyo-Cañada, F. J. (2021). A fuzzy inference system for management control tools. *Mathematics*, *9*(17), 1–19. https://doi.org/10.3390/math9172145

Oduro, S., & Haylemariam, L. G. (2019). Market orientation, CSR and financial and marketing performance in manufacturing firms in Ghana and Ethiopia. *Sustainability Accounting, Management and Policy Journal*, *10*(3), 398-426. https://doi.org/10.1108/SAMPJ-11-2018-0309

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

Rachman, N. M., Efendi, A., & Wicaksana, E. (2011). *Complete guide to CSR planning*. Jakarta: Penebar Swadaya Grup.

Rehman, S. U., Bhatti, A., Kraus, S., & Ferreira, J. J. (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

Riccaboni, A., & Leone, E. L. (2010). Implementing strategies through management control systems: The case of sustainability. *International Journal of Productivity and Performance Management*, *59*(2), 130-144. https://doi.org/10.1108/17410401011014221

Santoso, S. (2017). *Mastering statistics with SPSS 24*. Jakarta: PT: Elex Media Komputindo.

Schaltegger, S., & Csutora, M. (2012). Carbon accounting for sustainability and management. Status quo and challenges. *Journal of Cleaner Production*, *36*, 1-16. https://doi.org/10.1016/j.jclepro.2012.06.024

Setiyawan, A., Ismail, T., Muchlish, M., & Indriana, I. (2024). The effect of management control systems on business performance and innovation organizational as moderating and mediating variable. *Decision Science Letters, 13*(1), 143-152. https://doi.org/10.5267/j.dsl.2023.11.001

Shumway, T. (2001). Forecasting bankruptcy more accurately: A simple hazard model. *The Journal of Business, 74*(1), 101–124.

Tjahjadi, B., Soewarno, N., Nadyaningrum, V., & Aminy, A. (2022). Human capital readiness and global market orientation in Indonesian micro-, small-and-medium-sized enterprises business performance. *International Journal of Productivity and Performance Management, 71*(1), 79-99. https://doi.org/10.1108/IJPPM-04-2020-0181

Tristanto, T. A., Nugraha, N., Waspada, I., Mayasari, M., & Kurniati, P. S. (2023). Sustainability performance impact of corporate performance in Indonesia banking. *Journal of Eastern European and Central Asian Research, 10*(4), 668-678. https://doi.org/10.15549/jeecar.v10i4.1364

Wang, N., Pan, H., Feng, Y., & Du, S. (2023). How do ESG practices create value for businesses? Research review and prospects. *Sustainability Accounting, Management and Policy Journal*(ahead-of-print). https://doi.org/10.1108/SAMPJ-12-2021-0515

Wijethilake, C. (2017). Proactive sustainability strategy and corporate sustainability performance: The mediating effect of sustainability control systems. *Journal of Environmental Management, 196,* 569-582. https://doi.org/10.1016/j.jenvman.2017.03.057

Yu, E. P.-y., Van Luu, B., & Chen, C. H. (2020). Greenwashing in environmental, social and governance disclosures. *Research in International Business and Finance, 52,* 101192. https://doi.org/10.1016/j.ribaf.2020.101192