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Linking PMS sophistication to sustainability performance: the mediating role of sustainability orientation

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Abstract

Purpose – The purpose of this study is to focus on the relationships among the sophistication level of performance measurement systems (PMSs), sustainability orientation and sustainability performance.

Design/methodology/approach – Data from 207 small- and medium-sized enterprises (SMEs) across distinct industries were collected using a structured survey questionnaire.

Findings – The results of this study show that a higher level of PMS sophistication is positively related to sustainability orientation, which in turn affects sustainability performance. Thus, this study provides evidence that an orientation toward sustainability mediates the connection between PMS sophistication level and sustainability performance. This finding of this study suggests that PMS sophistication alone is insufficient. Sustainability benefits are more likely when PMSs are substantively used to inform decisions and trigger concrete actions.

Originality/value – While an orientation toward sustainability has been encouraged in prior research, comparatively limited research has focused on PMS sophistication level that underlies the execution of target-oriented activities and, hence, provides the potential for sustainability. The results of the current study enrich the understanding of managerial means (i.e. PMSs) and the implications underlying the enhancement of SMEs' sustainability orientations.

Keywords Performance measurement system, Sustainable development, Sustainability orientation, Sustainability performance

Paper type Research paper

1. Introduction

For decades, a growing stream of research has investigated the positive role of sustainability orientation in enhancing firm performance (Danso *et al.*, 2019). Sustainability orientation refers to the reconfiguration of a company's processes, structure and actions to decrease the negative influence of its operation on the environment (Khizar *et al.*, 2022). As companies' sustainability orientation demonstrates their moral behavior and results in higher performance (Khizar *et al.*, 2022), they attempt to align their economic objectives with the

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social and environmental aspects of sustainability (Danso *et al.*, 2019). Previous studies have indicated that under certain conditions, sustainability orientation affects sustainability performance (Kautonen *et al.*, 2020). However, research has not found a clear answer regarding *how* sustainability orientation improves firm performance or what factors might play a role in this process.

According to one stream of research, the conditions under which sustainability orientation leads to greater performance seem to be related to the degree to which managerial control systems combine environmental and social objectives and performance metrics with financial objectives (Gond *et al.*, 2012; Bastini *et al.*, 2022). Performance measurement systems (PMSs), defined here as systems that include financial and nonfinancial performance metrics and are used for the operationalization of an organization's strategic objectives, are considered one of the most important managerial control systems in organizations (Otley, 1999; Merchant and Van der Stede, 2007). In the sustainability domain, PMSs can direct managers to focus on the most important issues and enhance their motivation to accomplish organizational objectives (Asiaei *et al.*, 2022).

Despite advancements in PMS–sustainability research, recent studies (Imbrogiano and Nichols, 2021; Gebhardt *et al.*, 2023) have highlighted the lack of research on the possible ways to create sustainability performance, especially in small- and medium-sized enterprises (SMEs) (Luederitz *et al.*, 2021; Hasu *et al.*, 2025). In other words, the role of PMSs in the relationship between sustainability orientation and sustainability performance has not yet been clarified. While an orientation toward sustainability has been encouraged in prior research, comparatively limited research has focused on the role of PMS sophistication level in enabling sustainability performance (Mio *et al.*, 2022; Buonasera *et al.*, 2025). Sophistication refers to the depth of the system, such as the mix of different types of metrics or detailed cause–effect relationships.

The current study aims to examine the connections among PMS sophistication level, orientation toward sustainability and sustainability performance. Specifically, we examine the direct and indirect influences of PMS sophistication level and sustainability orientation to disentangle how these factors contribute to sustainability performance. Thus, the focus of the study is on PMS design sophistication, not on PMS use. This study builds on a survey of 207 SMEs to extend the existing research by investigating not only the influence of PMS sophistication level on sustainability performance but also how PMS sophistication level relates to organizational orientation toward sustainability in SMEs. Specifically, we test a model positing that sustainability orientation plays a significant role in mediating the connection between PMS sophistication level and sustainability performance.

We focus on Finland, which is interesting from a sustainability perspective because of the high levels of sustainability initiatives implemented in companies of all sizes. Especially for SMEs, finding a competitive advantage in the sustainability domain is an attractive path for future businesses. SMEs work with tight budgets and uneven management practices. These limitations make a well-designed PMS critical because it helps firms turn sustainability goals into measurable results. SMEs also play a central role in the Finnish economy. However, research has rarely examined how their PMSs connect managers' sustainability priorities with observed outcomes. Thus, studying this topic among Finnish SMEs allows us to obtain insights into the influence of sophisticated PMSs on sustainability.

The remainder of this paper is structured as follows. The theoretical background is explained in Section 2, followed by a presentation of our hypothesis development process and research model in Section 3. The research methodology is described in Section 4, and the results of the statistical data analysis are presented in Section 5. Finally, the implications for theory and practice, as well as the research limitations and future research directions, are detailed in Section 6.

2. Theoretical background

2.1 Sustainability orientation

We build on the resource-based view (RBV) (Barney, 1991) as a conceptual rationale for studying the influence of sophisticated PMSs and sustainability orientations on organizational outcomes. The RBV builds on the premise that organizations use their unique resources (organizational, human and physical) to obtain competitive advantage (Barney, 1991; Teece *et al.*, 1997). This undertaking requires the strategic intent of an organization's management to emphasize practices that assist in achieving desired organizational outcomes. Sustainability has been suggested as one of the most prominent strategic practices for achieving this goal (Hong *et al.*, 2019; Chenhall *et al.*, 2017). In SMEs, sustainability embedded in organizational processes is often socially complex and difficult to imitate, even if individual practices are observable. The RBV deals with companies' internal strengths and weaknesses and has been considered a prominent theoretical base to examine the trade-off between balancing economic goals and the pressure to implement sustainability initiatives (Galbreath, 2019; Khanra *et al.*, 2022). When an organization engages in sustainable activities at a high level, its orientation toward sustainability is imposed on its employees, thus allowing for a wide focus on or the deployment of sustainable actions and procedures (Croom *et al.*, 2018). Managing sustainability involves determining sustainability objectives and navigating their complexities (Wilhelm *et al.*, 2016).

We build on the concept of sustainability orientation to characterize the organizational principles, behaviors and cultures that make organizations adopt a range of sustainability initiatives in their activities (Cheng, 2020). Sustainability orientation, which describes the managerial attitude and belief that organizations should contribute value to social and environmental issues, has been used in several research areas, such as marketing, entrepreneurship, stakeholder theory and corporate environment (Kautonen *et al.*, 2020; Croom *et al.*, 2018). In this study, the term "sustainability orientation" refers to the level at which organizations adopt the following distinct approaches toward sustainable production: designing products with materials that support reuse, recycling and recovery principles; designing products with environmentally friendly materials; and working to reduce waste from organizational activities (Blome *et al.*, 2014). These factors are important determinants of sustainability performance.

2.2 Sustainability performance

Our definition of sustainability performance builds on the revolutionary report of Brundtland *et al.* (1987), which refers to sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." A three-dimensional typology comprising environmental, social and economic aspects has also been introduced for sustainability. However, the economic dimension views benefits in terms of monetary capital; that is, it lacks the power to explain the benefits of intangible resources and natural capital (Goodland, 1995). Thus, a triple bottom line typology was formed to acknowledge other types of capital (environmental and social) (Elkington, 1997, 2004). The environmental dimension covers the means of reducing the negative environmental impacts of firm operations, while the social dimension covers the well-being of organizations and people. This triple bottom line definition has been widely used in the fields of accounting and performance management, where the focus of sustainability performance is on the level at which economic, environmental and social dimensions are embraced in firm operations (Artiach *et al.*, 2010; Thoradeniya *et al.*, 2021; Maine *et al.*, 2022).

Thus, by concentrating on the economic, environmental and social dimensions, this study enhances the understanding of the relationships between firms and the environments in which they operate. Nevertheless, when building on the RBV, firm capabilities may not contribute directly to enhanced sustainability performance; preferably, these sustainability resources will drive actions that foster resources, and in this way, they will enhance competitiveness, again improving performance (Bastini *et al.*, 2022). Thus, sustainability performance is an outcome of sustainability orientation, but it may require a set of firm practices that reinforce the ability to govern sustainability and drive enhanced performance.

2.3 Performance measurement system sophistication level

Performance management and measurement (PMM) refers to an array of managerial processes that are promoted and adjusted using distinct tools and initiatives (e.g. scorecards, measurements, objectives, performance reviews and rewards) that are constructed centrally and disseminated organization wide (Bourne *et al.*, 2018b; Malmi and Brown, 2008; Franco-Santos *et al.*, 2007) Given the transformations of these tools and initiatives, the theoretical underpinnings of PMM are mostly rooted in the research stream of control systems (Bourne *et al.*, 2018a). Traditionally, PMM has been approached from an accounting and cost perspective that highlights financial performance measurements (Nudurupati *et al.*, 2011; Gutierrez *et al.*, 2015). PMM uses PMSs, which consist of measures used to quantify an organization's activities and thus describe the organization's performance (Neely *et al.*, 1995).

Thus, this study defines PMSs as systems that include financial and nonfinancial performance metrics and are used for the operationalization of organizations' strategic objectives (Franco-Santos *et al.*, 2012; Guenther and Heinicke, 2019). PMSs are crucial for advancing the effectiveness and efficiency of organizations (Bourne *et al.*, 2018b). Ideally, a firm's PMS should be aligned with both internal and external conditions and adjusted for the organization-specific purposes of PMM (Goshu and Kitaw, 2017; Melnyk *et al.*, 2014). PMS design differs across firms and industries, and the levels of sophistication among PMSs can be used to capture these differences (Guenther and Heinicke, 2019). The term "PMS sophistication level" was used by Guenther and Heinicke (2019) to describe the technical quality of PMSs' design features. This definition of PMS sophistication level is based on the frameworks of Speckbacher *et al.* (2003) and Franco-Santos *et al.* (2012).

The key differences across PMS sophistication levels are the variations in PMS linkage to strategy, variations in the cause-and-effect relationships through which strategies are described and variations in the connections between performance and reward systems (Speckbacher *et al.*, 2003; Franco-Santos *et al.*, 2012; Guenther and Heinicke, 2019). According to Speckbacher *et al.* (2003), PMSs may evolve over time; thus, researchers should regularly reassess firms' PMS sophistication levels, as PMS contents, implementation processes and PMS value can fluctuate based on that evolution. Therefore, a continuous assessment of PMS sophistication level, defined as the level of crucial design characteristics of a particular PMS within an organization, should be used to master variance in sustainability orientation (Guenther and Heinicke, 2019). Next, we discuss the development of specific hypotheses.

3. Hypothesis development

3.1 Sustainability implications of sophisticated performance measurement systems

Different factors contribute to the success or failure of PMS, and they include system maturity; management style; information and communication systems; and organizational behavior, culture, size and structure (Franco and Bourne, 2003; Bititci *et al.*, 2012). In

addition, PMSs are formed by the ideas, beliefs and values of organizations, people and societies that work together (Franco and Bourne, 2003; Bititci *et al.*, 2012; Chenhall *et al.*, 2017). According to De Leeuw and Van Den Berg (2011), the use of a PMS results in the execution of certain behaviors, and "understanding," "motivation" and "focus on improvement" are three elements that can affect individuals' behaviors. By leveraging these three elements in PMS and thereby influencing individuals' behavior, managers can achieve their desired outcomes based on the firm's existing orientation. Thus, because PMSs can improve communication in a way that enables an organization's performance to be defined based on its goals and mission (Magretta and Stone, 2002), the role of PMSs to support sustainability is relevant (Asiaei *et al.*, 2021; Cavicchi and Vagnoni, 2021).

Several studies have confirmed that the appropriate PMSs may help companies meet their sustainability objectives (Gond *et al.*, 2012; Baumgartner, 2014; Hahn and Figge, 2018; Asiaei *et al.*, 2021; Mio *et al.*, 2022; Gebhardt *et al.*, 2023). Within the flow of information provided, a PMS can be considered as a learning system and opportunity for knowledge sharing that informs staff members about the gaps between current and desired performance levels, as well as the status of the company and upcoming opportunities for improvement (Garengo *et al.*, 2005; Franco-Santos *et al.*, 2007; Bititci *et al.*, 2012), which, in this case, is the improvement of sustainability performance. For example, Asiaei *et al.* (2021) found that integrating sustainability into a PMS enhances company performance, whereas Hasu *et al.* (2025) found that the diagnostic use of management control systems affects sustainability performance. Thus, a more sophisticated PMS should enhance sustainability performance because it provides richer and more accurate sustainability information. These features help managers monitor environmental and social impacts more effectively. Such benefit could be a consequence of the way in which PMSs facilitate the transfer of the information needed to endorse sustainability throughout the processes of a given firm (Cavicchi and Vagnoni, 2021). Thus, we hypothesize the following:

H1. Performance measurement system sophistication level is positively associated with sustainability performance.

According to Koufteros *et al.* (2014), performance measures can be used for different purposes, but regardless of their function, PMSs should adapt to the environments in which they operate (Nudurupati *et al.*, 2011; Bititci *et al.*, 2012; Bourne *et al.*, 2018b). Thus, in addition to facilitating sustainability performance, PMSs can help enhance companies' overall orientation toward sustainability. After all, PMSs have been proposed to facilitate the meeting of a variety of sustainability management demands, such as sustainability strategy implementation, sustainability standard utilization, decision-making and reporting, stakeholder engagement and promotion of employee engagement in sustainability (Epstein and Wisner, 2001; Schaltegger and Wagner, 2006). Thus, this literature review confirms the important role of PMSs in facilitating organizations' processes, structure and actions related to sustainability, all of which relate to these organizations' overall orientation toward sustainability. According to Mio *et al.* (2022), a PMS is a broad process that begins with sustainability strategies and initiatives that lead to the integration of sustainability within a company's strategy. Thus, a sophisticated PMS can also increase the visibility of sustainability issues across organizations. It further supports planning, control and learning processes. Managers can then allocate resources more effectively and track progress toward sustainability goals. Thus, we hypothesize that sophisticated PMSs play a significant role in facilitating not only sustainability performance but also the overall orientation toward sustainability:

H2. Performance measurement system sophistication level is positively associated with sustainability orientation.

3.2 Sustainability orientation and sustainability performance

Recent studies have demonstrated the importance of managerial controls in building sustainability (Hasu *et al.*, 2025). Wijethilake and Upadhaya (2020) argued that the interactive use of managerial controls strengthens sustainability learning capabilities. They also help firms integrate sustainability into their daily operations more effectively. Beusch *et al.* (2022) showed that intensive dialogue across managerial levels and functions can reduce technical and organizational barriers. These discussions support sustainability integration across value chains. The PMS is among these managerial controls. A sophisticated PMS is likely to improve sustainability performance indirectly by strengthening an organization's sustainability orientation. More advanced systems can provide broader and more detailed sustainability information. This information focuses on managerial attention and reinforces sustainability as a strategic priority.

Thus, sustainability orientation, which concerns whether an organization's culture, principles and behaviors support sustainability-related initiatives, plays an important role in attaining sustainability performance. Sustainability orientation facilitates companies' commitment to outstanding sustainable actions (Chen, 2020). Previous research has revealed that sustainability orientation can result in improvements in various types of performance (e.g. Schrettle *et al.*, 2014; Abdul-Rashid *et al.*, 2017; Soytas *et al.*, 2019). For example, Longoni and Cagliano (2016) studied the internal and external benefits of sustainability practices. They found that green operations (consuming few natural resources) and social operations (enhancing working conditions, health and safety) have different performance outcomes. Green operations help produce external benefits for customers, whereas social operations help produce internal benefits for employees. In turn, internal benefits influence external benefits (Longoni and Cagliano, 2016). Abdul-Rashid *et al.* (2017) extended the study of manufacturing organizations' sustainable practices and found that these practices enhance manufacturers' environmental and social performance, as well as their economic viability. Similarly, Pullman *et al.* (2009) examined the implications of environmental and social sustainability practices. They found that two environmental sustainability practices, namely, conservation and land management, influences environmental performance, which in turn affects cost performance through quality. Soytas *et al.* (2019) found that organizations that implement sustainability initiatives achieve higher financial performance than organizations that do not. However, evidence suggests a threshold beyond which sustainability efforts do not necessarily yield a return; sustainability efforts result in higher efficiency and resource savings, but eventually, additional costs exceed the benefits gained (Schrettle *et al.*, 2014). In this sense, we believe that a sustainability orientation assists management in targeting company efforts to achieve measurable outputs and is thus considered a determinant of sustainability performance. Thus, PMS sophistication may contribute to sustainability outcomes mainly by shaping sustainability orientation rather than through a direct effect. Thus, we propose the following:

H3. Performance measurement system sophistication level is positively associated with sustainability performance through sustainability orientation.

We argue that a sophisticated PMS implemented in the context of sustainability enables learning about sustainability processes. It then results in an understanding of the current state of sustainability and strengthens a firm's orientation toward sustainability, thus facilitating

sustainability performance. Hence, the existence of a sustainability orientation likely mediates the relationship between PMS sophistication level and sustainability performance. Based on the literature discussed previously and summarized in Table 1, the research model illustrated in Figure 1 is proposed. The first two hypotheses address direct effects (the effects of PMS sophistication level), whereas the third hypothesis focuses on mediating effects (the mediating effect of sustainability orientation). These hypotheses are proposed to examine whether PMS sophistication level or, alternatively, the mediating effect of sustainability orientation, is crucial to sustainability performance.

4. Methodology

4.1 Sampling and data collection

To test the hypotheses, we administered an online survey to Finnish companies located in the Päijät-Häme region. The collected data included SME managers' perceptions of the issues studied. We selected Finnish companies because they fall under the European Union's (EU) corporate social responsibility directive and are subject to common EU regulations. To avoid self-selection bias, we used a two-phase sample selection (Lohr, 2010), which also allowed us to obtain a broad view of the companies operating in the area. In the first phase, we used the database of a service provider and randomly targeted SMEs that fell within the scope of the EU definition. The questionnaire was sent to 1,860 company representatives.

We used a mixed survey method to collect the data (Dillman *et al.*, 2014). First, company representatives were invited to respond to the survey via email. Phone calls were subsequently made because relying solely on emails might cause self-selection bias, as the voluntary nature of email-based data collection might attract only proactive organizations (Lohr, 2010). The survey data were collected in May 2022. The company representatives were assured of the full confidentiality and anonymity of their responses. The respondents could also obtain the results of the study if they wished. The final number of responses received was 207 (11%). The sample consisted of company managers and people familiar with sustainability-related actions within the companies. This study's execution and phases are illustrated in Figure 2.

The respondents represented SMEs, with 72.5% having fewer than 10 employees (micro-sized), 21.7% having 10–49 employees (small-sized) and 5.8% having 50 or more employees (medium-sized). The large share of microenterprises reflects the actual structure of the regional SME population. Approximately 71.5% of the companies operated mainly in the service industry, 14.5% operated mainly in the manufacturing industry and 14% operated in both industries. The majority of the respondents represented top management (n = 188) while the rest represented middle management and employees.

4.2 Measures

Reflective measurement suits coherent latent phenomena, such as perceived PMS sophistication, sustainability orientation and sustainability performance, in which a latent trait drives the observed indicators. These measures are discussed in the following section.

4.2.1 Measurement of performance measurement system sophistication level. To measure PMS sophistication level, we developed four items based on the study of Guenther and Heinicke (2019). We requested the informants to report the extent to which they agreed with the following items concerning their companies' PMSs: the PMS combines nonfinancial and financial performance measures, the PMS describes strategy by using cause-and-effect relations, the PMS determines target ranks and plans for action and the PMS relates to rewards for management compensation. The items were constructed to measure informants' consensus on a five-point Likert scale, with scores ranging from 1

Table 1. Summary of previous literature

Literature theme	Summary of previous literature	References	Research gap	Implications for the present study
PMS sophistication level	Appropriate PMS use assists companies in meeting sustainability objectives by serving as a learning system, sharing knowledge and informing staff about performance gaps and improvement opportunities	Gond *et al.* (2012), Baumgartner (2014), Hahn and Figge (2018), Asaei *et al.* (2021) and Mio *et al.* (2022)	PMS sophistication level has the potential to facilitate meeting sustainability objectives, but evidence is limited with regard to whether meeting objectives is realized as actual performance	Studying whether PMS sophistication level is positively associated with sustainability performance (*H1*)
	Appropriate PMS use enhances a company's appreciation toward sustainability initiatives	Epstein and Wisner (2001), Schaltegger and Wagner (2006), Cavicchi and Vagnoni (2021) and Mio *et al.* (2022)	PMS sophistication level has the potential to endorse company sustainability, but evidence is limited with regard to whether endorsement is realized via actual orientation toward sustainability	Studying whether PMS sophistication level is positively associated with sustainability orientation (*H2*)
PMS sophistication level and sustainability orientation	Integrating sustainability into PMSs enhances company performance, possibly because of the facilitation of information transfer necessary for sustainability across processes	Cavicchi and Vagnoni (2022)	Higher sustainability performance is more likely when an organization is sustainably oriented, but the role that PMS sophistication level plays in facilitating both requires further research	Studying whether sustainability orientation mediates the connection between PMS sophistication level and sustainability performance (*H3*)
	Sustainability orientation, encompassing company processes and behaviors supporting various sustainability-related initiatives, is vital for sustainability performance	Schrettle *et al.* (2014), Abdul-Rashid *et al.* (2017) and Soytas *et al.* (2019)		

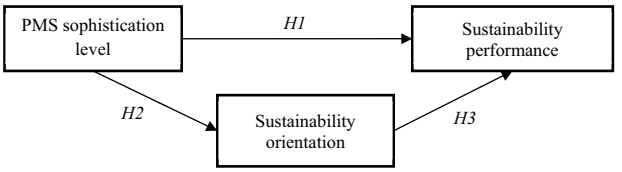

Figure 1. Research model

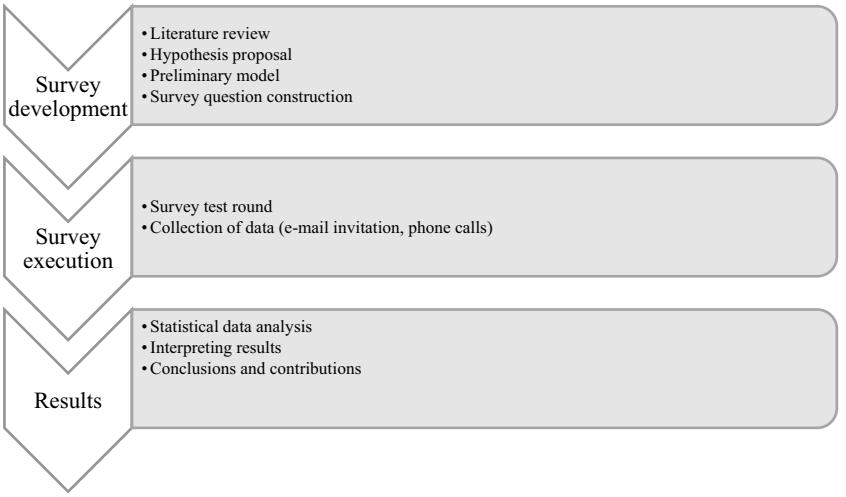

Figure 2. Study execution and phase

("strongly disagree") to 5 ("strongly agree"). The reliability and validity of the construct were confirmed for PMS, as the α and composite reliability (CR) values were greater than 0.7, and the average variance extracted (AVE) value was greater than 0.5 (Fornell and Larcker, 1981).

4.2.2 Measurement of sustainability orientation. To measure sustainability orientation, we relied on four items adopted from Blome *et al.* (2014). The informants were asked to share their perceptions regarding the extent to which their respective companies do the following: focus on reusing, recycling and/or recovering materials; design their products to use environmentally friendly materials; use life cycle analysis to assess the environmental implications of their products; and evaluate their current processes to decrease their effects on the environment. The items were constructed to measure informants' consensus on a five-point Likert scale, with scores ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The reliability and validity of the construct were confirmed for sustainability orientation, as the α and CR values were greater than 0.7, while the AVE value was greater than 0.5 (Fornell and Larcker, 1981).

4.2.3 Sustainability performance. Objective performance data are rarely available for small firms, and prior studies have used subjective measures. To measure sustainability performance, we relied on three questions informed by the triple bottom line definition of Elkington (1997) and revised them to broaden their applicability to corporate sustainability.

In particular, we asked the respondents to compare their companies' environmental, social and economic sustainability with that of their competitors. As sustainability is a complicated and broad topic, we addressed a variety of organizational settings and created descriptions for the three dimensions, thereby facilitating the reliability of the answers by ensuring that the respondents understood the concepts similarly. The items used were designed to measure informants' consensus on a four-point Likert scale, with scores ranging from 1 ("weak") to 4 ("excellent"). The reliability and validity of the construct were confirmed for sustainability performance, as the CR value was greater than 0.7, while the AVE value was greater than 0.5 (Fornell and Larcker, 1981).

4.2.4 Control variables. Three control variables were used to measure variability in sustainability performance: company size (natural logarithm of number of employees), competition in the market during the past three years (assessed on a scale of 1 ["not at all strong"] to 4 ["very strong"]) and mark predictability during the past three years (assessed on a scale of 1 ["much easier to predict"] to 4 ["much harder to predict"]). Using company size as a control variable (Henri and Journeault, 2010; Lisi, 2015) can help identify SME-perceived sustainability pressures from different stakeholders (Dowling and Pfeffer, 1975). We also controlled for competition and predictability in the markets, as they can affect the extent to which a company is capable of pursuing sustainability. The three control variables were included in the hypothesized structural equation model (SEM) to assess the robustness of the results. Table 2 depicts the measurement instruments that encompass the constructs, items, standard weight and the α, CR and AVE values of this study variables.

4.3 Bias

Before testing our hypotheses, we conducted tests to assess potential nonresponse and common method biases. To identify potential nonresponse bias, we cross-checked the respondents who answered within one week of the first mailing of the survey and those who answered on the last week before the survey was closed by using an analysis of variance test in terms of all items of PMS sophistication level, sustainability orientation and sustainability performance (Armstrong and Overton, 1977). The answers of the early and late respondents were not statistically significantly different (at the 1% significance level).

The response rates for online surveys have decreased over time, thus making a response rate of 11% acceptable (Merchant and Van der Stede, 2007). This study was conducted using the various procedural and statistical measures suggested by Podsakoff *et al.* (2003) to preclude potential common method bias. From the outset, clear instructions, distinct sections for different items and the full anonymity of the participants' responses were ensured. We used four- and five-point Likert scales for every item and elucidated the previously used items by using their simplest form and validated items. To test for common method variance bias, we performed an ex-post one-factor test (Podsakoff and Organ, 1986). The recommended unrotated factor structure revealed a three-factor solution, with the first factor accounting for 30.8% of the variance. Thus, because a one-factor solution did not emerge and the first factor did not account for more than half of the variance, common method variance bias was unlikely to be a severe threat.

5. Results

5.1 Measurement model assessment

The results of the research framework verification and hypothesis testing were based on the SEM. The exogenous variable of the research framework was PMS sophistication level, and

Table 2. Survey instrument reliability and validity

Construct	Items	Scale	References	CR	AVE	α
Sustainability orientation	When designing offering, we pay attention to the reuse, recycling and/or recovery of materials We design our offering using environmentally friendly materials We use life cycle analysis to evaluate the environmental impacts of our offering We evaluate our existing processes to reduce their impact on the environment	1 (totally disagree)–5 (totally agree)	Blome *et al.* (2014)	0.849	0.584	0.760
PMS sophistication level	We use a multidimensional performance measurement system that combines financial and nonfinancial performance measures We use a multidimensional performance measurement system that additionally describes strategy by using cause-and-effect relationships We use a multidimensional performance measurement system that allows us to define target values and action plans We use a multidimensional performance measurement system that is connected with incentives for management compensation	1 (totally disagree)–5 (totally agree)	Guenther and Heinicke (2019)	0.882	0.653	0.815
Sustainability performance	Please assess the following in comparison with your company's competitors: social sustainability (e.g. the promotion of health, safety and well-being) Please assess the following in comparison with your company's competitors: economic sustainability (balancing the company's finances in the long term) Please assess the following in comparison with your company's competitors: environmental sustainability (e.g. considering and reducing the environmental impact of operations)	1 (weak)–4 (excellent)	Formed by the authors based on the triple bottom line definition of Elkington (1997)	0.822	0.606	0.671
Controls	Number of employees	open field				
	How strong has the competition been for your company in the past Three years?	1 (not strong at all)–5 (very strong)	Guenther and Heinicke (2019)			
	How predictable has your company's operating environment been in the past Three years?	1 (very stable)–5 (very dynamic)	Guenther and Heinicke (2019)			

the endogenous variables were sustainability orientation and sustainability performance. The measurement model outcomes are explained below, followed by the results of the structural model. The means and standard deviations of the constructs and the correlations between them are shown in Table 3. This table also presents the analyses proving that the discriminant validity requirement was fulfilled. All square root values of the AVE were greater than the correlations between the constructs. This result verified the sufficient discriminant validity between the constructs of the study. We then tested the measurement model using several fit indices, namely, the root mean squared error of approximation (RMSEA = 0.051), Tucker–Lewis index (TLI = 0.926), comparative fit index (CFI = 0.940) and standardized root mean squared residual (SRMR = 0.062) and found that the measurement model provided sufficient levels of model fit (Hu and Bentler, 1999).

5.2 Hypothesis testing

The outcomes of the structural model are shown in Table 4. The path between PMS sophistication level and sustainability performance was not significant (p = 0.253 and path coefficient = 0.110). Therefore, PMS sophistication levels do not directly increase sustainability performance. However, PMS sophistication level was significantly (p = 0.000) and strongly (path coefficient = 0.397) related to sustainability orientation. Therefore, PMS sophistication levels lead to increased sustainability orientation. Furthermore, sustainability orientation was significantly (p = 0.012) and strongly (path coefficient = 0.238) related to sustainability performance. These findings prove that the connection between PMS sophistication level and sustainability performance is mediated by sustainability orientation.

Next, we formulated an alternative model for a robustness check supporting the mediator specification. In this model, sustainability orientation was not treated as a mediating variable but as an exogenous variable. The model showed a poorer fit (RMSEA = 0.061, TLI = 0.892, CFI = 0.911 and SRMR = 0.095), thus demonstrating that the structural model with sustainability orientation as a mediator had higher explanatory power than the competing model.

Table 3. Correlation matrix

Construct	Mean	SD	1	2	3
1 Sustainability orientation	3.2398	0.86449	0.764[a]		
2 PMS sophistication level	3.2282	0.89922	0.265***	0.808[a]	
3 Sustainability performance	2.8556	0.55656	0.195**	0.284***	0.778[a]

Note(s): [a]Square root of AVE, Sign. *** ≤ 0.001, **0.001 < p ≤ 0.01

Table 4. Structural equation model analysis results

Path	Path coefficient	Std. Err.	z	p-value
PMS sophistication level → Sustainability performance	0.110	0.096	1.14	0.253
PMS sophistication level → Sustainability orientation	0.397	0.114	3.49	0.000
Sustainability orientation → Sustainability performance	0.238	0.095	2.52	0.012
Company size → Sustainability performance	0.000	0.001	0.88	0.381
Competition → Sustainability performance	−0.011	0.040	−0.28	0.778
Predictability → Sustainability performance	−0.035	0.041	−0.86	0.389

We also tested the impact of three control variables, namely, company size, competition and predictability, on sustainability performance. This analysis revealed that company size (path coefficient = 0.000, ns), competition (path coefficient = −0.011, ns) and predictability (path coefficient = −0.035, ns) did not have a statistically significant effect on social sustainability. Thus, the hypothesized connections were confirmed regardless of company size, competition or market predictability.

In summary, the results significantly support *H2* and *H3* but not *H1* (Figure 3). The results reveal significant evidence for the hypothesized connection between PMS sophistication level and sustainability performance. However, unlike what was predicted in the hypothesis, the relationship was found to be indirect. In particular, sustainability orientation acts as a mediator between PMS sophistication level and sustainability performance. Company size, competition and market predictability do not affect sustainability performance. A summary of the hypothesis testing results and their interpretations is presented in Table 5.

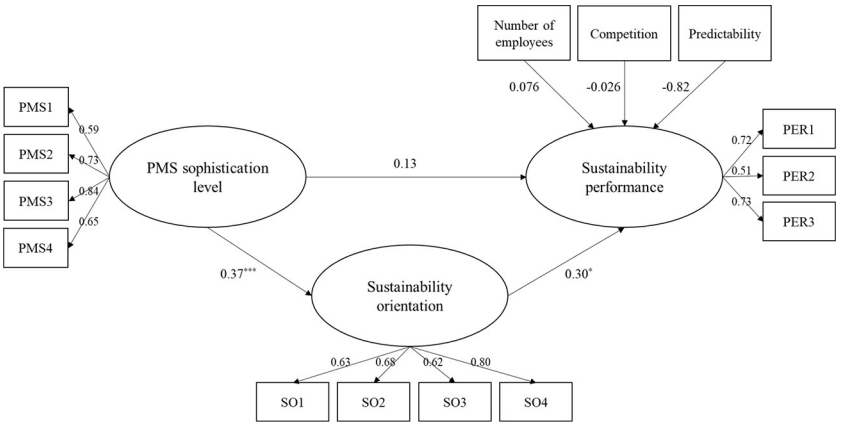

Figure 3. Hypothesis testing results
Note(s): Standardized coefficients

Table 5. Summary of hypothesis testing results

Hypothesis	Hypothesis support	Interpretation
H1. PMS sophistication level is positively associated with sustainability performance	Not supported	The use of sophisticated PMSs does not directly contribute to SMEs' sustainability performance
H2. PMS sophistication level is positively associated with sustainability orientation	Supported	The use of sophisticated PMSs directly contributes to SMEs' orientation toward sustainability
H3. PMS sophistication level is positively associated with sustainability performance through sustainability orientation	Supported	Sophisticated PMSs contribute indirectly to SMEs' sustainability performance. Sophisticated PMSs enhance companies' orientation toward sustainability, which in turn contributes to sustainability performance

6. Discussion and conclusion

6.1 Theoretical implications

The objective of this study was to use the RBV as a theoretical lens to understand the role of sophisticated PMSs in the sustainability of SMEs. Specifically, this study aimed to understand the role of PMS sophistication level in improving organizational orientation toward sustainability and the role of sustainability orientation in mediating the effect of PMS sophistication level on sustainability performance. Prior research has highlighted the need to understand how accounting research can facilitate the transformation to sustainability (Bastini *et al.*, 2021; Gibassier and Alcouffe, 2018). The current study extends this stream of literature in several ways.

The first contribution is a research framework for studying the implications of PMS sophistication level. Previous studies have suggested that the extent to which managerial control systems combine social and environmental objectives and performance measures with financial objectives is crucial for successfully advancing sustainability strategies (Gond *et al.*, 2012; Bastini *et al.*, 2021). We use the RBV to identify the factors that are relevant in the context of organizational sustainability and, by building on prior studies, construct a framework that can be tested in other settings, such as countries and industries. An enhanced understanding of the direct and indirect effects of PMS sophistication level and sustainability orientation level will assist in creating a comprehensive view of sustainable performance management. This study posits that sophisticated PMSs rather than general PMSs can assist in developing sustainability orientation, which is crucial to sustainability performance.

Second, this study contributes to prior research showing that the appropriate use of PMSs helps companies meet their sustainability objectives (Gond *et al.*, 2012; Baumgartner, 2014; Hahn and Figge, 2018; Asiaei *et al.*, 2021; Mio *et al.*, 2022; Gebhardt *et al.*, 2023). The support for hypothesis *H3* indicates that the effects of a sophisticated PMS are realized via sustainability orientation. As stated in previous research, a PMS can be considered as a learning system that provides opportunities for knowledge sharing and can inform staff members about the gaps between current and target performance levels, as well as the current status of the company and upcoming opportunities for improvement (Bititci *et al.*, 2012; Franco-Santos *et al.*, 2007; Garengo *et al.*, 2005). With regard to sustainability, PMSs facilitate the transfer of the information necessary to promote sustainability throughout a company's processes (Cavicchi and Vagnoni, 2021). This impact may occur when managers actively work with sustainability PMSs. They interpret the numbers, discuss them in meetings and use them to guide their operational and strategic choices. These actions are likely to facilitate sustainability orientation. Under these conditions, PMS sophistication is more likely to translate into improved sustainability performance. Thus, the results challenge the finding of Asiaei *et al.* (2021) that integrating sustainability into PMSs enhances organizational performance. Instead, PMSs enhance a company's orientation toward sustainability, which in turn facilitates sustainability performance.

Third, the results of the present study reveal that the connection between PMS sophistication level and sustainability performance is indirect. The lack of support for *H1* indicates that PMS sophistication alone does not increase sustainability performance. One potential explanation for this nonsignificant effect is that many organizations use their PMSs symbolically rather than substantively. SMEs may implement sophisticated systems with numerous sustainability indicators; however, these systems often mainly serve as legitimacy tools that respond to external demands. In this context, PMSs signal a commitment to sustainability but do not guide internal decisions. Thus, SMEs may not directly apply these systems to facilitate sustainability-related decisions. When a PMS is used symbolically, it has a limited influence on managerial attention and resource allocation related to

sustainability. As a result, even highly sophisticated PMS designs may not translate into improved sustainability outcomes. Sustainability results may instead depend on managerial values and strategic intent, as previously explained.

In summary, building on the established research model guided by the RBV, this study extends the understanding of sustainability in accounting research by adopting it within the context of SMEs to explain the role of sophisticated PMSs in achieving organizational sustainability. Following the reasoning of Croom *et al.* (2018) and Taheri *et al.* (2019), we assessed the direct and indirect influences of PMS sophistication level and sustainability orientation to disentangle how these factors can contribute to sustainability performance. By building on these themes, we further our understanding of the emerging role of sustainability in the accounting field.

6.2 Managerial implications

Our findings have several managerial implications. The remarkable effect of PMSs on sustainability orientation is encouraging for SME managers and is likely to motivate managers and policymakers to implement PMSs to facilitate sustainability. As the majority of the underlying emphases and objectives of sustainability are similar in most countries, particularly in Europe, the results are an excellent starting point for practitioners outside Finland to implement PMSs to facilitate sustainability.

By including sustainability orientation in our conceptualization of SME sustainability, this study highlights the importance of developing "softer" factors when aiming for enhanced sustainability. As the power of a sophisticated PMS does not directly reach sustainability performance, managers should focus on developing the softer factor, sustainability orientation. This understanding will help managers focus their efforts on their PMSs in conjunction with their sustainability initiatives. The results of this study further provide guidance to companies' decision-makers to target measurement activities toward enhancing sustainability orientation, after which performance effects can be gained. Similarly, policymakers can target funding instruments to facilitate companies' orientation toward sustainability.

6.3 Limitations and future research directions

The generalizability of the findings is limited because the data were gathered from only one country, Finland. Therefore, the connections between PMS sophistication level, sustainability orientation and sustainability performance might vary in different settings. However, we believe that the results are applicable to SMEs in relatively similar operating environments, particularly in Europe. In addition, because of the limited literature on the relationship between PMSs and sustainability performance, this study's findings are only cursory. The proposed research model can be further validated in various contexts. Future research could use the research model, as it is or adapt it to fit other contexts, including specific industries. The findings provide excellent possibilities for future replication studies.

The 11% response rate matches those of many recent organizational surveys, but it still can cause nonresponse implications. Firms with a stronger interest in the topic or more developed management practices might have been more likely to respond. Nonresponding firms might have also faced tighter resource limits or have different views on PMS and sustainability. These differences may reduce the extent to which the results apply to larger populations. In our study, a comprehensive procedure was followed to avoid nonresponse bias, but it could not remove all hidden differences; therefore, readers should interpret the findings with this limitation in mind.

The use of SEM as an analysis technique also presents limitations. For example, SEM is suitable for large sample sizes only, and it requires data to have a multivariate normal distribution (Ramlall, 2016). These factors should be considered when applying the results. For our study, our sample size of 207 was sufficient, as Kline (2005) proposed that a sample of over 200 is considered large. With regard to the normality of the data, the guidelines for skewness (<3) and kurtosis (<10) values by Kline (2005) were met; thus, the analysis was considered appropriate.

Another limitation is the use of subjective items to capture sustainability orientation and sustainability performance. However, in this study, the use of perceptual measures was justified because of the lack of published performance data on SMEs. Future studies could use parallel objective measures of the sustainability processes and performance of SMEs.

References

Abdul-Rashid, S.H., Sakundarini, N., Raja Ghazilla, R.A. and Thurasamy, R. (2017), "The impact of sustainable manufacturing practices on sustainability performance: Empirical evidence from Malaysia", *International Journal of Operations & Production Management*, Vol. 37 No. 2, pp. 182-204.

Armstrong, J.S. and Overton, T.S. (1977), "Estimating nonresponse bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.

Artiach, T., Lee, D., Nelson, D. and Walker, J. (2010), "The determinants of corporate sustainability performance", *Accounting and Finance*, Vol. 50 No. 1, pp. 31-51.

Asiaei, K., Bontis, N., Barani, O. and Jusoh, R. (2021), "Corporate social responsibility and sustainability performance measurement systems: implications for organizational performance", *Journal of Management Control*, Vol. 32 No. 1, pp. 85-126.

Asiaei, K., Jusoh, R., Barani, O. and Asiaei, A. (2022), "How does green intellectual capital boost performance? The mediating role of environmental performance measurement systems", *Business Strategy and the Environment*, Vol. 31 No. 4, pp. 1587-1606.

Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-120.

Bastini, K., Getzin, F. and Lachmann, M. (2022), "The effects of strategic choices and sustainability control systems in the emergence of organizational capabilities for sustainability", *Accounting, Auditing and Accountability Journal*, Vol. 35 No. 4, pp. 1121-1153.

Baumgartner, R.J. (2014), "Managing corporate sustainability and CSR: a conceptual framework combining values, strategies and instruments contributing to sustainable development", *Corporate Social Responsibility and Environmental Management*, Vol. 21 No. 5, pp. 258-271.

Beusch, P., Frisk, J.E., Rosén, M. and Dilla, W. (2022), "Management control for sustainability: towards integrated systems", *Management Accounting Research*, Vol. 54, p. 100777.

Bititci, U., Garengo, P., Dörfler, V. and Nudurupati, S. (2012), "Performance measurement: challenges for tomorrow", *International Journal of Management Reviews*, Vol. 14 No. 3, pp. 305-327.

Blome, C., Paulraj, A. and Schuetz, K. (2014), "Supply chain collaboration and sustainability: a profile deviation analysis", *International Journal of Operations and Production Management*, Vol. 34 No. 5, pp. 639-663.

Bourne, M., Franco-Santos, M., Micheli, P. and Pavlov, A. (2018a), "Performance measurement and management: a system of systems perspective", *International Journal of Production Research*, Vol. 56 No. 8, pp. 2788-2799.

Bourne, M., Melnyk, S. and Bititci, U.S. (2018b), "Performance measurement and management: theory and practice", *International Journal of Operations and Production Management*, Vol. 38 No. 11, pp. 2010-2021.

Brundtland, G., Khalid, M., Agnelli, S., Al-Athel, S., Chidzero, B., Fadika, L., Hauff, V., Lang, I., Shijun, M., de Botero, M., Singh, M. and Okita, S. (1987), *Our Common Future ("Brundtland Report")*, Oxford University Press, USA.

Buonasera, A., Noto, G. and Rappazzo, N. (2025), "Integrating sustainability into PMM systems of small businesses: some future research directions", *Measuring Business Excellence*, Vol. 29 No. 1, pp. 18-41.

Cavicchi, C. and Vagnoni, E. (2021), "The role of performance measurement in assessing the contribution of circular economy to the sustainability of a wine value chain", *British Food Journal*, Vol. 124 No. 5, pp. 1551-1568.

Chenhall, R.H., Hall, M. and Smith, D. (2017), "The expressive role of performance measurement systems: a field study of a mental health development project", *Accounting, Organizations and Society*, Vol. 63, pp. 60-75.

Cheng, C.C. (2020), "Sustainability orientation, green supplier involvement, and green innovation performance: Evidence from diversifying green entrants", *Journal of Business Ethics*, Vol. 161 No. 2, pp. 393-414.

Croom, S., Vidal, N., Spetic, W., Marshall, D. and McCarthy, L. (2018), "Impact of social sustainability orientation and supply chain practices on operational performance", *International Journal of Operations and Production Management*, Vol. 38 No. 12, pp. 2344-2366.

Danso, A., Adomako, S., Amankwah-Amoah, J., Owusu-Agyei, S. and Konadu, R. (2019), "Environmental sustainability orientation, competitive strategy and financial performance", *Business Strategy and the Environment*, Vol. 28 No. 5, pp. 885-895.

De Leeuw, S. and Van Den Berg, J.P. (2011), "Improving operational performance by influencing shopfloor behavior via performance management practices", *Journal of Operations Management*, Vol. 29 No. 3, pp. 224-235.

Dillman, D.A., Smyth, J.D. and Christian, L.M. (2014), "*Internet, phone, mail, and mixed-mode surveys: The tailored design method*", John Wiley & Sons.

Dowling, J. and Pfeffer, J. (1975), "Organizational legitimacy: Social values and organizational behavior", *Pacific Sociological Review*, Vol. 18 No. 1, pp. 122-136.

Elkington, J. (1997), *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*, Capstone Publishing Ltd.

Elkington, J. (2004), "Enter the triple bottom line", *The Triple Bottom Line: Does It All Add up*?, Earthscan, London.

Epstein, M.J. and Wisner, P.S. (2001), "Using a balanced scorecard to implement sustainability", *Environmental Quality Management*, Vol. 11 No. 2, pp. 1-10.

Fornell, C. and Larcker, D.F. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 18 No. 1, pp. 39-50.

Franco, M. and Bourne, M. (2003), "Factors that play a role in managing through measures", *Management Decision*, Vol. 41, pp. 698-710.

Franco-Santos, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B. and Neely, A. (2007), "Towards a definition of a business performance measurement system", *International Journal of Operations and Production Management*, Vol. 27 No. 8, pp. 784-801.

Franco-Santos, M., Lucianetti, L. and Bourne, M. (2012), "Contemporary performance measurement systems: a review of their consequences and a framework for research", *Management Accounting Research*, Vol. 23 No. 2, pp. 79-119.

Galbreath, J. (2019), "Drivers of green innovations: the impact of export intensity, women leaders, and absorptive capacity", *Journal of Business Ethics*, Vol. 158 No. 1, pp. 47-61.

Garengo, P., Biazzo, S. and Bititci, U.S. (2005), "Performance measurement systems in SMEs: a review for a research agenda", *International Journal of Management Reviews*, Vol. 7 No. 1, pp. 25-47.

Gebhardt, M., Thun, T.W., Seefloth, M. and Zülch, H. (2023), "Managing sustainability–does the integration of environmental, social and governance key performance indicators in the internal management systems contribute to companies' environmental, social and governance performance?", *Business Strategy and the Environment*, Vol. 32 No. 4, pp. 2175-2192.

Gibassier, D. and Alcouffe, S. (2018), "Environmental management accounting: the missing link to sustainability?", *Social and Environmental Accountability Journal*, Vol. 38 No. 1, pp. 1-18.

Gond, J.P., Grubnic, S., Herzig, C. and Moon, J. (2012), "Configuring management control systems: theorizing the integration of strategy and sustainability", *Management Accounting Research*, Vol. 23 No. 3, pp. 205-223.

Goodland, R. (1995), "The concept of environmental sustainability", *Annual Review of Ecology and Systematics*, Vol. 26 No. 1, pp. 1-24.

Goshu, Y.Y. and Kitaw, D. (2017), "Performance measurement and its recent challenge: a literature review", *International Journal of Business Performance Management*, Vol. 18 No. 4, pp. 381-402.

Guenther, T.W. and Heinicke, A. (2019), "Relationships among types of use, levels of sophistication, and organizational outcomes of performance measurement systems: the crucial role of design choices", *Management Accounting Research*, Vol. 42, pp. 1-25.

Gutierrez, D.M., Scavarda, L.F., Fiorencio, L. and Martins, R.A. (2015), "Evolution of the performance measurement system in the logistics department of a broadcasting company: an action research", *International Journal of Production Economics*, Vol. 160, pp. 1-12.

Hahn, T. and Figge, F. (2018), "Why architecture does not matter: on the fallacy of sustainability balanced scorecards", *Journal of Business Ethics*, Vol. 150 No. 4, pp. 919-935.

Hasu, E., Saunila, M. and Ukko, J. (2025), "Transformation management and sustainability performance: on the importance of the enabling and controlling uses of management control systems", *Sustainable Development*, Vol. 33 No. 3, pp. 4283-4293.

Henri, J.F. and Journeault, M. (2010), "Eco-control: the influence of management control systems on environmental and economic performance", *Accounting, Organizations and Society*, Vol. 35 No. 1, pp. 63-80.

Hong, P., Jagani, S., Kim, J. and Youn, S.H. (2019), "Managing sustainability orientation: an empirical investigation of manufacturing firms", *International Journal of Production Economics*, Vol. 211, pp. 71-81.

Hu, L.T. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 1-55.

Imbrogiano, J.P. and Nichols, E. (2021), "How to serve sustainability performance in businesses? An appetizing recipe to link practices to performance in business sustainability research", *Business Strategy and the Environment*, Vol. 30 No. 4, pp. 1610-1622.

Kautonen, T., Schillebeeckx, S.J., Gartner, J., Hakala, H., Salmela-Aro, K. and Snellman, K. (2020), "The dark side of sustainability orientation for SME performance", *Journal of Business Venturing Insights*, Vol. 14, p. e00198.

Khanra, S., Kaur, P., Joseph, R.P., Malik, A. and Dhir, A. (2022), "A resource-based view of green innovation as a strategic firm resource: present status and future directions", *Business Strategy and the Environment*, Vol. 31 No. 4, pp. 1395-1413.

Khizar, H.M.U., Iqbal, M.J., Khalid, J. and Adomako, S. (2022), "Addressing the conceptualization and measurement challenges of sustainability orientation: a systematic review and research agenda", *Journal of Business Research*, Vol. 142, pp. 718-743.

Kline, R.B. (2005), *Principles and Practice of Structural Equation Modeling*, Guilford Press.

Koufteros, X., Verghese, A.J. and Lucianetti, L. (2014), "The effect of performance measurement systems on firm performance: a cross-sectional and a longitudinal study", *Journal of Operations Management*, Vol. 32 No. 6, pp. 313-336.

Lisi, I.E. (2015), "Translating environmental motivations into performance: the role of environmental performance measurement systems", *Management Accounting Research*, Vol. 29, pp. 27-44.

Longoni, A. and Cagliano, R. (2016), "Human resource and customer benefits through sustainable operations", *International Journal of Operations & Production Management*, Vol. 36 No. 12, pp. 1719-1740.

Lohr, S.L. (2010), "*Sampling: design and analysis (advanced series)*", Brooks/Cole Cengage Learning, Global Reporting Initiative.

Luederitz, C., Caniglia, G., Colbert, B. and Burch, S. (2021), "How do small businesses pursue sustainability? The role of collective agency for integrating planned and emergent strategy making", *Business Strategy and the Environment*, Vol. 30 No. 7, pp. 3376-3393.

Magretta, J. and Stone, N. (2002), "What management is? How it works, and why it's everyone's business", Free Press, New York, NY.

Maine, J., Florin Samuelsson, E. and Uman, T. (2022), "Ambidextrous sustainability, organisational structure and performance in hybrid organisations", *Accounting, Auditing and Accountability Journal*, Vol. 35 No. 3, pp. 734-769.

Malmi, T. and Brown, D.A. (2008), "Management control systems as a package–opportunities, challenges and research directions", *Management Accounting Research*, Vol. 19 No. 4, pp. 287-300.

Melnyk, S.A., Bititci, U., Platts, K., Tobias, J. and Andersen, B. (2014), "Is performance measurement and management fit for the future?", *Management Accounting Research*, Vol. 25 No. 2, pp. 173-186.

Merchant, K.A. and Van der Stede, W.A. (2007), *Management Control Systems: performance Measurement, Evaluation and Incentives*, Pearson education.

Mio, C., Costantini, A. and Panfilo, S. (2022), "Performance measurement tools for sustainable business: a systematic literature review on the sustainability balanced scorecard use", *Corporate Social Responsibility and Environmental Management*, Vol. 29 No. 2, pp. 367-384.

Neely, A., Gregory, M. and Platts, K. (1995), "Performance measurement system design: a literature review and research agenda", *International Journal of Operations & Production Management*, Vol. 15 No. 4, pp. 80-116.

Nudurupati, S.S., Bititci, U.S., Kumar, V. and Chan, F.T. (2011), "State of the art literature review on performance measurement", *Computers and Industrial Engineering*, Vol. 60 No. 2, pp. 279-290.

Otley, D. (1999), "Performance management: a framework for management control systems research", *Management Accounting Research*, Vol. 10 No. 4, pp. 363-382.

Pullman, M.E., Maloni, M.J. and Carter, C.R. (2009), "Food for thought: social versus environmental sustainability practices and performance outcomes", *Journal of Supply Chain Management*, Vol. 45 No. 4, pp. 38-54.

Ramlall, I. (2016), "Drawbacks of SEM", In *Applied Structural Equation Modelling for Researchers and Practitioners*, Emerald Group Publishing, pp. 19-20.

Schaltegger, S. and Wagner, M. (2006), "Integrative management of sustainability performance, measurement and reporting", *International Journal of Accounting, Auditing and Performance Evaluation*, Vol. 3 No. 1, pp. 1-19.

Schrettle, S., Hinz, A., Scherrer-Rathje, M. and Friedli, T. (2014), "Turning sustainability into action: explaining firms' sustainability efforts and their impact on firm performance", *International Journal of Production Economics*, Vol. 147, pp. 73-84.

Soytas, M.A., Denizel, M. and Usar, D.D. (2019), "Addressing endogeneity in the causal relationship between sustainability and financial performance", *International Journal of Production Economics*, Vol. 210, pp. 56-71.

Speckbacher, G., Bischof, J. and Pfeiffer, T. (2003), "A descriptive analysis on the implementation of balanced scorecards in German-speaking countries", *Management Accounting Research*, Vol. 14 No. 4, pp. 361-388.

Taheri, B., Bititci, U., Gannon, M.J. and Cordina, R. (2019), "Investigating the influence of performance measurement on learning, entrepreneurial orientation and performance in turbulent markets", *International Journal of Contemporary Hospitality Management*, Vol. 31 No. 3, pp. 1224-1246.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.

Thoradeniya, P., Ferreira, A., Lee, J. and Tan, R. (2021), "The diffusion of sustainability key performance indicators in a developing country context", *Accounting, Auditing and Accountability Journal*, Vol. 34 No. 5, pp. 1246-1274.

Wijethilake, C. and Upadhaya, B. (2020), "Market drivers of sustainability and sustainability learning capabilities: the moderating role of sustainability control systems", *Business Strategy and the Environment*, Vol. 29 No. 6, pp. 2297-2309.

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