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Determinants of environmental, financial, and social sustainable performance of manufacturing SMEs in Malaysia

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ABSTRACT

Discovering the determinants of firm sustainable performance from the Small and Medium-sized Enterprises (SMEs) perspectives is essential. However, few studies have empirically examined all three environmental, financial, and social pillars of sustainable performance into a single research framework in the context of emerging economies like Malaysia. Drawing on the resource-based view and institutional theory, this study identified the determinants of environment, financial, and social sustainable performance of manufacturing SMEs. Data was collected from 209 Malaysian manufacturing firms. A hybrid approach of structural equation modeling (SEM) - artificial neural network (ANN) was used to assess the hypotheses and predict the level of their importance toward sustainable performance. Results showed that green entrepreneurial orientation, green innovation, leadership commitment, stakeholder pressure, and market orientation positively and significantly influenced social performance. Environmental performance was predicted by green entrepreneurial orientation, green innovation, leadership commitment, and market orientation. Green entrepreneurial orientation and market orientation demonstrated a positive influence on financial performance. Results of ANN showed that leadership commitment is the most significant factor influencing environmental and social performance while green entrepreneurial orientation is the first ranked factor predicting financial performance. These findings extend the knowledge by shedding light on the determinants of SMEs' sustainable performance. The study enables SMEs to take proper actions in response to sustainability development. Besides, the findings assist practitioners and policymakers in setting effective plans by giving more attention to leadership commitment and green entrepreneurial orientation as the most significant determinants.

1. Introduction

The rise in population has recently resulted in increased emissions and resource consumption, which burden the environment. The demand from stakeholders on businesses to address these concerns and deal with climate vulnerability, social injustice, and ecological degradation has intensified as a result of the severe social and environmental implications of this trend (El-Kassar and Singh, 2019; Le and Ikram, 2022). Firms are under increasing pressure from outside forces to reduce environmental problems resulting from manufacturing operations while coping with intense competition due to globalization and the growth of technology (Ikram et al., 2021; Singh et al., 2022). An extensive range of business advantages that accrue to companies who practice sustainability have been identified by the prior study, including improved reputation, new marketing opportunities, expanded company capabilities, increased financial value, and improved new product performance (Du et al., 2022; Papadas et al., 2017). As a result, businesses are putting more effort into improving their sustainability, which helps them meet their economic goals as well as their environmental and societal duties (Chatterjee et al., 2022). The sustainable performance combines environmental, social, and financial performance that enhances a firm's ability to operate while benefiting society and the environment (Du et al., 2022).

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Small and medium-sized enterprises (SMEs) contribute significantly to the economic development of most countries (Ismail, 2022). SMEs have generated >65 % of jobs and 55 % of GDP in high-income economies, while they have contributed >70 % of jobs and 60 % of GDP in developing economies (Zafar and Mustafa, 2017). Manufacturing has contributed the most actively to the expansion of economies worldwide. However, it has been proven that the manufacturing SMEs are in significant part to blame for resource consumption, waste production, and water and air pollution worldwide (de Sousa Jabbour et al., 2020; Ndubisi et al., 2021). Therefore, it is crucial for sustainable economic development that SMEs participate more in sustainable resource production and consumption. To create successful strategies and interventions, particularly in the Asian region, it is crucial first to outline the perspectives on the role of SMEs in sustainable economic growth as well as the simplifying drivers and controlling inhibitors (Ndubisi et al., 2021).

Earlier research frequently focuses on sustainability's consequences rather than its antecedent conditions (Du et al., 2022). Meanwhile, there are volumes of studies exploring the sustainable performance in SMEs by focusing on either social (Kraus et al., 2017), environmental (Hamann et al., 2017), or economic performance (Soto-Acosta et al., 2016) separately. A review study by de Sousa Jabbour et al. (2020) found that few studies simultaneously examined these three components. SMEs are important economic drivers in developing countries (Gbandi and Amissah, 2014). However, sustainability has shown the slow success rate in the SME segment (Al Koliby et al., 2022). SMEs require to consider the combination of vital contextual factors, correct technological support, organizational practices, and aligned processes to be successful and sustainable (Alraja et al., 2022). Therefore, there is a need to holistically explore SMEs' sustainable performance by combining vital factors affecting sustainable performance. According to de Sousa Jabbour et al. (2020), sustainability is centred on the balanced and synergy associations between the financial, social, and environmental dimensions and future research examining these relationships' complexities in Asian manufacturing SMEs is required. This approach is known as the triple bottom line (TBL) framework which helps in the implementation of sustainable business initiatives and attains sustainable performance. It is believed that considering economic, environmental, and social factors into processes of decision-making is essential for successful sustainable business performance (Al Koliby et al., 2022; Silvius, 2017).

This research will develop a theoretical model by considering the determinants of all three components to fill the gap. A review of the literature indicates that most of the available studies have employed linear statistical techniques like structural equation modeling (SEM) to identify the factors influencing firms' sustainable performance (Chatterjee et al., 2022; Singh et al., 2022). SEM method is not able to assess the non-linear relationships between factors which result in the simplicity of complex and critical decision-making actions (Al-Sharafi et al., 2022). Therefore, previous researchers have recommended to tackle this issue by integrating the ANN with SEM approach for assessing both linear and nonlinear relationships and ranking the importance of the significant constructs (Asadi et al., 2021; Lee et al., 2020). ANN acts as a complement to SEM in uncovering non-linear and linear connections between constructs (Sharma et al., 2021). Considering the complex nature of the firms' sustainable performance in this study, examining solely linear models might be oversimplified. Therefore, to response the subsequent research objectives, in this study SEM is performed to statistically evaluate the associations between formulated hypotheses, while ANN is utilized to rank the significant predictors more precisely. This approach is deemed to be able to provide a richer understanding of the causal relationships. Meanwhile, ranking the factors can help firms to emphasis on the most crucial factors when making strategic decisions and allocating their resources (Fu and Chang, 2015). This study aimed:

1. To investigate the determinants of environmental, financial, and social sustainable performance of manufacturing SMEs.
2. To identify the level of importance of determinants toward sustainability components using SEM-ANN approach.

Drawing on the "resource-based view (RBV)" and "institutional theory (IT)", this study identified the determinants of environment, financial, and social sustainable performance of manufacturing SMEs. This research provides a strong understanding of the determinants of sustainable SME performance by developing a model that simultaneously covers the three dimensions of sustainable development. The creation of this model will allow the organization to keep track of the information flow that enters the organization and make informed decisions depending on various circumstances. An outcome of the development of such a capability within an organization will increase its ability to take proper actions in response to sustainability development. Besides, the study adds to the literature by prioritizing the determinants of SMEs' sustainable performance utilizing the SEM-ANN approach. This study offers managerial and theoretical insights that matter to business professionals, managers, and policymakers and could assist SMEs in their transition to fully functional sustainable development performance.

The paper continues with Section 2 which depicts literature review. Section 3 depicts methodology and Section 4 provides data analysis. Discussions are provided in Section 5, followed by conclusions, theoretical and managerial implications, and study limitations in Section 6.

2. Literature review

Business success now depends on long-term sustainability by including economic, environmental, and social aspects in executive processes (Silvius, 2017). To encourage businesses to operate sustainably, Elkington (1998) proposed the Triple Bottom Line (TBL) framework, which necessitates considerable adjustments to the company's emphasis on the aforementioned triple bottom line dimensions. By considering three pillars (financial, environmental, and social), this strategy makes it possible to apply sustainable business practices and achieve sustainable performance. The environmental sustainable performance shows how a company's sustainability efforts positively affect the environment both inside and externally (Rao and Holt, 2005). Thus, air pollution and material and energy utilization must all be reduced and devotion to environmental norms needs to be improved. Economically sustainable performance happens when a business strengthens market position and improves market share, leading to a return on investment and more profit (Eltayeb et al., 2011). Socially sustainable performance considers a business's capacity to raise its social prosperity by ensuring the safety and well-being of its employees and the general public (Paulraj, 2011). It enhances interactions between stakeholders and the community, job safety, the working environment, and community living standards (Abdul-Rashid et al., 2017).

Table 1 summarizes the previous studies related to firms' sustainable performance in the context of SMEs. Based on Upper Echelon Theory (UET), Abdulaziz-al-Humaidan et al. (2022) found that corporate social responsibility positively influence social and environmental sustainable performance of SMEs in Tunisia. Seraj et al. (2022) adopted resource-based view theory (RBV) as theoretical foundation and assess sustainable performance among Saudi SMEs. They realized that entrepreneurial competency and entrepreneurial resilience have positive effect on sustainable performance. Le and Ikram (2022) unfolded the connections between firm performance and sustainability innovation of SMEs by assessing firm competitiveness moderating effects. A total of 435 valid responses were collected from the manufacturing of Vietnam. Findings revealed that firms' sustainable performance positively correlates with firm competitiveness and sustainability innovation. San et al. (2022) examined the associations between green entrepreneurial orientation and the sustainable performance of enterprises by considering moderating roles. This study confirmed that sustainable performance is significantly influenced by green entrepreneurial orientation in the scope of Malaysian manufacturing. A study conducted by Singh

Table 1
Studies on determinants of sustainable performance in SMEs.

Research	Context	Theory applied	Research method	Antecedents of Sustainability	Dependent variables
(Abdulaziz-al-Humaidan et al., 2022)	- Tunisia - Manufacturing SMEs	Upper Echelon Theory (UET)	- Survey - PLS-SEM	Sustainability orientation, strategic orientation, tactical orientation, corporate social responsibility	Social, Economic, and Environment performance
(Seraj et al., 2022)	- Saudi Arabia - SMEs	RBV	- Survey - PLS-SEM	Entrepreneurial competency, financial literacy, entrepreneurial resilience	Sustainable performance
(Le and Ikram, 2022)	- Vietnam - Manufacturing SMEs	Stakeholder theory	- Survey - PLS-SEM	Sustainability innovation, firm competitiveness	Operational, Financial, and Environment performance
(San et al., 2022)	- Pakistan and Malaysia - Manufacturing SMEs	Intellectual capital-based view (ICV)	- Survey - CB-SEM	Green technology dynamism, green entrepreneurial orientation, environmental consciousness	Financial, Social, and Environment performance
(Singh et al., 2022)	- Abu Dhabi, UAE - Manufacturing SMEs	Stakeholder theory and RBV	- Survey - PLS-SEM	Stakeholder pressure, green innovation, green dynamic capability	Financial and Market performance
(Jalil et al., 2022)	- Malaysia - SMEs	Innovation capability	- Survey - PLS-SEM	Technology adoption, Innovation capability, strategic planning, leadership management, knowledge management	Sustainable performance
(Al Koliby et al., 2022)	- Malaysia - Manufacturing SMEs	RBV	- Survey - PLS-SEM	Entrepreneurial competencies, innovation	Environment, Economic, and Social performance
(Borah et al., 2022)	- China - SMEs	RBV	- Survey - PLS-SEM	Social media usage, digital leadership, innovation capabilities	Sustainable performance
(Nor-Aishah et al., 2020)	- Malaysia - Manufacturing SMEs	Upper Echelons Theory (UET) and Effectuation Theory (ET)	- Survey - PLS-SEM	Entrepreneurial leadership, entrepreneurial bricolage	Economic, Social, and Environment performance
(Afum et al., 2020)	- Africa - SMEs	RBV	- Survey - PLS-SEM	Operational competitiveness, green manufacturing practices, firm reputation	Economic, Social, and Environment performance
(Chege and Wang, 2020)	- Kenya - SMEs	Technology-Organization-Environment model (TOE)	- Survey - PLS-SEM	Product innovation, process innovation, market innovation, organizational culture, innovative practices, planning and facilitating, regulatory setting, economic and social values, stakeholders collaborations	Sustainable performance

et al. (2022) examined the sustainable performance of manufacturing SMEs in Abu Dhabi. This study found that green innovation (GI) significantly affects firm performance. Jalil et al. (2022) examined Malaysian SMEs' sustainable performance. They found that innovation capability directly impacts on sustainable performance while technology adoption plays mediating role in this relationship. Al Koliby et al. (2022) selected RBV to explore the impact of innovation and entrepreneurial competencies on the SMEs' sustainable performance. The results reported that entrepreneurial competencies have a notable role in predicting sustainable performance. Borah et al. (2022) reported that social media usage significantly impacts sustainable SMEs performance in China. Using RBV, this study also found that innovation capabilities mediated and digital leadership moderated positively the association between sustainable SME performance and social media usage. The association between sustainable performance and entrepreneurial leadership (EL) in Malaysian manufacturing was explored by Nor-Aishah et al. (2020). Findings showed that EL significantly affects environmental and social sustainable performance while its impact on economical sustainable performance was not meaningful. Afum et al. (2020) explored sustainable performance of SMEs in Ghana. They used RBV theory and found that social, economic and environmental performance positively affected by green manufacturing. Meanwhile, operational competitiveness and firm reputation did not show meaningful impact on economic performance. Chege and Wang (2020) examined the connections between technology innovation, environmental sustainability practices and SME performance in Kenya. Results of this study showed that environmentally friendly owners are significantly affected by technological innovation and thus positively impact the companies' performance.

Even the firm performance composes of three critical components of social, environmental, and financial performance, studies simultaneously examining these three components are still limited in the literature. Meanwhile, studies have used simple statistical methods such as multiple linear regression and SEM to assess factors influencing firms' sustainable performance. With the increasing complexity of firms' sustainable performance (e.g. non-linear associations between factors), the demand for new techniques to deal with this issue arises. A combination of SEM and ANN has been considered a powerful research methodology (Lee et al., 2020). Thus, this research aims to identify the determinants of environmental, financial, and social sustainable performance of manufacturing SMEs using a hybrid approach of SEM-ANN.

2.1. Model development

Barney (1991) proposed RBV theory. This theory argues that firms can get a competitive edge by developing strategies and/or talents that are valuable, uncommon, unique, non-transferable, and non-substitutable. RBV emphasized that while having resources available to improve business performance is vital, using those resources effectively is even more crucial. RBV theory helps analyze a firm's performance and competitive advantage (Barney et al., 2011). In the context

of sustainable performance, it is believed that even when organizations have required resources, they need to "be organized to exploit its full potential of its resources and capabilities" (Barney and Hesterly, 2012). Chatterjee et al. (2022) suggested that to assure a firm's sustained performance, appropriate resources must be incorporated, and the businesses must uphold their social and environmental commitments.

Institutional Theory (IT) focuses on the external surroundings of organizations and how these influences might affect how practices and behaviors are adopted. IT asserts that businesses operate in a structured environment and its associated pressure and demands to conform to legal and social and norms (DiMaggio and Powell, 1983). As a result, firms change their structures, processes, and policies to guarantee that their operations in the environment are legitimate. IT is a comprehensive method for comprehending the impact of external pressures/factors on organizational operations (Adebanjo et al., 2018). According to a recent review study by de Sousa Jabbour et al. (2020), RBV and IT are essential to comprehending how external and internal factors might affect performance; thus, they can be more widely utilized in research covering the sustainable development of manufacturing SMEs. This study adopted the RBV and IT as theoretical lenses to identify critical antecedents of the sustainability performance of manufacturing SMEs. From the perspective of the RBV, green entrepreneurial orientation, leadership commitment, and green innovation are considered as significant internal resources which together are valuable for firms' performance. Stakeholder pressure and market orientation are the external factors affecting sustainable environmental, social, financial performance. The theoretical model is demonstrated in Fig. 1.

2.1.1. Green entrepreneurial orientation

Green entrepreneurial orientation refers to the integration of organizational policies emphasizing businesses' managerial policies, strategic orientation, and entrepreneurial behaviors toward sustainable competitive advantage (Jiang et al., 2018). Organizations must rely on their intellectual capital, such as green entrepreneurial orientation, to engage in green entrepreneurial actions and address environmental and stakeholders' protection authorities' concerns (Guo et al., 2020). For SMEs, green entrepreneurial orientation may be a practical way to achieve sustainable development in the face of escalating environmental risks (Crupi et al., 2020). It is suggested that green entrepreneurial orientation is a form of intellectual capital that improves the long-term performance of SMEs in developing nations (San et al., 2022). This factor upholds the triple bottom line idea, which aims to advance businesses (Muangmee et al., 2021) and uses a number of techniques to support social progress and environmental sustainability. First, by improving market efficiency and reducing market failure, entrepreneurial activity may lessen ecological damage and capture economic value (Jiang et al., 2018). Second, by consuming fewer poisonous substances and reducing harmful emissions, the impact to employees' health and safety at work can be minimized (Chuang and Yang, 2014). Third, green entrepreneurial orientation accelerates transformation to requirements of fast-changing environments (Teece, 2016). Meanwhile, green entrepreneurial orientation improves financial performance by focusing on components of entrepreneurial orientation; risk-taking, proactiveness, and innovativeness (Covin and Lumpkin, 2011). Therefore, this study hypothesized that:

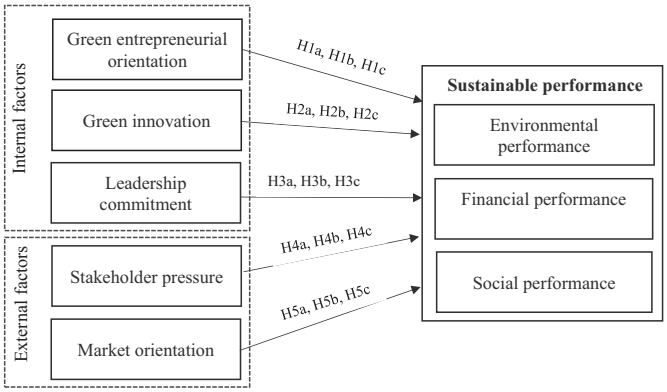

Fig. 1. Proposed model.

H1a. Green entrepreneurial orientation has a positive impact on sustainable environmental performance.

H1b. Green entrepreneurial orientation has a positive impact on sustainable financial performance.

H1c. Green entrepreneurial orientation has a positive impact on sustainable social performance.

2.1.2. Green innovation

The concept of green innovation was initially developed by Fussler and James (1996). It alludes to advancements and innovations in projects, procedures, and products that boost business success. Green innovation is concerned with using environmentally friendly technology in manufacturing to create products and services with little or no impact on the environment (Singh et al., 2020). A company requires a vision which inspires its stakeholders and members for "revolutionary thinking" to "achieve innovation in products and services". In fact, a business can only innovate when it incorporates sustainability into its plans for "align the triple bottom line for future generations" (Kantabutra, 2020). In the literature, green innovation has been discussed from two perspectives. Some studies argue that green innovation businesses do not witness a better financial performance, as green innovation imposes an extra expense to the firms (Driessen et al., 2013; Liu et al., 2011). The revisionist perspective, however, contests this idea and contends that green innovation increases competitiveness in a variety of ways that enhance firm performance characteristics (Gürlek and Tuna, 2018; Ikram et al., 2020). According to Tamayo-Orbegozo et al. (2017), green innovation is crucial to solving sustainability challenges and improving the competitive advantage of organizations. Adams et al. (2016) held the opinion that sustainability innovation calls for consistency in values statement, goods, executions, and processes, so long as its results lead to the concurrent production of environmental, economic, and social benefits. Therefore, this study hypothesized that:

H2a. Green innovation has a positive impact on sustainable environmental performance.

H2b. Green innovation has a positive impact on sustainable financial performance.

H2c. Green innovation has a positive impact on sustainable social performance.

2.1.3. Leadership commitment

Leadership is a motivating factor for firms toward transformations. A committed leader can offer solutions to organizational challenges and significantly influence organizational development (Stankevičiūtė and Savanevičienė, 2021). Leadership is considered an essential resource in environmental management in firms (Zhou et al., 2018). One of the leadership values is transformational leadership, which promotes creative and inspires working environment, motivates and encourages team members and thus improves business performance and innovation in the company (Ng, 2017). Organizational performance, which impacts an organization's sustainability, is heavily influenced by leadership (Nor-Aishah et al., 2020). Entrepreneurial leaders must champion novel ideas, support fresh strategic trajectories, and find innovative solutions to challenging issues in business, society, and the environment (Greenberg et al., 2013). Supporting literature highlights the

significance of leadership and management in promoting environmental commitment (Jang et al., 2017), and the notion that managers are the key players in implementing sustainability (Nicolăescu et al., 2015). In this situation, leadership qualities are anticipated to be crucial in promoting the sustainable performance of firms (Nor-Aishah et al., 2020). Therefore, this study hypothesized that:

H3a. Leadership commitment has a positive impact on sustainable environmental performance.

H3b. Leadership commitment has a positive impact on sustainable financial performance.

H3c. Leadership commitment has a positive impact on sustainable social performance.

2.1.4. Stakeholder pressure

Stakeholder pressure describes the influence that stakeholders have over a business's decisions (Helmig et al., 2016). Due to rising environmental consciousness, businesses are under persistent pressure to improve their company identity and boost their market competitiveness by developing green products (Weng et al., 2015). The adoption of green practices in the enterprises is encouraged by the pressure of many stakeholders both internally and outside, including customers, business owners, suppliers, and governmental requirements. According to Sezen and Cankaya (2013), businesses are reevaluating their manufacturing methods in reaction to external governmental and societal pressures aimed at an environmentally friendly well-being. Stakeholders inspect businesses to ensure they adhere to environmental laws and incorporate sustainable development into their corporate cultures (Chuang and Huang, 2018). In fact, stakeholder pressure can further improve businesses' sustainable performance by deeply comprehending and interacting with the important stakeholders and optimizing their competitive advantage strategies. Therefore, this study hypothesized that:

H4a. Stakeholder pressure has a positive impact on sustainable environmental performance.

H4b. Stakeholder pressure has a positive impact on sustainable financial performance.

H4c. Stakeholder pressure has a positive impact on sustainable social performance.

2.1.5. Market orientation

Market orientation is considered as the constant search for customers' requirements to discover market demands and provide swift and satisfactory solutions for the clients through the creation and dissemination of service value and goods offered to enhance organizational performance (Baker and Sinkula, 2005). Customers have recently been more demanding of ecologically friendly products as environmental worries have grown. Such needs are identified by market orientation businesses, which then mobilize firm resources for green initiatives (Jiang et al., 2018). In fact, market orientation enhanced management expertise to recognize market demands and design rules for sustainable practices (Green et al., 2015). According to Jansson et al. (2017), MO impacts environmental practices and boosts the enterprises' economic performance. Habib et al. (2020) found that market orientation can significantly impact a firm's environmental, social, and financial sustainable performance by improving green supply chain management. Meanwhile, Kazemian et al. (2021) reported the meaningful influence of customer orientation on social and financial sustainable performance. Therefore, this study hypothesized that:

H5a. Market orientation has a positive impact on environmental performance.

H5b. Market orientation has a positive impact on financial performance.

H5c. Market orientation has a positive impact on social performance.

3. Methods

SEM is a multivariate statistical approach to evaluate structural associations. “Covariance-based SEM (CB-SEM)” and “Partial least square-SEM (PLS-SEM)” are two types of SEM. AMOS is certainly the most well-known software tool to perform CB-SEM analysis. CB-SEM is primarily used in confirmatory research to confirm (or reject) theories. However, PLS-SEM is basically performed with SmartPLS software for the purposes of theory development and validation in exploratory research (Hair et al., 2013). In fact, PLS-SEM is predominantly used if the main objective of research is explanation and estimation of target constructs. PLS-SEM provides a higher level of statistical power and higher efficiency in parameter estimation rather than CB-SEM. This approach is more suitable for handling complicated models (Hair et al., 2013). Considering the exploratory nature of this study, PLS-SEM is considered a better analysis than the CB-SEM (Al-Sharafi et al., 2022). The large number of involved constructs and the complexity of the developed model in this study required the utilization of PLS-SEM.

The SEM has been employed frequently to examine the role of factors in hypotheses (Le and Ikram, 2022). PLS-SEM is regarded as a common regression technique for testing the hypothesis, but its application to study the complex decision-making processes is restricted to its linear properties (Kalinic et al., 2019). SEM merely examines the linear associations between constructs which is inappropriate for ranking the constructs influencing decisions to adopt the technology in some cases (Priyadarshinee et al., 2017). One of the most well-known artificial intelligence techniques to address this issue is the ANN. By using ANN, linear and complex non-linear correlations can be found. Through ANN more accurate predictions can be done and distribution assumptions are not necessary in this method (Leong et al., 2013). ANN performs better than the conventional statistical tools and acts as a complement to SEM in uncovering non-linear and linear connections between constructs (Sharma et al., 2021). Many studies have employed combination of SEM and ANN techniques (Asadi et al., 2021; Lee et al., 2020). Therefore, this study utilized a hybrid method combining SEM and ANN for examining the hypotheses and to uncover the linear and non-linear associations in the model and rank the constructs based on their level of importance (Fig. 2).

Thus, the method of this research included two phases. In the first phase, the SmartPLS software was used and the proposed model was assessed using PLS-SEM method to identify the significant determinants of outputs which are environmental, social, and financial sustainable performance. PLS-SEM consisted of measurement model estimation in which PLS Algorithm was run to confirm the reliability and validity of questionnaire instrument. Next, structural model was estimated by performing bootstrapping procedure considering 5000 resamples to evaluate the associations in the developed model (Iranmanesh et al., 2022). In this phase, based on path coefficients (β), T values and P values the acceptance or rejection of hypotheses was determined. Meanwhile, R^2 and Q^2 values were computed to evaluate the performance of model.

In the second phase, the SEM model's structure, which represents the significant relationships between determinants and firms' sustainable performance, is utilized as the design basis of the neural network. In fact, the output results of PLS-SEM were used as ANN's input. IBM SPSS Statistics (SPSS) software was employed and a multi-layer perceptron (MLP) artificial neural network (ANN) algorithm was performed for the ANN analysis. Neural networks made up of input, hidden, and output layers. The sigmoid function was utilized in this study as the output layer and hidden layer activation functions. The relative importance of the forecasters was determined using a tenfold methodology

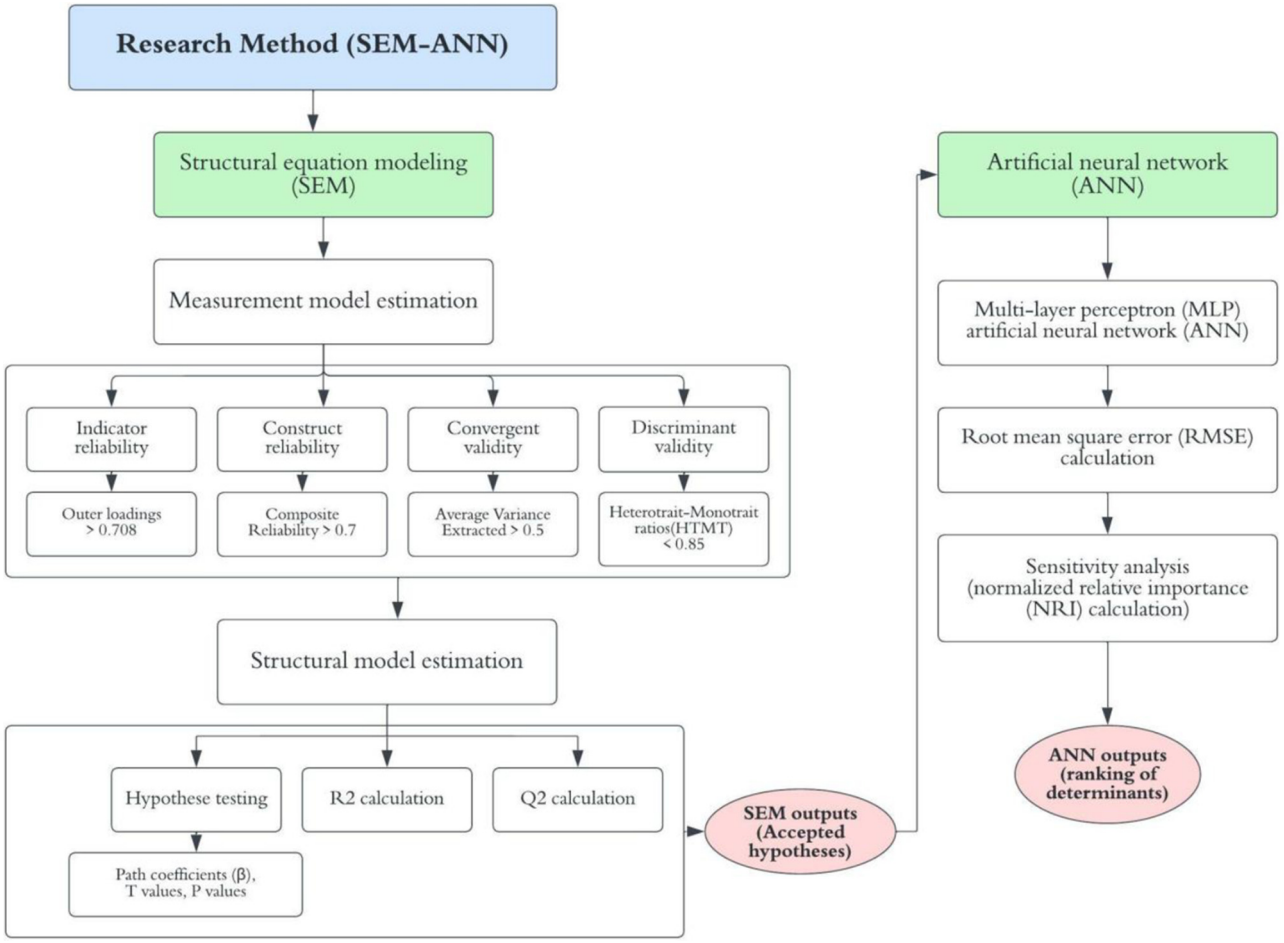

Fig. 2. Research method.

by utilizing 90 % of the data for training and 10 % for testing (Kalinić et al., 2021). The prediction accuracy and efficiency of the ANN models were assessed by root mean square error (RMSE) for both the testing and training datasets. The standard deviations were calculated to check the models' errors. Additionally, to find out the level of importance of each determinant in predicting environmental, social, financial sustainable performance, the normalized relative importance (NRI) was calculated using sensitivity analysis. By dividing each predictor's mean importance by the predictor with the largest important mean, the NRI of each predictor for a particular output neuron was calculated. Therefore, the significant determinants from SEM were ranked by ANN based on their level of importance in predicting sustainable performance.

3.1. Instrument

An electronic questionnaire survey was designed for the current study. This instrument covered three parts: an introduction letter explaining the purpose and scope of study (Part A), demographic information of participants (Part B), and items assessing constructs (Part C). All items were measured using a 5-point Likert scale which ranged from "1 = strongly disagree" to "5 = strongly agree". The items were adopted from the previous studies to ensure content validity and revised to match the goal of this research. The green entrepreneurial orientation was assessed using four questions adopted from (Jiang et al., 2018). Green innovation items were adopted from (Le and Ikram, 2022). Leadership commitment's items were adopted from (El-Kassar and Singh, 2019; Renko et al., 2015). Stakeholder pressure items were obtained from (El-Kassar and Singh, 2019). Market orientation was assessed using four items adopted from (Green et al., 2015). Sustainable environmental performance was assessed using Laosirihongthong et al. (2013) items. Sustainable financial performance and sustainable social performance were assessed using four items each (Paulraj, 2011) (refer to the Supplementary Materials for more details). Prior to conducting the main study, a pilot study of 90 respondents was conducted to confirm the validity and reliability of the questionnaire instrument. Meanwhile, a panel of 15 experts was invited to give their feedback on the questionnaire in term of relevancy, simplicity, readability of selected items. Finally, for the final evaluation, the mentioned ideas and comments were taken into account.

3.2. Respondents

Top and medium-level managers of manufacturing SMEs in Malaysia were invited to complete a web-based survey. Participants have consented to participate in the survey. SMEs in Malaysia's manufacturing sector are known as "firms with sales turnover not exceeding RM50 million OR number of full-time employees not exceeding 200". Even though the majority of the survey's questions were taken from previously published research, we pre-tested the questionnaire before distributing it to Malaysian organizations. Ten manufacturing companies pre-tested the survey to ensure the questions' wording and structure were appropriate for Malaysian enterprises. Based on random sampling, the survey questionnaire was emailed to manufacturing SMEs listed in the "SME Corporation Malaysia" and the "Federation of Malaysian Manufacturers". After excluding the missing and incomplete data, two hundred nine (209) completed questionnaires were utilized for data analysis.

The respondents' descriptive statistics are summarized in Table 2. Most respondents ($n = 124$) were male while ($n = 85$) were female. Around half of the manufacturing SMEs ($n = 105$) had 101–200 employees. The majority of participants had a master's degree ($n = 89$). Considering type of manufacturing, a big part of the firms belonged to the food and beverages sector ($n = 62$) followed by the electrical products and components sector ($n = 32$), oil and gas sector ($n = 29$), and others ($n = 28$).

4. Results

The PLS-SEM included estimation of measurement along with hypotheses testing which were executed using Smart-PLS 3 software.

4.1. Measurement model estimation

To provide acceptable item reliability, outer loadings should be above 0.708. In assessing construct reliability, "Composite Reliability" (CR) values above 0.70 are satisfactory. The "Average Variance Extracted" (AVE) for all questions of a construct should be >0.5 to address the convergent validity (Hair et al., 2019). The outer loadings were all higher than the recommended value of 0.708 except for two items (GEO4 and SFP4). Nevertheless, other items showed high values for loadings; therefore, CR and AVE values for respected constructs were acceptable, and those two items were retained. The reported findings in the Table 3 confirmed that this study had no issues regarding reliability and convergent validity.

To assess discriminant validity, Henseler et al. (2015) proposed the use of Heterotrait-Monotrait ratios (HTMT). Table 4 shows that all HTMT values were lower than the accepted value of 0.85; thus, this study reached an acceptable discriminant validity.

4.2. Structural model estimation

The analysis moved on to the next stage which involved analyzing the developed hypotheses. According to the results, all hypotheses were accepted except H2b, H3b, H4a, and H4b (Table 5). The coefficient of determination (R^2) values of the endogenous constructs of this study were SEP ($R^2 = 401$), SFP ($R^2 = 556$), and SSP ($R^2 = 446$). Stone-Geisser's Q^2 establishes the predictive relevance of the dependent constructs. The findings revealed that the Q^2 values of SEP ($Q^2 = 0.312$), SFP ($Q^2 = 0.228$), and SSP ($Q^2 = 0.336$) exceeded the recommended value (i.e. >0), demonstrating that the model had successfully acquired good predictive relevance.

Table 2
Descriptive statistics of respondents.

Characteristic		Frequency	Percentage
Gender	Male	124	59.33
	Female	85	40.67
Education	Diploma	45	21.53
	Bachelor	56	26.79
	Master	89	42.58
	PhD	19	9.09
Number of firms' employees	<50 staffs	61	29.19
	51–100 staffs	43	20.57
	101–200 staffs	10	50.24
Type of industry	Electrical components and products	32	15.31
	Machinery and equipment	19	9.09
	Textiles and clothing apparel	16	7.66
	Oil and gas	29	13.88
	Rubber and plastic products	23	11
	Food and beverages industry	62	29.66
	Others	28	13.40

Table 3
Measurement model assessment.

Construct	Items	Outer loading	rho_A	CR	AVE
Green entrepreneurial orientation (GEO)	GEO1	0.800	0.752	0.838	0.567
	GEO2	0.783			
	GEO3	0.799			
	GEO4	0.611			
Green innovation (GI)	GI1	0.872	0.882	0.917	0.735
	GI2	0.869			
	GI3	0.828			
	GI4	0.859			
Leadership commitment (LC)	LC1	0.853	0.883	0.916	0.731
	LC2	0.830			
	LC3	0.897			
	LC4	0.838			
Stakeholder pressure (SP)	SP1	0.749	0.738	0.833	0.625
	SP2	0.860			
	SP3	0.758			
Market orientation (MO)	MO1	0.801	0.872	0.907	0.709
	MO2	0.880			
	MO3	0.882			
	MO4	0.801			
Sustainable environmental performance (SEP)	SEP1	0.908	0.921	0.943	0.806
	SEP2	0.896			
	SEP3	0.924			
	SEP4	0.862			
Sustainable financial performance (SFP)	SFP1	0.719	0.708	0.809	0.514
	SFP2	0.736			
	SFP3	0.721			
	SFP4	0.692			
Sustainable social performance (SSP)	SSP1	0.889	0.912	0.936	0.785
	SSP2	0.900			
	SSP3	0.888			
	SSP4	0.866			

4.3. ANN

In this phase, ANN models were developed based on the significant independent variables determined by the SEM. In this study, three sets of ANN models were developed using the three endogenous constructs (SEP, SFP, and SSP). This first ANN model comprises four constructs (GEO, GI, LC, and MO) in the input layer and SEP in the output layer. The second ANN model has two constructs (GEO and MO) as the input layer and SFP in the output layer. The third ANN model consists of five constructs (GEO, GI, LC, SP, and MO) in the input layer while the output layer consists of SSP.

This study used RMSE to check the efficiency of network models. The closer the RMSE value is to zero (0), the more predictive ability the ANN model will exhibit (Qaderi et al., 2021). The mean value of RMSEs in model A is (training = 0.497, testing = 0.483), model B is (training = 0.481, testing = 0.472), and model C is (training = 0.475, testing = 0.465) (Table 6), demonstrating that the linear-nonlinear relationships can be detected with high reliability using ANN models (Alam et al., 2021). The ANN models are considered as great level of accuracy in assessing the associations because the mean values of RMSE are

Table 4
Heterotrait-Monotrait ratio (HTMT) test.

	GEO	GI	LC	MO	SEP	SFP	SP	SSP
GEO								
GI	0.388							
LC	0.609	0.521						
MO	0.408	0.580	0.589					
SEP	0.523	0.531	0.581	0.535				
SFP	0.819	0.528	0.614	0.624	0.655			
SP	0.652	0.452	0.512	0.431	0.414	0.530		
SSP	0.570	0.500	0.590	0.503	0.583	0.547	0.635	

Table 5
Results of hypotheses testing.

Hypotheses	Path coefficients (β)	Standard deviation (STDEV)	*T* value	*P* values	Results
H1a: GEO → SEP	0.188	0.066	2.856**	0.002	√
H1b: GEO → SFP	0.565	0.076	7.472***	0.000	√
H1c: GEO → SSP	0.146	0.073	2.003*	0.023	√
H2a: GI → SEP	0.212	0.067	3.152***	0.001	√
H2b: GI → SFP	0.101	0.067	1.520	0.064	×
H2c: GI → SSP	0.141	0.069	2.041*	0.021	√
H3a: LC → SEP	0.228	0.078	2.925**	0.002	√
H3b: LC → SFP	0.069	0.066	1.044	0.148	×
H3c: LC → SSP	0.221	0.084	2.633**	0.004	√
H4a: SP → SEP	0.022	0.070	0.321	0.374	×
H4b: SP → SFP	−0.011	0.057	0.190	0.425	×
H4c: SP → SSP	0.264	0.063	4.228***	0.000	√
H5a: MO → SEP	0.187	0.069	2.685**	0.004	√
H5b: MO → SFP	0.201	0.080	2.506**	0.006	√
H5c: MO → SSP	0.129	0.073	1.769*	0.038	√

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

rationally low with acceptable standard deviations in training and testing stages.

4.4. Sensitivity analysis

A sensitivity analysis was performed to rank the predictors based on their normalized relative significance (NRI). Table 7 shows that in predicting SEP, LC has the highest level of rank, followed by GEO, MO, and GI (model A). MO is most important in predicting SFP compared to the GEO (model B). LC is the most influencing construct in predicting SSP, followed by GI, MO, SP, and GEO (model C).

5. Discussion

The results of this study indicate that green entrepreneurial orientation influences SMEs' performance in terms of the environment, finance, and social aspects. These findings match San et al. (2022), who found green entrepreneurial orientation as a significant driver of all three dimensions of sustainable performance in Malaysia. Similarly, Ameer and Khan (2020) findings demonstrated that higher green entrepreneurial orientation considerably improves the industrial economic, social, and environmental performance in emerging economies. Jiang et al. (2018) demonstrated how green entrepreneurial orientation facilitates the adoption of ethical business practices that reduce resource consumption and social risks while enhancing environmental and social performance. The growth of entrepreneurial activities is dependent on green entrepreneurial orientation since it is recognized for its risk-taking orientation, proactive nature, and green innovativeness (Jiang et al., 2018). According to San et al. (2022), an intense green entrepreneurial orientation enables businesses to find, develop, and take advantage of new business possibilities to produce environmentally sustainable products and processes that meet consumer demand. In fact, the significant development of green entrepreneurial orientation makes it possible for businesses to recognize chances for growing their market shares. Companies that depend on an inherent selectivity of capabilities may introduce a structural risk when established patterns are applied to the new jobs. The risk will increase as the environment becomes more volatile. Monitoring green entrepreneurial orientation evolution is essential to mitigate the danger it entails.

Results confirmed that leadership commitment is the most significant determinant of sustainable environmental and social performance. However, the influence of leadership commitment on sustainable financial performance was insignificant. This finding aligns with Nor-Aishah et al. (2020). Sapta et al. (2021) and Iqbal and Ahmad (2021) confirmed that leadership style influences the overall sustainable performance of organizations. The insignificant relationship between leadership commitment and sustainable financial performance can be due to several reasons. According to Kuratko (2007), entrepreneurial risk occurs when managers spend heavily on green technology, innovation, and the development and training of their workforce; risk also occurs when leaders provide their staff excessive benefits, such as high wages, bonuses, and pay. They may be exposed to financial risk due to these choices, impacting how well their cash flow performs. However, such risk only exists in the short term. In the long run, it is clear that

Table 6
RMSE values of ANN models.

Network	Model A		Model B		Model C	
	Inputs: GEO, GI, LC, MO		Inputs: GEO, MO		Inputs: GEO, GI, LC, SP, MO	
	Output: SEP		Output: SFP		Output: SSP	
	Training	Testing	Training	Testing	Training	Testing
ANN1	0.500	0.450	0.470	0.490	0.436	0.390
ANN2	0.497	0.502	0.505	0.504	0.482	0.488
ANN3	0.492	0.469	0.482	0.499	0.499	0.497
ANN4	0.503	0.44	0.491	0.439	0.455	0.496
ANN5	0.502	0.493	0.456	0.477	0.453	0.359
ANN6	0.482	0.493	0.537	0.462	0.510	0.470
ANN7	0.507	0.484	0.492	0.472	0.502	0.490
ANN8	0.489	0.535	0.454	0.487	0.455	0.518
ANN9	0.499	0.484	0.455	0.504	0.461	0.456
ANN10	0.499	0.480	0.471	0.387	0.496	0.482
Mean	0.497	0.483	0.481	0.472	0.475	0.465
SD	0.007377836	0.025956825	0.026074301	0.036308494	0.025767863	0.050710774

Table 7
Sensitivity analysis for models A, B, and C.

Model A			Model B			Model C		
Output: SEP			Output: SFP			Output: SSP		
Variables	Normalized importance	Rank	Variables	Normalized importance	Rank	Variables	Normalized importance	Rank
GEO	76 %	2	GEO	100 %	1	GEO	51 %	5
LC	100 %	1	MO	84 %	2	LC	100 %	1
GI	44 %	4	–	–	–	GI	86 %	2
MO	49 %	3	–	–	–	MO	82 %	3
						SP	56 %	4

high-sustainability businesses beat rivals in the stock market and accounting metrics.

According to the findings, green innovation positively influenced sustainable environmental and social performance, but not sustainable financial performance. Muangmee et al. (2021) reported a positive effect of green innovation on sustainable environmental, financial, and social performance. Le and Ikram (2022) found that green innovation indirectly improves sustainable environmental, financial, and social performance by enhancing firm competitiveness. Meanwhile, in contrast to the results of this study, the impact of green innovation on the financial and market performance of organizations was also supported by (Singh et al., 2022). Green innovation is the capacity to introduce novel goods or procedures. For instance, improving eco-design practices can lower harmful or hazardous emissions. Utilizing modern, cutting-edge process technologies can reduce negative environmental effects and address issues related to people's health and safety (Jiang et al., 2018). The insignificant relationship between green innovation and sustainable financial performance can be due to the firm context. Previous researchers claimed that firm-level factors such as firm capabilities, culture, and green innovation could moderate the associations between environmental product innovation and firm performance (Hermundsdottir and Aspelund, 2021). Meanwhile, it showed that most manufacturing companies in Malaysia still stick to the traditionalist view and consider green innovation as a financial burden and cost driver for firms.

Market orientation was found to have a positive influence on sustainable financial, environmental and social performance. Ho et al. (2018) did not find any noteworthy connection between market orientation and firm financial performance. However, Kazemian et al. (2021) revealed that customer orientation increases financial and social performance. According to de Guimarães et al. (2018), market orientation can improve cleaner production, resulting in high business performance into sustainability. According to Jansson et al. (2017), market orientation plays a significant role in SMEs' sustainability. The possible explanation for the insignificant impact of market orientation on sustainable financial performance is that manufacturing companies think they are market-oriented, but in reality, they are not, or else they wouldn't be able to use market orientation to gain a competitive edge. Indeed, although they are somewhat aware of market orientation and engage in these actions, it is insufficient to significantly improve financial performance.

Finally, stakeholder pressure was found to positively influence sustainable social performance but not sustainable environmental and financial performance. Baah et al. (2021) showed that the relationship between stakeholder pressure and sustainable environmental performance was significant, while the relationship was not significant for stakeholder pressure and financial performance. Baah et al. (2020) showed that stakeholder pressure has no influence on financial performance while significantly influencing social reputation. In contrast to this finding, Singh et al. (2022) study found that stakeholder pressure indirectly and positively influences firms' financial and market performance. The insignificant impact of stakeholder pressure on sustainable financial performance can be justified as external stakeholders impose a high pressure on firms to adopt and execute green production techniques and as a result need major preliminary investments, which also considerably and negatively affect financial performance (Zailani et al., 2012). According to Baah et al. (2020), stakeholder pressure has a good and profound impact on the environment and society. As a firms' reputation grows, more stakeholders are drawn to it, and these draws help the firm perform better. Thus, stakeholder pressure has a beneficial impact on financial performance even though the relationship was not substantial. It is crucial to remember that failing to respond to stakeholder pressure could result in lawsuits from regulatory organizations, which could harm the company's reputation and stakeholder relationships.

5.1. Theoretical contributions

This research is one of the first attempts to investigate the factors impacting the sustainable performance of SMEs through a comprehensive view of environmental, financial, and social and using the SEM-ANN methodological approach. The RBV and IT theories were used as theoretical bases to better understand what drives businesses to be sustainable. According to the RBV theory, businesses with strong green entrepreneurial orientation, green innovation, leadership commitment, and market orientation capabilities create environmental capabilities that produce a long-lasting competitive advantage and performance. Considering results, it is suggested that firms should leverage such strategic resources to shape and implement initiatives that influence their sustainable environmental, financial, and social performance. Furthermore, IT emphasized that businesses adopt behaviors that are considered acceptable and norm behaviors of their industry, depending on the external environment in which they operate. The IT explains how giving in to pressure from organizational stakeholders improves institutional isomorphism and organizational legitimacy. While several attempts have been done on firms' sustainable performance in recent years, limited studies exist that adequately evaluate the importance of the key factors influencing SMEs' environment, financial, and social sustainable performance. Thus, this research provides more useful insights into the role of green entrepreneurial orientation, green innovation, stakeholder pressure, market orientation, and leadership commitment in enhancing sustainable performance of SMEs.

5.2. Managerial contributions

This study has a number of policy and sustainability implications. Green entrepreneurial orientation plays a vital role by influencing environmental, financial, and social performance. Businesses can use green entrepreneurial orientation as one of their dynamic capabilities to take advantage of market opportunities. Dynamic capacities, such as new technical advancements, will promote entrepreneurial activity and self-awareness. Managers should also rearrange and integrate internal resources in novel ways. They must close the informational gap needed for entrepreneurial operations. To quickly respond to client requests and achieve long-term competitive advantages, developing dynamic capabilities is helpful (Jiang et al., 2018). Businesses must educate their staff members about green entrepreneurial orientation and share examples of high-performing teams that are committed to long-term skill development through training and cross-organizational learning. If employees are educated about green entrepreneurial orientation and

inter-organizational learning, they show more interest in embracing difficulties on how to propose innovation and are more likely to manage the limitations. Meanwhile, transferring knowledge within a company might offer advice on how to satisfy client requests better (Pratono et al., 2019).

This study proved that green innovation favourably influences sustainable environmental performance and sustainable social performance. In light of this, business leaders are urged to take into account long-term systematic plans for green innovation as this is the only means by which companies may continue to exist and grow over the long term, particularly in the context of emerging nations such as Malaysia. It recommends that green innovation be viewed from the progressive perspective in which green innovation can result in win-win scenarios for a company, whereby such notion benefits uplift businesses by continuously improving activities which assist in minimizing the usage of materials, waste, energy, water, maximizing product quality, reuse and recycling, and using environmentally friendly materials and packaging (Le and Ikram, 2022). However, for any option to be feasible and attainable, company management are advised that each decision on innovation strategy needs to be wisely reviewed by considering specific firm resources and context. Otherwise, as it takes time to assess the actual effects of green innovation, such initiatives may hinder business operations or diminish competitive advantage. Government agencies must consider rigorous environmental regulations, which are seen as outside pressure to encourage businesses to adopt sustainability technologies. This might be a powerful incentive for companies to engage in green innovation (Ikram et al., 2019). Managers and staff members of SMEs should be pushed to expand their entrepreneurial skills by participating in pertinent training and reskilling development courses to stay creative, active, and informed of current changes in the business operations, involving in the growth and survival of the company.

Leadership commitment was found to be the most important antecedents of sustainable environmental and social performance. As a result, SME owners should lead with vision, passion, integrity, and confidence when dealing with volatile and uncertain business conditions. To put it another way, SME owners should develop the necessary skills to see and seize business opportunities to guide their team toward accomplishing sustainable objectives (Nor-Aishah et al., 2020). It is advised that businesses highlight and reward the green leadership traits needed to adopt green human resource management procedures. Green practices are crucial for hiring, retaining, and developing staffs that bring their green values and beliefs to work to support the firm's strategy of out-competing rivals with green processes and green goods (Singh et al., 2020). Since there was no correlation between leadership commitment and sustainable financial performance, SME owners should be aware that while investing in sustainability activities may not immediately boost their profit, doing so will result in long-term advantages and better economic performance.

Market orientation showed a positive influence on SMEs' sustainable performance. Policymakers should raise SMEs' understanding of client expectations without overlooking strengths, limitations, and business performance of competitors because a lack of customer orientation might impede the development of chain performance and innovation (Ho et al., 2018). To achieve exceptional performance, manufacturing enterprises' marketing and operations departments must work together to build and sustain a strong market-oriented culture that will help them recognize shifting consumer preferences for environmentally friendly goods and services more quickly.

Finally, stakeholder pressure was found to have a positive influence on sustainable social performance. Therefore, it is advocated that managers and leaders incorporate stakeholder expectations into strategy formulation processes to satisfy them and make them partners in businesses' value-generating processes. To better understand and manage stakeholder expectations and improve performance in a dynamic market, managers and leaders should develop and deploy stakeholder integration capabilities (Singh et al., 2022).

6. Conclusions

Since environmental concerns are increasingly considered vital to business success, SMEs in both developed and developing countries worldwide have attempted to identify the determinants of sustainable business performance. Due to high pressure from competitors and stakeholders, larger companies are the first that move to social responsibility. However, for SMEs that intend to apply sustainable practices the concerns remain. Therefore, drawing upon the RBV and IT, this study identified the determinants of manufacturing SMEs' environmental, financial, and social sustainable performance. Data was collected from 209 managers of manufacturing SMEs in Malaysia and analyzed using a hybrid SEM-ANN methodology. SEM was performed to statistically assess the relationships between formulated hypotheses, while ANN was utilized to rank the impact of significant predictors more precisely. Results of SEM showed that green entrepreneurial orientation, green innovation, leadership commitment, and market orientation are significant predictors of environmental sustainable performance. Social sustainable performance was positively influenced by green entrepreneurial orientation, green innovation, leadership commitment, market orientation, and stakeholder pressure. Financial sustainable performance was predicted by green entrepreneurial orientation and market orientation. The sensitivity analysis of ANN showed that leadership commitment is the most significant predictor of environmental and social sustainable performance. However, the influence of leadership commitment on sustainable financial performance was insignificant. Sustainable financial performance is mainly predicted by green entrepreneurial orientation, followed by market orientation. SME firms may be exposed to financial risks when leaders spend heavily on green initiatives and the development and training of their employees. However, it is believed that such risk only exists in the short term. High sustainability performance in the long term provides higher financial benefits for them and beats rivals in the stock market. Entrepreneurial firms normally focus on new opportunities to develop services ahead of competitors. They can strategically decrease unnecessary operations, mature their life cycle phases, and thus gain greater financial success. Therefore, businesses need to transform their green entrepreneurial strategy into innovative green services to satisfy societal expectations and customer preferences. The findings of this study can be used as a guide for managers, policymakers, and scholars working on organizational sustainable growth in SME context.

Even though this study provided useful theoretical and managerial contributions, some limitations are worth further investigation. This study has focused on manufacturing SMEs in Malaysia. Future studies can expand the methodology by considering different clusters of SMEs in Malaysia or even in other similar developing nations to provide more in-depth results based on each cluster. This study selected green entrepreneurial orientation, green innovation, stakeholder pressure, leadership commitment, and market orientation as possible determinants of SMEs' sustainable performance based on available literature. Future attempts can conduct interviews with panel experts in industry and education sectors to develop more related factors that can be assessed in this context. Future studies can examine the moderating and mediating influence of respondents' demography, national-, market-, industry-, and firm-level factors on the proposed hypotheses. In this study, data was collected from managers of manufacturing SMEs. Future attempts can focus on collecting different stakeholders' and end users' perspectives. This study used a hybrid approach of SEM-ANN. Future studies can employ other multi-criteria decision-making or soft computing techniques to provide complementary results.

Declaration of competing interest

The authors have no conflicts of interest to declare.

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Appendix A. Supplementary data

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