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Research Article

Key Determinants of SMEs Sustainable Performance in West Sumatra: A PLS-SEM Analysis

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ABSTRACT

Rising environmental pressures from population growth and industrial expansion in Indonesia necessitate sustainable business practices. Yet, adoption among Small and Medium-sized Enterprises (SMEs) remains obstructed by low energy efficiency, inadequate waste management, limited technological and financial access, and managerial shortcomings. Using two theories, resource based view (RBV) and institutional theory (IT), this study has mapped the relationships between internal and external factors and the triple-bottom-line performance of SMEs. This study investigates and tests these relationships amongst the factors that influence environmental, social, and economic sustainability performance by Partial Least Squares Structural Equation Modeling (PLS-SEM). This study designs the approach as a cross-sectional survey, gathering primary data from 110 SMEs to assess the proposed relationships among internal, external, and sustainability performance. Internal factors consist of green entrepreneurial orientation (GEO), green innovation (GI), and leadership commitment (LC), while market orientation (MO) and stakeholder pressure (SP) represent the external factors. Findings indicate that market orientation (MO) has a positive and significant effect across the entire triple-bottom-line (financial, social, environmental), whereas stakeholders pressure (SP) exerts a significant positive effect only on the financial and social dimensions. On the other hand, the internal factor comprising green entrepreneurial orientation (GEO), green innovation (GI), and leadership commitment (LC) does not significantly impact sustainability performance. These results indicate that among the external drivers examined, market orientation is the most comprehensive predictor of sustainability performance, whereas stakeholder pressure has a significant effect only on the financial and social dimensions. Practically, Indonesian SMEs are advised to constantly interpret and react to market signals and stakeholder expectations, whereas, policymakers are recommended to pair the tool of stakeholder pressure with capability-enhancement programs in terms of the operational system.

Keywords: Sustainability performance, triple-bottom-line, market orientation, stakeholder pressure, SMEs

INTRODUCTION

Indonesia's accelerated population growth and industrialization in recent decades have amplified environmental burdens; greater output has led to increased resource consumption, pollution, and higher emissions [1]. Consequently, there have been increasing incentives forcing the manufacturing sector and its SME members to implement sustainability [2]. Sustainability is the driving force of numerous organizations, including SMEs, and has played a crucial role in motivating and affecting economic growth. Sustainable actions taken by the various entities enhance environmental, social, and economic performance, while providing significant local and national economic growth and a positive contribution to the local community [3]. SMEs have been the primary drivers of economic

growth in Indonesia, accounting for 61% of the country's economy. As well, the sector has created most of the jobs in the country, supporting almost 97 percent of the total workforce, including around 117 million Indonesians (Indonesian Bureau of Statistics, 2024).

Given their crucial role in Indonesia's national economy, it is undeniable that these SMEs generate extensive negative environmental impacts, especially manufacturing operations in Indonesia [4]. The numerous issues generated include poor energy efficiency, unsatisfactory management of industrial waste, and the consumption of hazardous raw materials [4],[5]. These issues become more prominent due to underlying causes like lack of quality of human resource management [6], difficulty for firms to gain access to credit markets [7], lack of access for technology-related help [7],[8], lack of management expertise [9], and even environmental factors where there are differences in policies and action that could be taken [10]. Existing literature has established a familiar inventory of obstacles confronting manufacturing SMEs However, these determinants are predominantly examined in isolation, leaving unresolved the critical question of their interdependent effects on economic, social, and environmental performance. All such factors are considered antithetical to the successful adoption and execution of sustainability.

It makes their combined impact on the economic, social, and environmental aspects of SMEs unclear and not aligned with the adoption of sustainability practices [4]. The existing evidence shows clear signs that sustainability adoption offers benefits including reputation improvement, lower operational costs, increased market access and better sustainability-related performance outcomes. Yet, those identified benefits have rarely been analyzed in integrated terms of financial, social, and economic performance in the SME segment, especially within a constrained framework in a developed setting like Indonesia [11].

Although the necessity of implementing sustainability practices is widely understood and adopted by most countries and businesses, many existing studies focus primarily on impacts [4],[11],[12] rather than on the antecedents of sustainability adoption. The majority of antecedent research appears to examine the aspects separately and fails to present a methodological framework for holistic analysis [13],[14]. That means that an analysis that takes individual perspectives may overstate their results or may mask the synergies and trade-offs between them, which result in incorrect conclusions. The triple Bottom Line (TBL) approach, which offers a synergistic way to combine economic, social, and environmental factors, provides a foundational framework for sustainable practices, especially in challenging SME sectors that tend to be highly fluid [4],[15],[16]. This holistic analysis framework not only provides an effective means to establish practices of sustainability but also provides directives on how they can be improved, and this analysis requires testing of all internal and external drivers across all three dimensions of TBL to determine whether these drivers bring about synergy or conflict.

To devise effective strategies for improving sustainability performance, it is therefore essential to develop an extensive knowledge base of the factors that influence the effective integration of sustainability in SMEs. This present study adopts PLS-SEM as an analytical tool suited to modeling the complex interrelationships among multiple factors, such as various dimensions and indicators, for determining the significant relationship between the factors and the dimensions of sustainability performance.

Studies on the sustainability of SMEs tended to focus only on one aspect of the Triple Bottom Line approach, without giving much consideration to the needs of the whole. Studies that employ PLS-SEM analysis to investigate the three aspects of the TBL and are applicable to SMEs are relatively rare, and it appears that limited empirical evidence studies have been conducted for developing nations like Indonesia. In fact, the originality and contributions of the proposed study are based on the consideration that it encompasses the entire three aspects of the TBL for Indonesian SMEs. Accordingly, this study aims to identify the key factors that simultaneously influence sustainability performance, thereby providing a comprehensive understanding of the drivers of sustainability performance in the context of developing economies.

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METHODS

Research Framework

The research framework provides a structured foundation for examining the relationships explored in this study. It organizes the key constructs and clarifies how they are conceptually linked within a single analytical model. Rather than treating variables independently, the framework positions them within a unified system to capture their combined influence on organizational outcomes. This approach allows the study to establish clear directional relationships and guide hypothesis development in a coherent manner.

Resource-Based View and Institutional Theory

This study incorporates the Resource-Based View and Institution Theory in consideration of the elements impacting performance. Resource-Based View Theory, proposed by Barney [17], confirms that an organization can attain a superior and competitive position in the industry if it manages to have and utilize valuable, rare, and non-substitutable internal resources. On the contrary, Institution Theory is concerned with the external environment surrounding the organization, which posits that internal practices and behaviors are a result of external institutional elements; hence, institutions exert control mechanisms over the organization. Thus, organizations choose to align their structures, systems, and policies to the demands within the market. The model provides a wide scope of research, detailing the impact of external variables on the organization [18].

This theoretical integration directly informs the selection of the study's determinants, which prioritizes variables that have received consistent empirical support and theoretical salience in recent SME sustainability syntheses, e.g., [4],[11],[13]. From the RBV perspective, green entrepreneurial orientation (GEO), green innovation (GI), and leadership commitment (LC) are specified as internal factors—each representing a distinct and actionable resource category. From the Institutional Theory perspective, stakeholder pressure (SP) and market orientation (MO) are specified as external factors. These factors constitute the research variables, as illustrated in Figure 1.

Sustainable Performance

Sustainable performance refers to an organization's ability to create long-term economic value while meeting its social and environmental obligations. This definition aligns with the Triple Bottom Line (TBL) framework adopted

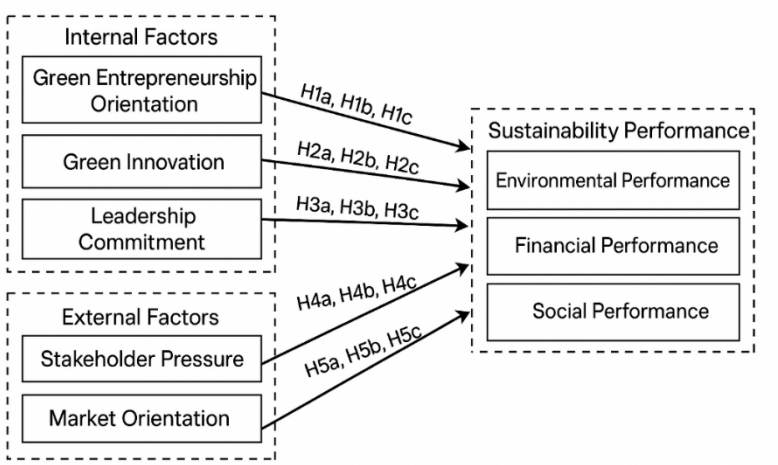

Figure 1. Research Model

in this study, as it captures the multidimensional nature of sustainability performance through economic, social, and environmental outcomes [19],[20]. Economic performance refers to a company's financial well-being and profitability so that it can survive in the long run. Environmental criterion evaluates the company's natural resources management, energy use and waste. On the other hand, social performance refers to how the organization manages its relationship with human capital, relations with its community and ethical behavior [21].

Sustainable performance is largely dependent on numerous factors, both inside and outside the organization that collectively determine the sustainability results of a company [22],[23]. The organization, being the internal capabilities and external forces, becomes a unique operational context where the interaction of these factors determines the success level and extent of the sustainable performance expressed not only in the dimensions of environmental sustainable performance (ESP), sustainable financial performance (SFP), and socially sustainable performance (SSP) but also across them in a holistic manner.

Internal Factors

According to the Resource-Based View (RBV), the three internal factors of Green Entrepreneurial Orientation (GEO), Green Innovation (GI), and Leadership Commitment (LC) are the strategic sources that lead to sustainable performance. Green Entrepreneurial Orientation (GEO) represents a company's environmental issues-solving and opportunity-seeking attitude, which aligns well with the natural development of the firm, thereby making the firm a driver of the sustainability paradigm. The environmental aspect becomes a lever for the organization to discover new markets, reinforce its legitimacy, and improve its relationships with the community [24]. Green Innovation (GI), which encompasses both green product innovations and green process innovations, is a key driver of reductions in environmental footprint.

In turn, environmental performance (ESP) is enhanced (through the introduction of end-user eco-efficiency and the cleaner production of the same product), thus allowing the company to cut back on costs and improve its brand value, which, in turn, leads to the reinforcement of the financial performance dimension, and the same time, the social dimension is also addressed as safer products and a cleaner environment become available [25]. Leadership commitment (LC) is the foundation that not only unifies and leverages, but also energizes the organization's assets to achieve the firm's sustainable goals. Among other things, committed leaders facilitate the provision of resources, promote a culture that values the environment and social issues and become instrumental in driving the initiatives that result in the integration of sustainability into core business activities, thus making it possible for all three dimensions of sustainable performance to benefit [26].

Previous studies generally indicate that GEO, GI, and LC contribute positively to sustainability performance. However, the effects of these factors may vary across industries and organizational contexts, particularly among SMEs in developing economies that often face resource and capability constraints. Drawing on the Resource-Based View (RBV), these factors are regarded as valuable organizational resources that can enhance environmental, social, and financial performance. Therefore, the following hypotheses are proposed:

H1a: GEO has a positive and significant association with ESP
H1b: GEO has a positive and significant association with SFP
H1c: GEO has a positive and significant association with SSP
H2a: GI has a positive and significant association with ESP
H2b: GI has a positive and significant association with SFP
H2c: GI has a positive and significant association with SSP
H3a: LC has a positive and significant association with ESP
H3b: LC has a positive and significant association with SFP

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External Factors

The external factors derived from institutional theory, stakeholder pressure (SP) and market orientation (MO), are incorporated alongside internal drivers as key hypothesized determinants. Their specific influence across the Triple Bottom Line dimensions is treated as an open empirical question. Stakeholder pressure (SP) refers to the requirements that define a range of different entities, such as customers, regulators, or communities, that are calling for the company to adopt environmentally responsible and socially sustainable practices. In the SME context, stakeholder pressures constitute a salient external force that directly affects managerial decisions and resource allocation due to limited organizational capacity. Social and environmental responsibilities tend to be the areas most affected by coercive and normative changes, as stakeholder pressure, which is by far the most influential of all types of pressures, pushes companies to improve their performance on the dimensions of environmental management, ensure economic fairness and transparency, and engage in social activities as a way of gaining legitimacy and at the same time avoiding reputational risks [27].

Market orientation (MO), especially when it is directed towards sustainability, is concerned with understanding and responding to market information, making it conceptually distinct from the outcomes that may result from such actions. Previous studies suggest that MO contributes to sustainability performance through several pathways. First, insights gained from green market intelligence encourage firms to develop eco-innovations and adopt environmentally responsible processes, which can improve environmental performance [5]. Second, by recognizing emerging opportunities in green markets, firms can differentiate themselves from competitors, strengthen their competitive position, and achieve better financial performance [14]. Third, MO helps firms align their practices with evolving societal expectations, thereby enhancing stakeholder relationships, organizational legitimacy, and social sustainability performance [24],[28]. Although both SP and MO originate from Institutional Theory, their effects on the Triple Bottom Line may not be uniform. Consequently, this study treats these relationships as empirical issues and tests them through the hypotheses outlined below:

H4a: SP has a positive and significant association with ESP
H4b: SP has a positive and significant association with SFP
H4c: SP has a positive and significant association with SSP
H5a: MO has a positive and significant association with ESP
H5b: MO has a positive and significant association with SFP
H5c: MO has a positive and significant association with SSP

Research Design and Hypothesis

The study has been carried out empirically through quantitative methods by using a structural equation model PLS-SEM approach. The PLS-SEM approach was adopted to study the interaction of factors correlated with sustainable performance (economic, social, and environmental dimensions). PLS-SEM was chosen for several methodological reasons that align with the objectives and characteristics of this study. First, the research model includes multiple latent constructs measured using reflective indicators, requiring an analytical approach capable of handling complex measurement structures without relying on strict assumptions of multivariate normality [37]. Second, the primary objective of this study is to examine and predict the relative effects of several organizational factors on environmental, financial, and social performance. This prediction-oriented focus is consistent with the strengths oPLS-SEM, which is particularly suitable for explaining variance and identifying key driver relationships rather than testing an established covariance structure [37]. PLS-SEM allows the simultaneous estimation of multiple endogenous constructs within a single structural model [37]. All PLS-SEM analyses were performed using SmartPLS 4, a widely used software package for estimating and evaluating complex structural equation models based on the partial least squares approach.

The proposed research model consists of eight constructs, i.e., GEO, GI, LC, SP, MO, ESP, SFP, SSP (Figure 1). The instrument was developed through a systematic adaptation process. An initial pool of 45 items was derived from prior SME sustainability studies [4],[5],[30]-[34], covering eight constructs in the research model. Items were then linguistically and contextually adapted for Indonesian manufacturing SMEs. To establish content validity, the adapted items were reviewed by five academic and industry experts [35], who rated each indicator on a five-point Likert scale for relevance to SMEs in West Sumatra.

Content validation was performed by a panel of five experts, purposively selected to balance academic and industry perspectives. The panel included three academics with expertise in sustainability and operations management, and two practitioners from West Sumatra's manufacturing SMEs, chosen for their direct operational knowledge of the local context. Each expert independently rated the adapted indicators on a five-point Likert scale (1–5) for significance and relevance to SMEs. A two-step decision rule was applied: an item-level Content Validity Index (I-CVI ≥ 0.80, i.e., endorsement by at least 4 of 5 experts) was required for retention [38]. Items with I-CVI between 0.60–0.79 were revised based on qualitative feedback and re-evaluated, while those below 0.60 were excluded. This procedure eliminated 14 items, yielding a final set of 31 valid indicators for the questionnaire.

The questionnaire was formulated to depict the relationships between the indicators of internal factors, external factors, and sustainable performance. This questionnaire consisted of two parts. The first part recorded general information about respondents (gender, educational background, industry type, the number of employees, and business age). The second part was used to elicit the respondents' opinions on the factors that influence the sustainable performance of SMEs, and they were asked to respond using a five-point Likert scale (1 = very low to 5 = very high). To ensure that responses reflected reliable organizational-level knowledge, the questionnaire was administered exclusively to SME owners or top-level managers who are directly involved in strategic and operational decision-making, with a minimum of three years' tenure in their current role. Participation was voluntary, and respondents were informed of the study's purpose before completing the survey. All responses were kept confidential and used solely for research purposes.

Sample and Data Collection

Sampling frame for this study was registered manufacturing SMEs extracted from Department of Industry and Trade of West Sumatra Province official database. This population stratified according to industrial sector in order to guarantee sectoral representative and followed by random sampling from each stratum. In total, there were 200 questionnaires sent to number of SMEs both digitally (Google Form link) and directly, only 110 usable questionnaires were collected after elimination based on three elimination criteria, namely 1) invalid respondents; 2) non response or pattern that indicated missing data (e.g. Straight-lining); 3) roles and tenure of respondents insufficient. Sample size of this study calculated based on guidelines from Tabachnick and Fidell [36] where minimum sample size required for multiple regression analysis was defined as $n > 50 + 8p$. Here 'n' means the minimum size of the sample and p refers to the number of independent variables in the model. Since this project used five independent variables, it implied that at least 90 SMEs would be required for instrument evaluation. The data collection method, which included questionnaires administered both online and offline, was conducted over a period of three months, from the beginning of June to the last week of August 2025. To ensure dataset consistency, unique SME identifier codes were assigned to prevent duplicate responses and incomplete questionnaires.

Data Analysis

The researchers employed Structural Equation Modeling Partial Least Squares (SEM-PLS) with SmartPLS (version 4.0) to validate the relationships among the variables. The path's significance level is indicated by the Bootstrapping

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Table 1. Descriptive statistics of respondents (n = 110)

Demographic Statistics	Category	Frequency	Percentage (%)
Gender	Male	52	47.27
	Female	58	52.73
Education Level	Junior High School or lower	3	2.73
	Senior High School	38	34.55
	Bachelor's Degree (S1) / Diploma (D3)	61	55.45
	Master's Degree (S2) or higher	8	7.27
Industry Type	Electronic Components and Products	14	12.73
	Machinery and Equipment	8	7.27
	Textiles and Apparel	10	9.09
	Oil and Gas	5	4.55
	Rubber and Plastics Products	2	1.82
	Food and Beverage	61	55.45
	Others	10	9.09
Number of Employees	Less than 50	73	66.36
	51–100	28	25.45
	101–200	9	8.18
Years in Business	Less than 2 years	27	24.55
	2–5 years	48	43.64
	5–10 years	23	20.91
	More than 10 years	12	10.91

operation (5000 resamples). To assess the statistical significance of the path coefficients, a bootstrap procedure with 5,000 resamples was applied. Significance was determined using a two-tailed t-test at the 5% significance level ($\alpha = 0.05$), with 95% bias-corrected and accelerated (BCa) confidence intervals computed to evaluate estimate precision; an effect was considered significant when the confidence interval did not include zero [37]. The data analysis method for SEM-PLS is based on Hair [37], which includes inspecting the measurement model (outer model), evaluating the structural model (inner model), and performing hypothesis testing.

RESULTS AND DISCUSSION

Demographic characteristics of respondents

The study involved 110 SMEs in West Sumatra, with data collected from owners and managers serving as key informants for their respective firms. As data were collected from SME owners and managers as key informants, their managerial experience and educational background may shape their perceptions of sustainability practices. The gender distribution was almost equal with 47.27% males and 52.73% females. Most respondents held either a Bachelor's degree or a diploma (55.45%), and the main industry was food and beverage (55.45%). Most companies had fewer than 50 employees (66.36%) and had been in operation for 2–5 years (43.64%). Table 1 presents a summary of the respondents' demographic characteristics.

Measurement model evaluation

The measurement model evaluation focused on construct reliability (Cronbach's alpha), composite reliability, average variance extracted (AVE), and convergent and discriminant validity, with the results presented in Table 2,

Table 2. Construct Validity and Reliability

Construct	Cronbach's alpha	Composite reliability (ρ_c)	Average variance extracted (AVE)
ESP	0.858	0.904	0.702
GEO	0.861	0.906	0.706
GI	0.829	0.887	0.662
LC	0.880	0.918	0.736
MO	0.868	0.910	0.719
SFP	0.911	0.938	0.790
SP	0.874	0.922	0.799
SSP	0.904	0.933	0.777

while the combined PLS-SEM outer and inner model output is illustrated in Figure 2. Construct reliability is considered good if the reliability coefficient is greater than 0.7, according to Hair [37]. For all constructs in the present study, Cronbach's alpha values were greater than 0.7, thus the reliability condition was fulfilled. Average Variance Extracted (AVE) is an indicator of convergent validity, which is verified when the AVE value is at least 0.5 [38]. Discriminant validity was determined by the Fornell–Larcker criterion [38], according to which the square root of a construct's AVE should be greater than its correlation with any other construct.

The outcomes of the measurement model evaluation presented in Table 2 reveal that the constructs of this research have good internal consistency reliability as evidenced by the Cronbach's alpha values which ranged from 0.829 to

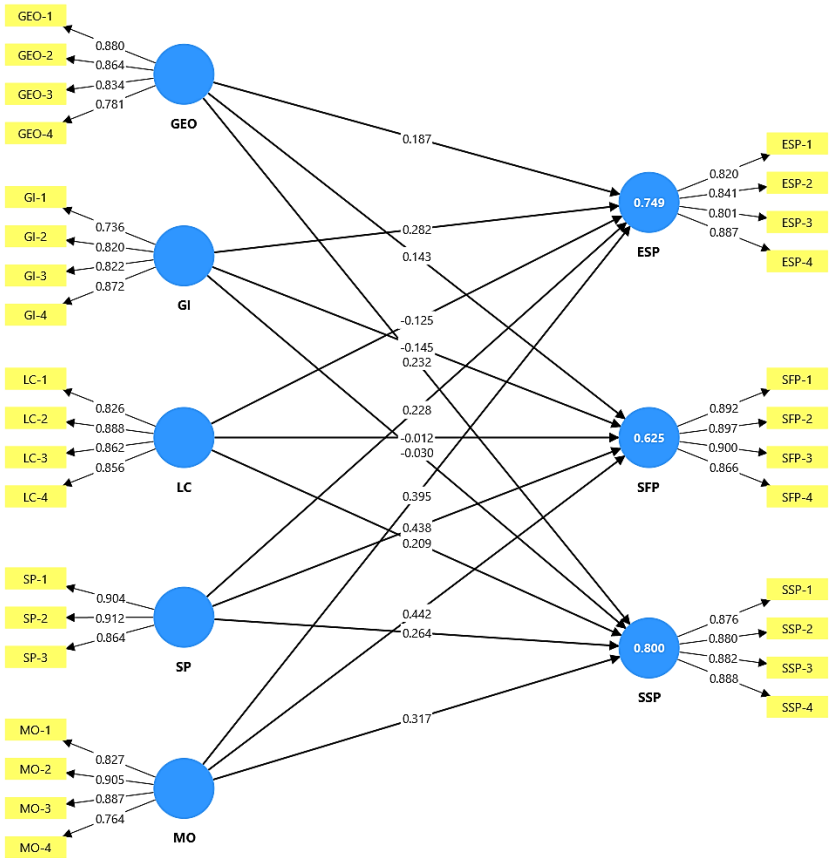

Figure 2. Combined PLS-SEM outer and inner model output

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Table 3. Item Loadings for All Constructs

Construct	Item	Loading	Construct	Item	Loading
GEO	GEO1	0.812	GI	GI1	0.754
	GEO2	0.778		GI2	0.802
	GEO3	0.835		GI3	0.789
	GEO4	0.843		GI4	0.813
LC	LC1	0.863	SP	SP1	0.881
	LC2	0.851		SP2	0.894
	LC3	0.829		SP3	0.907
	LC4	0.873			
MO	MO1	0.845	ESP	ESP1	0.825
	MO2	0.862		ESP2	0.812
	MO3	0.839		ESP3	0.791
	MO4	0.823		ESP4	0.810
SFP	SFP1	0.832	SSP	SSP1	0.824
	SFP2	0.817		SSP2	0.835
	SFP3	0.790		SSP3	0.841
	SFP4	0.802		SSP4	0.827

0.911, thus, the threshold value of 0.7 was exceeded. Item-level factor loadings, which ranged from 0.700 to 0.910, all exceeding the recommended minimum of 0.60 [37] (see Table 3 for complete item loadings). Composite reliability values also varied within the range of 0.887-0.938; thus the construct's reliability was additionally confirmed. The convergent validity indicator, namely the Average Variance Extracted (AVE), was at least 0.50 for all constructs in the study [38], hence, the tested latent variable accounted for more than half of the variance in its observed variables.

Discriminant validity was assessed using the Fornell–Larcker criterion, which requires that the square root of each construct's AVE exceed its correlations with all other constructs [38]. As shown in Table 4, the diagonal values (square roots of AVE) for most constructs—ESP (0.838), GEO (0.840), GI (0.814), LC (0.858), SFP (0.889), SP (0.894), and SSP (0.881)—exceed their respective off-diagonal correlations, thereby supporting discriminant validity for these constructs. However, the diagonal value for MO (0.848) was slightly lower than its correlation with LC (0.851), indicating that Market Orientation and Leadership Commitment may not be fully distinct empirically in this sample. This suggests that the two constructs may share a substantial amount of variance in the context of Indonesian SMEs, potentially reflecting the role of leadership in shaping market-oriented strategies and vice versa. Such conceptual overlap is plausible in resource-constrained SME settings, where the same decision-maker often drives both strategic orientation (MO) and leadership commitment (LC), making it difficult for respondents to distinguish between the two in practice.

Table 4. Discriminant Validity (Fornell-Larcker Criterion)

Construct	ESP	GEO	GI	LC	MO	SFP	SP	SSP
ESP	0.838							
GEO	0.776	0.840						
GI	0.789	0.800	0.814					
LC	0.759	0.767	0.818	0.858				
MO	0.774	0.715	0.726	0.851	0.848			
SFP	0.735	0.672	0.611	0.688	0.709	0.889		
SP	0.744	0.773	0.754	0.761	0.640	0.713	0.894	
SSP	0.799	0.799	0.756	0.834	0.808	0.762	0.783	0.881

Structural Model Evaluation

The structural model was tested to explore the interrelationships between internal variables, external variables, and sustainable performance, using the bootstrapping technique in SmartPLS. The PLS-SEM bootstrapping and algorithm test, with 5000 repetitions, revealed the level and significance of the path coefficients of the proposed hypotheses. Table 5 below presents the standardized critical ratios (t-values), p-values, and β-values for each proposed path. A total of five hypotheses were supported at 95% confidence levels out of the total fifteen.

The results of the hypothesis test show that market orientation (MO) has a positive and significant influence on sustainable performance across all three dimensions. Pressures from stakeholders (SP) also have a positive and significant influence on sustainable financial and social performance. On the contrary, green entrepreneurial orientation (GEO), green innovation (GI), and commitment to leadership (LC) are not significantly related to sustainable performance on any of the dimensions at the 5% significance level, although GEO→SSP ($p = 0.072$) and GI→ESP ($p = 0.064$) are not far from it.

The variance effect size, which has not been accounted for by the endogenous latent variables, is quantifiable via the formula devised by Cohen (Table 4). Following the procedure developed by Cohen [39] to identify the value of the effect size, it is divided into small ($0.02 \leq f2 < 0.15$), medium ($0.15 \leq f2 < 0.35$), and large ($f2 \geq 0.35$). Thus, while statistical significance supports the predictive roles of MO (across all three TBL dimensions) and SP (on SFP and SSP only), the associated effect sizes are mostly small ($f^2 = 0.066–0.137$), with only MO→SFP reaching a medium effect ($f^2 = 0.163$). Moreover, the non-significant SP→ESP path exhibits a medium effect ($f^2 = 0.163$), underscoring that statistical non-significance does not equate to negligible practical importance. Consequently, the practical relevance of these drivers should not be conflated solely with their statistical acceptance, and the modest effect sizes call for a cautious interpretation of the findings.

The theoretical model also underwent scrutiny by examining the explained variance (R-squared / R^2) on the endogenous variables. R-squared is a measure used to establish the extent to which the dependent variable is explained by the independent variables [37]. The R^2 values for ESP (0.749), SFP (0.625), and SSP (0.800) indicate moderate to substantial explanatory power [37], suggesting that the model accounts for a considerable portion of

Table 5. Hypothesis testing results

Construct	path coefficients (β-values)	T value	P values	Hypotheses	f^2	Effect Category
GEO -> ESP	0.187	1.227	0.220	H1a: Not supported	0.038	Small
GEO -> SFP	0.143	1.320	0.187	H1b: Not supported	0.015	Negligible
GEO -> SSP	0.232	1.799	0.072	H1c: Not supported	0.073	Small
GI -> ESP	0.282	1.852	0.064	H2a: Not supported	0.079	Small
GI -> SFP	-0.145	1.055	0.292	H2b: Not supported	0.014	Negligible
GI -> SSP	-0.030	0.149	0.881	H2c: Not supported	0.001	Negligible
LC -> ESP	-0.125	0.726	0.468	H3a: Not supported	0.011	Negligible
LC -> SFP	-0.012	0.089	0.929	H3b: Not supported	0.000	Negligible
LC -> SSP	0.209	1.535	0.125	H3c: Not supported	0.037	Small
SP -> ESP	0.228	1.681	0.093	H4a: Not supported	0.163	Medium
SP -> SFP	0.438	3.333	0.001	H4b: Supported	0.137	Small
SP -> SSP	0.264	3.068	0.002	H4c: Supported	0.132	Small
MO -> ESP	0.395	3.152	0.002	H5a: Supported	0.066	Small
MO -> SFP	0.442	3.164	0.002	H5b: Supported	0.163	Medium
MO -> SSP	0.317	2.558	0.011	H5c: Supported	0.111	Small

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variance in each sustainability dimension. As these statistics reflect in-sample explained variance rather than out-of-sample predictive accuracy, the findings support the model's explanatory relevance rather than asserting general predictive capability.

Discussion and Implications

The results of this research indicate that a market-oriented approach has a significant positive impact on a company's environmental, financial, and social performance. This means that companies that pay attention to market needs, competition, and customer expectations are in a better position to implement sustainability strategies that have the greatest impact. These findings are consistent with previous studies, e.g., [5],[28],[40],[41], where it was argued that market orientation is the main driver of competitive advantage and also a tool that facilitates sustainability integration in business practices, thus giving more ground to the earlier findings.

The pressure of stakeholders primarily improves the financial and social aspects of the company, as these enterprises make changes to meet the requirements for accountability and sustainability. On the one hand, this involves enhancing their social responsibility, while on the other hand, it leads to greater financial resilience. However, this favorable pattern is not observed for the environmental dimension, where the effect of stakeholder pressure was statistically non-significant ($p = 0.093$). This mixed result suggests that stakeholder demands are more readily translated into compliance-based social and financial practices than into environmental investments. Consequently, this discovery offers only partial alignment with stakeholder theory [42] and is in line with the empirical evidence given in the recent studies, e.g., [43], that stakeholder pressures are a major driving factor behind the adoption of sustainable practices by businesses, which, in turn, implement the two, social responsibility and financial performance, simultaneously.

On the other hand, green entrepreneurial orientation, green innovation, and leadership commitment were found to have no statistically significant impact on sustainable performance in this case. However, the null pattern is not uniform across these constructs. For instance, GEO approaches marginal significance for SSP ($p = 0.072$, $\beta = 0.232$) while remaining clearly non-significant for ESP and SFP, suggesting that the social dimension may be its most sensitive outlet. In contrast, GI exhibits a positive, near-significant effect on ESP ($p = 0.064$, $\beta = 0.282$) but shifts to negative directions for SFP ($\beta = -0.145$) and SSP ($\beta = -0.030$), indicating that innovation efforts in this context may impose short-term resource trade-offs rather than delivering balanced TBL improvements. Meanwhile, LC shows a small positive coefficient on SSP ($\beta = 0.209$) yet negligible negative effects on ESP (-0.125) and SFP (-0.012), reinforcing that leadership intent may not yet translate into tangible execution in these domains within this setting.

In effect, this is a reversal of those studies, e.g., [44]-[46], which demonstrated the factor to have a strong positive influence especially in resource-rich and technologically advanced SMEs. As a result, these green initiatives are unable to demonstrate their performance outcomes [47]. Moreover, Tuncel et.al., [48] similarly found no significant influence of green entrepreneurial orientation, green innovation, and leadership commitment and thus can be considered as additional evidence in support of the current findings. Nevertheless, the borderline significant effect of green entrepreneurial orientation on social performance and green innovation on environmental performance may have an impact, even in the short term, that will be felt more strongly in the future as the development of organizational resources continues.

The observed pattern of driver effectiveness is only partially aligned with the resource-based view (RBV) [17], as the framework's emphasis on internal strategic resources finds limited empirical support in this sample; instead, the results underscore the dominance of market-oriented knowledge and responsiveness as the primary sources of superior and sustainable performance. The fact that market orientation remains a statistically significant variable for

environmental, financial, and social performance indicates that market orientation is a strategic capability enabling firms to leverage sustainability to strengthen their relationships with the market [49]. Correlating the influence of stakeholder pressures on both financial and social aspects is yet another demonstration of stakeholder theory [42], which posits that companies adjust their strategies in line with stakeholders' expectations, thereby maintaining their legitimacy and ensuring long-term survival.

One thing that should be mentioned is that the non-significant results of green entrepreneurial orientation, green innovation, and leadership commitment go against the line of research of previous scholars (e.g., [44]-[46], and indicate that their impact can change according to different situational factors, such as environmental turbulence, resource availability, or organizational maturity [50]. Thus, this assertion opens the door to research in the future that considers mediating and moderating variables and their effects over time to uncover the complete influence of sustainable performance.

In terms of managerial implications, its results outline a list of priorities of managerial action. These include the need to incorporate market information into the day-to-day operation activities such as market, customer, and competitor monitoring and market trend reporting. Market information must inform product design, operations planning, and waste management in product systems to result in actual process actions regarding the environment. The connection between societal and environmental actions and market strategy might help in achieving societal value and gaining a competitive advantage while reducing the challenges associated with stakeholder communication [51]. Positive effects of the latter could result from collaboration and transparency of communication with stakeholders. For policy-makers, the study indicates the need to complement the external pressure instruments such as sustainability reporting and certification programs with appropriate technical assistance and audit actions.

CONCLUSION

Drawing on the resource-based view (RBV) and the institutional theory (IT), this study aims to examine the antecedents of cross-dimensional sustainability performance among Indonesian SMEs. Especially concerning Indonesian SMEs in West Sumatra, evidence has documented the critical role of external forces, mainly market orientation, in driving sustainable performance, and highlighting that responsiveness to market signals shapes how sustainability is prioritized. Market orientation has a significant positive impact, whilst stakeholder pressure has a significant positive impact, but does not have a significant impact on the environment dimension, and suggesting that external expectations prioritize visible outcomes. Meanwhile, the proposed green entrepreneurial orientation, green innovation, and leadership commitment did not establish a significant direct influence on sustainability performance, and pointing to a gap between intention and execution. This pattern suggests a plausible explanation: the internal green capabilities of the Indonesian SMEs community may not yet have reached a threshold sufficient to translate into measurable performance gains, and indicating that capability development may still be uneven, and alternatively, the non-significant direct effects may also reflect contextual factors that merit further investigation, and in this regard, based on the differentiated pattern of drivers influence found in this research, two sets of prescriptive implications. First, for managerial concerns, this evidence strongly encourages managers to incorporate external knowledge of market characteristics into planning decisions, integrate customer preferences into production scheduling decisions, and adopt production processes that reduce waste and support environmentally friendly product design, and second, for managerial concerns related to the government's policy, this finding indicates a need for policymakers to supplement the external pressure mechanism with supporting actions that assist operational decisions on environmental impact, and furthermore, being a cross-sectional research design, the current findings suggest correlations, not causations, thus future research should test mechanisms that connect environmental sustainability with its related constructs, for example, investigating the mediation of resource

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allocation processes in connecting stakeholder pressures and the internal capacities to environmental sustainability, and it is essential to examine causality by using a longitudinal research design.A

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CONFLICT OF INTEREST

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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