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-RESEARCH ARTICLE-

FINANCIAL PERFORMANCE OF INDONESIAN MSMES: THE ECONOMIC ROLE OF SUSTAINABILITY STRATEGY, INTELLECTUAL CAPITAL, AND DIGITAL LITERACY

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─Abstract─

In an era characterised by heightened global uncertainty, maintaining sound financial outcomes has become imperative for micro, small, and medium enterprises (MSMEs) as they confront escalating environmental, social, and economic constraints while striving for sustained competitiveness and long-term viability. Although MSMEs play a pivotal role in national economic advancement, many continue to struggle to translate sustainability-oriented initiatives and intellectual capital into tangible financial results. In response, this study focuses on identifying the critical factors shaping the financial performance of Indonesian MSMEs. Drawing on survey data collected from 296 business managers, the analysis applied PLS-SEM to examine the interrelationships among the constructs specified in the conceptual framework. The results indicate that both corporate sustainability strategy and intellectual capital exert a significant effect on financial performance. In addition, sustainability performance partially mediates the association between corporate sustainability strategy and financial performance, whereas green innovation practices fully mediate the relationship between intellectual capital and financial performance. The analysis further reveals that digital literacy strengthens the impact of corporate sustainability strategy on sustainability performance, as well as the influence of intellectual capital on green innovation practices. By integrating sustainability, innovation, and digitalisation perspectives, this study enriches the theoretical discourse on MSMEs financial performance and offers actionable insights for managers and policymakers aiming to reinforce the financial resilience of MSMEs within emerging economy contexts.

Keywords: Resource Allocation, Firm Value, Technological Capability, Productivity, Cost Saving, Emerging Economies, Indonesian Economy, Sustainability.

INTRODUCTION

In an increasingly environmentally and socially conscious global context, sustainability has evolved from a discretionary organisational choice into a core component of long-term strategic orientation. For MSMEs, the adoption of sustainable practices extends beyond compliance with stakeholder and regulatory demands, serving instead as a mechanism for safeguarding competitiveness, strengthening organisational resilience, and supporting sustained growth within highly dynamic business settings (Carayannis et al., 2025). Under conditions of intensified market volatility, MSMEs face distinctive obstacles in preserving growth trajectories and ensuring long-term viability. Macroeconomic instability, accelerated technological change, supply chain interruptions, and recurrent global crises heighten their exposure to operational and financial risks, thereby threatening continuity and survival (satpathy et al., 2025).

MSMEs constitute a central pillar of Indonesia's national economy. Currently, approximately 64.2 million MSMEs operate across the country, collectively generating about 61% of gross domestic product. From an employment perspective, they absorb nearly 119.6 million workers, representing roughly 97% of the national labour force (Aprilia et al., 2025). Notwithstanding this substantial contribution, recent evidence suggests a deterioration in the financial condition of Indonesian MSMEs. Sluggish credit expansion, rising non-performing loans, reduced turnover, and shrinking profit margins point to increasing financial fragility and underline the urgent requirement for coordinated and systemic support mechanisms (ANTARA, 2025). In addition, Indonesian MSMEs continue to encounter difficulties in converting sustainability-oriented strategies into improved financial outcomes. Existing practices are often rudimentary, the uptake of green innovation remains limited, and sustainability reporting capabilities are underdeveloped (Supriadi et al., 2025). These structural weaknesses are further intensified by deficiencies in skills, underdeveloped knowledge systems, and only moderate levels of digital literacy, all of which constrain productivity and impede access to financing and higher value markets (Shulthoni et al., 2025). As a result, the capacity of corporate sustainability strategy and intellectual capital to generate superior financial performance remains largely untapped (Paluseri et al., 2025), leaving many MSMEs unable to fully realise potential financial benefits.

Collectively, these conditions underscore the need for a systematic examination of the determinants shaping the financial performance of Indonesian MSMEs. Accordingly, this study investigates the influence of corporate sustainability strategy and intellectual capital on MSMEs' financial performance, with particular emphasis on the mediating roles of sustainability performance and green innovation practices, alongside the moderating effect of digital literacy. Addressing this research gap is critical for enhancing the resilience and competitiveness of Indonesian MSMEs, enabling them to respond effectively to sustainability imperatives while achieving enduring financial success. To achieve these objectives, the study is grounded in resource dependence theory (RDT), the knowledge-based view (KBV), the triple bottom line (TBL) framework, and environmental innovation theory. Together, these perspectives offer an integrated theoretical lens for understanding how dependence on external resources, the deployment of internal knowledge capabilities, and the alignment of economic, environmental, and social priorities collectively shape sustainability strategies and subsequent performance outcomes.

The remainder of this paper is organised as follows. Section 2 synthesises the relevant literature and outlines the theoretical foundations of the proposed research framework. Section 3 presents the study objectives and hypotheses. Section 4 details the research methodology, including design, sampling, measurement, and analytical procedures.

Section 5 reports the empirical findings, while Section 6 discusses the results in relation to prior studies and outlines theoretical and practical implications. Finally, Section 7 concludes by summarising the main findings, highlighting practical contributions, and identifying limitations and avenues for future research.

LITERATURE REVIEW

The body of scholarship examining sustainability and firm performance is anchored in multiple complementary theoretical lenses, each offering a distinct explanation for why organisations engage in sustainability-oriented activities and how such engagement influences performance outcomes. RDT posits that firms adopt sustainability-focused strategies as a means of managing environmental uncertainty, alleviating resource constraints, and securing access to critical external resources, a consideration that is particularly salient for resource-constrained MSMEs (Pfeffer & Salancik, 2015). In parallel, the KBV underscores the strategic importance of knowledge, skills, and intellectual assets, arguing that sustainability-related initiatives enhance organisational knowledge stocks and innovative capacity, thereby strengthening competitive positioning (Grant, 1996).

Complementing these perspectives, the TBL framework emphasises the necessity of aligning economic, social, and environmental objectives, suggesting that enduring organisational success is contingent upon value creation across all three dimensions (Elkington, 1997). In addition, environmental innovation theory (EIT) explains how firms pursue eco-oriented innovations to minimise environmental harm, comply with regulatory requirements, and exploit emerging market opportunities, ultimately transforming sustainability into a source of differentiation and performance advantage (Rennings, 2000). Collectively, these perspectives provide a coherent theoretical basis for analysing the interconnections among corporate sustainability strategy, intellectual capital, green innovation practices, and performance outcomes within the MSMEs context.

Corporate sustainability strategy (CSS), when viewed through the lens of RDT, extends beyond a narrow emphasis on economic returns by integrating social and environmental considerations into core organisational activities and decision-making processes (Adiguzel et al., 2025). It represents an organisational commitment to the simultaneous pursuit of economic viability, social responsibility, and environmental stewardship in support of sustainable development objectives (Adanma & Ogunbiyi, 2024). However, embedding sustainability within corporate strategy is inherently complex, as organisations must continuously reconcile tensions among these interrelated dimensions (Annesi et al., 2025). A genuinely sustainability-oriented strategy should permeate all strategic domains, ranging from product development to market expansion, thereby ensuring that growth initiatives remain consistent with sustainability principles (Khan et al., 2024). Despite strong theoretical agreement regarding the strategic

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relevance of CSS, empirical findings on its performance implications remain inconclusive. While several studies report positive performance, effects associated with sustainability-oriented strategies (Hermundsdottir & Aspelund, 2022; Fang et al., 2026), others identify weak, inconsistent, or statistically insignificant relationships (Abdullah et al., 2024; Akomea et al., 2023; Yadav et al., 2023). These inconsistencies are often attributed to differences in the performance indicators employed across studies (Alodat & Hao, 2025). Recent research suggests that financial performance indicators and forward-looking sales expectations provide more robust measures of long-term success, as they capture both current market competitiveness and future growth prospects (Rubio-Andrés et al., 2025). Accordingly, examining CSS as a strategic mechanism for improving financial performance is particularly pertinent for MSMEs, whose limited resources frequently restrict the scope and depth of sustainability adoption.

Intellectual capital (IC), grounded in the KBV, is widely acknowledged as a fundamental strategic asset underpinning value creation and sustained competitive advantage (Di Vaio et al., 2024). IC comprises human capital, encompassing employees' knowledge, skills, and creative capabilities, relational capital, reflecting relationships with customers and external stakeholders, and structural capital, which includes organisational systems, routines, and codified knowledge assets. Collectively, these components shape firms' innovative capacity and long-term competitiveness (Cabrilo et al., 2024). A substantial body of empirical research demonstrates that IC contributes to enhanced innovation outcomes and operational efficiency, which subsequently translate into superior financial performance (Gidage & Bhide, 2025; Mansour et al., 2024). This relationship is especially pronounced within MSMEs, where organisational success is heavily dependent on individual expertise, adaptive routines, and strong stakeholder ties, positioning IC as a critical determinant of performance (Asiaei et al., 2022).

Within MSMEs, human capital facilitates creative problem-solving, relational capital sustains customer and partner networks, and structural capital supports scalability and innovation-led growth. Despite its recognised importance, much of the existing literature treats IC primarily as a general source of competitive advantage (Marulanda-Grisales & Vera-Acevedo, 2022), with comparatively limited attention devoted to its direct financial implications, including profitability and financial growth, in MSMEs. This gap underscores the need to examine how IC can be strategically mobilised to enhance financial performance under conditions of resource constraint. Framing IC as a central driver of financial performance is therefore both theoretically consistent with the KBV and practically relevant for fostering sustainable growth in MSMEs. Sustainability performance, rooted in the TBL framework, expands the concept of organisational performance by integrating economic, environmental, and social dimensions. This approach emphasises that firms should not focus exclusively on financial outcomes but must also account for their broader societal and ecological

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responsibilities (Hermundsdottir & Aspelund, 2022). From this perspective, the effective execution of CSS requires organisations to systematically assess, monitor, and manage sustainability performance across multiple dimensions (Guerra-Lombardi oulhaga et al., 2024). Sustainability performance thus reflects the degree to which firms achieve a balanced integration of social, environmental, and economic outcomes in support of sustainable development objectives (Andersson et al., 2022). Although sustainability-oriented strategies have been widely examined within this framework, empirical evidence remains mixed, with prior studies reporting positive, insignificant, or inconclusive associations with organisational performance (Aladwan et al., 2025; Lee et al., 2023; Rubio-Andrés et al., 2025).

Building on the TBL perspective, the direct linkage between sustainability performance and financial performance warrants attention, as sustainability-oriented initiatives may simultaneously enhance economic returns while mitigating negative social and environmental externalities (Adomako & Tran, 2022). Liu (2025) indicates that sustainability-related outcomes such as waste reduction, improved resource efficiency, and enhanced product quality contribute not only to stronger economic performance but also to reputational gains. Consequently, situating sustainability performance within the TBL framework supports the argument that it may function as a key mechanism reinforcing the relationship between CSS and financial performance, as improvements across social, environmental, and economic domains collectively strengthen market outcomes.

Green innovation practices (GIP), grounded in EIT, refer to organisational processes aimed at developing products, technologies, or operational practices that reduce environmental impact while preserving or enhancing competitiveness (Jiang et al., 2025). EIT contends that firms can convert environmental challenges into strategic opportunities by innovating in ways that improve ecological outcomes and simultaneously support long-term financial performance (Koutsouradis et al., 2026). Prior empirical studies indicate that the adoption of GIP yields tangible benefits, including lower operating costs, improved resource efficiency, and enhanced corporate reputation, all of which contribute to improved firm performance (Fu et al., 2023; Lee et al., 2023). For instance, investments in energy-efficient technologies or sustainable input materials can reduce production costs while increasing attractiveness to environmentally conscious consumers (Celestin et al., 2024).

Within the MSMEs context, the implementation of GIP may operate through a dual mechanism by lowering costs through resource efficiency and strengthening market differentiation through sustainability-oriented offerings (Widjajanti et al., 2025). Nevertheless, the literature remains inconclusive regarding whether the financial benefits of GIP observed in large manufacturing or technology-intensive firms extend to MSMEs. This uncertainty is significant, given that MSMEs are subject to increasing external pressure to demonstrate environmental responsibility while simultaneously

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possessing inherent flexibility and innovative potential that may facilitate GIP adoption. Consistent with EIT, it can be argued that MSMEs engaging in GIP are better positioned to enhance financial performance through cost reductions, efficiency gains, and strengthened market positioning. Extending EIT to the MSMEs context therefore provides a sound theoretical basis for proposing a positive association between GIP and financial performance.

Digital literacy has emerged as a critical organisational capability in contemporary business environments. It encompasses the ability to locate, evaluate, and apply digital information, collaborate via digital platforms, and engage in problem-solving through digital technologies (Ibrahim & Aduah, 2025). It also includes awareness of data security, privacy, and responsible technology use, enabling employees to utilise digital tools ethically and effectively in pursuit of organisational objectives (Adejuwon & Ojeagbase, 2023). Within organisations, higher levels of digital literacy enhance employees' capacity to adapt to technological change, interact effectively with digital systems, and leverage digital platforms to support innovation, collaboration, and sustainability-related outcomes (Ibrahim & Aduah, 2025).

In relation to CSS, digital literacy can substantially amplify the effectiveness of sustainability initiatives. A digitally competent workforce is better equipped to employ technology-enabled systems for monitoring environmental impacts, reporting sustainability metrics, and engaging stakeholders through digital channels (Jagannathan, 2021). Higher levels of digital literacy also facilitate adaptation to evolving digital requirements in sustainability reporting and regulatory compliance, thereby strengthening alignment between strategic intent and sustainability performance. Similarly, with respect to IC, digital literacy enhances employees' ability to generate, share, and apply knowledge that supports the implementation of GIP. Human capital endowed with strong digital capabilities is more effective in utilising digital knowledge management systems, while structural capital, including digital databases and collaborative platforms, delivers greater value when employees possess adequate digital skills (Ibrahim & Aduah, 2025). As a result, elevated levels of digital literacy enable the knowledge embedded within IC to be more effectively channelled towards green innovation outcomes. The moderating role of digital literacy is therefore critical in the relationships among IC, GIP, CSS, and sustainability performance. When digital literacy is high, employees are better able to implement GIP efficiently and communicate their value to environmentally conscious markets, thereby reinforcing both environmental and financial outcomes (Akshita et al., 2024). Conversely, limited digital literacy may constrain the adoption and impact of GIP, as employees may struggle to exploit digital tools that facilitate resource efficiency, performance monitoring, and the diffusion of innovation.

In summary, although prior research underscores the importance of sustainability and innovation for enhancing organisational outcomes, much of the existing evidence is

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derived from studies of large firms in developed economies. Research focusing on MSMEs in emerging economies such as Indonesia remains comparatively limited, despite the distinct challenges these firms face, including resource scarcity, weak institutional support, and restricted access to finance (Sinha et al., 2024). Moreover, while CSS has been widely examined as a driver of competitiveness, its influence on financial performance within MSMEs, particularly in contexts where sustainability adoption is often informal and underdeveloped, has not been adequately explored. Similarly, although the role of IC in supporting innovation and long-term growth is well established, few studies have integrated IC with sustainability-oriented perspectives to examine their combined effects on MSMEs financial performance. The mediating functions of sustainability performance and GIP, as mechanisms through which strategic orientation and resource endowments translate into measurable financial outcomes, also remain insufficiently investigated in this context. Finally, while digital literacy is increasingly recognised as a facilitator of efficiency, innovation, and market access, its capacity to moderate the relationships among strategy, resources, and sustainability-driven outcomes has received limited empirical attention. These gaps highlight the need for a more comprehensive framework that captures how CSS and IC jointly shape MSMEs financial performance through interconnected mediating and moderating mechanisms within the Indonesian context.

AIM AND HYPOTHESES

This study examines the principal determinants shaping the financial performance of MSMEs in Indonesia, with a specific focus on corporate sustainability strategy, intellectual capital, sustainability performance, green innovation practices, and digital literacy. By analysing both direct relationships and indirect pathways, the study addresses important gaps in existing research concerning MSMEs and their financial outcomes. To ensure a holistic analytical perspective, the proposed framework synthesises multiple theoretical foundations, namely resource dependence theory, the knowledge-based view, the triple bottom line framework, and environmental innovation theory, within the distinctive economic and cultural setting of Indonesia. This integrated approach is intended to yield insights of relevance for both academic inquiry and managerial practice. Drawing on the preceding literature review and the conceptual framework presented in Figure 1, the study formulates a series of testable hypotheses. Accordingly, based on the established theoretical foundations, the following hypotheses are proposed.

H1: *Corporate sustainability strategy significantly influences the financial performance of the firm.*
H2: *Corporate sustainability strategy significantly influences the sustainability performance of the firm.*
H3: *Intellectual capital significantly influences the financial performance of the firm.*

H4: *Intellectual capital significantly influences the green innovation practices of the firm.*
H5: *Sustainability performance significantly influences the financial performance of the firm.*
H6: *Green innovation practices significantly influence the financial performance of the firm.*
H7: *Sustainability performance mediates the relationship between corporate sustainability strategy and financial performance of the firm.*
H8: *Green innovation practices mediate the relationship between intellectual capital and financial performance of the firm.*
H9: *Digital literacy moderates the relationship between corporate sustainability strategy and sustainability performance.*
H10: *Digital literacy moderates the relationship between intellectual capital and green innovation practices."*

Figure 1 illustrates the theoretical framework that forms the conceptual foundation of this study.

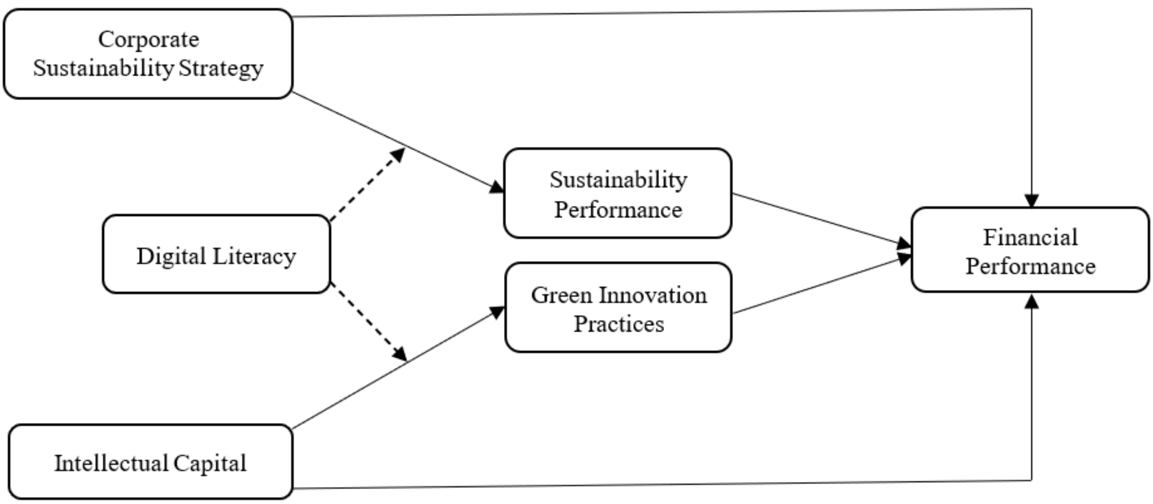

Figure 1: Theoretical Framework

METHODOLOGY

This study employs a quantitative research design to analyse the relationships among corporate sustainability strategy, intellectual capital, sustainability performance, green innovation practices, digital literacy, and the financial performance of MSMEs in Indonesia. To ensure measurement validity and reliability, all constructs were operationalised using indicators adapted from well-established and empirically validated scales reported in prior studies. CSS and IC were specified as exogenous variables, sustainability performance (SP) and GIP as mediating variables, digital

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literacy (DL) as a moderating variable, and financial performance (FP) as the endogenous variable. The selection of measurement items was informed by existing literature (Ali et al., 2025; Aljuboori et al., 2022; Cantele & Zardini, 2018; Gidage & Bhide, 2025; Rubio-Andrés et al., 2025; Wang et al., 2021). All indicators were measured using a five-point Likert scale, ranging from 1 denoting strong disagreement to 5 indicating strong agreement. In addition, demographic items were included to characterise respondents and contextualise the sample.

The target population comprised approximately 243,972 MSMEs registered under the Jakarta Entrepreneur (Jakpreneur) programme as of 2023. The minimum required sample size was calculated using the formula proposed by Yamane (1967), resulting in a threshold of 260 respondents. This sample size is considered sufficient for studies involving large populations and satisfies recommended requirements for multivariate statistical techniques (Hair et al., 2019). Purposive sampling was employed to collect data from MSME owners and managers operating in Jakarta, Indonesia, during November. Although this non-probability sampling approach limits statistical generalisation, it is appropriate for the present context, as it ensures participation from respondents with decision-making authority and direct involvement in sustainability and innovation-related activities (Etikan et al., 2016). In total, 304 questionnaires were returned via an online survey, of which 296 responses were retained for analysis following data screening and cleaning procedures. This final sample size meets established guidelines for the application of PLS-SEM and supports robust statistical inference (Henseler et al., 2016).

Several diagnostic procedures were conducted to enhance the robustness of the empirical results. Multicollinearity among predictor constructs was assessed using variance inflation factor values, all of which were below the conservative threshold of 3.3. In addition, a bootstrapping procedure with 5,000 resamples was applied to examine the stability of path coefficients and the significance of hypothesised relationships. Reliability assessments further confirmed the consistency of the measurement results across these checks. Collectively, these procedures strengthen the credibility and methodological rigour of the study findings. The final dataset consisted of 296 respondents, with their demographic characteristics summarised in Table 1. The sample predominantly comprised privately or individually owned MSMEs operating within the service sector. These firms were generally small in scale, relatively young, and characterised by modest levels of investment and turnover. Most respondents occupied middle to upper managerial positions, possessed limited managerial experience, and held bachelor's or postgraduate qualifications. The demographic profile was largely female, accounting for 72.5% of respondents, and predominantly young, with 82% under the age of 30. This distribution reflects the growing influence of younger professionals in shaping sustainability initiatives and innovation practices within Indonesian MSMEs.

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Table 1: Background Information of the Respondents (N = 296)

Demographic variables	Category	Frequency	Percent (%)
Gender	Male	82	27.7
	Female	214	72.3
Age	Below 30 Years	242	81.8
	30-40 Years	26	8.7
	Above 50 Years	28	9.5
Educational Level	Bachelor's Degree	134	45.2
	Master's Degree or Higher	81	27.3
	Doctoral Level	27	9.1
	Professional	54	18.4
Managerial Position	CEO/MD/GM/VP/CFO/COO	53	17.9
	Directors	28	9.4
	Senior Managers	54	18.3
	Managers	80	27.1
	Senior Executives	81	27.3
Managerial Experience	Up to 5 Years	214	72.1
	6-10 Years	27	9.1
	11-20 Years	29	10
	Over 20 Years	26	8.8
Company Type	Ownership	108	36.4
	State-Owned	27	9.2
	Private	106	35.8
	Others	55	18.6
Number of Employees	Up to 50	187	63.1
	51-100	54	18.3
	101-500	28	9.4
	Over 500	27	9.2
Firm Age	Less than 3 Years	108	36.4
	3-5 Years	81	27.4
	6-10	27	9.1
	More than 15 Years	80	27.1

In addition, the study utilised PLS-SEM as the principal analytical approach. This technique was chosen because of its strong suitability for analysing complex research models that incorporate multiple latent constructs, mediating mechanisms, and moderating effects, as highlighted by Totok et al. (2025). PLS-SEM enables the concurrent examination of direct and indirect relationships and is particularly appropriate for prediction-oriented research designs involving moderate sample sizes (Henseler et al., 2016). The analytical procedure was implemented in two sequential phases. In the first phase, the measurement model was evaluated to confirm the reliability and validity of the constructs. In the second phase, the structural model was examined to assess the proposed relationships among the study variables. This systematic two-stage procedure enhanced methodological rigour and reinforced the robustness and credibility of the empirical results.

RESULTS

Data analysis was performed using SmartPLS 4, following a two-stage procedure that commenced with the evaluation of the measurement model, followed by the assessment of the structural model. In the initial stage, the reliability and validity of all constructs were examined. Indicator reliability was assessed through factor loadings, which indicate the extent to which each item accurately reflects its underlying latent construct. Consistent with Hair Jr. and Anderson (2009), factor loadings of 0.50 or higher are deemed acceptable, while values exceeding 0.70 are considered ideal; all items in the present study surpassed these thresholds, confirming robust indicator reliability.

Table 2: Reliability Analysis

Variables	Items	Loadings	CA	rho_A	CR	AVE
CSS	CSS1	0.836	0.861	0.882	0.898	0.638
	CSS2	0.816				
	CSS3	0.808				
	CSS4	0.760				
	CSS5	0.771				
IC	IC1	0.842	0.795	0.854	0.850	0.534
	IC2	0.777				
	IC3	0.691				
	IC4	0.710				
	IC5	0.614				
DL	DL1	0.579	0.761	0.777	0.839	0.513
	DL2	0.730				
	DL3	0.724				
	DL4	0.766				
SP	SP1	0.751	0.785	0.789	0.861	0.607
	SP2	0.774				
	SP3	0.800				
	SP4	0.791				
GIP	GIP1	0.802	0.887	0.889	0.917	0.690
	GIP2	0.835				
	GIP3	0.859				
	GIP4	0.833				
	GIP5	0.823				
FP	FP1	0.873	0.876	0.880	0.915	0.730
	FP2	0.879				
	FP3	0.815				
	FP4	0.849				

Construct-level internal consistency was assessed using Cronbach's Alpha (CA) and Composite Reliability (CR). As presented in Table 2, all constructs exceeded the recommended CA and CR thresholds (Hair Jr. & Anderson, 2009), demonstrating satisfactory internal consistency and reliability. Convergent validity was further evaluated using the Average Variance Extracted (AVE), where values above 0.50

indicate that a construct explains more than half of the variance in its associated indicators (Fornell & Larcker, 1981). The results indicate that all constructs satisfy this criterion, confirming adequate convergent validity.

Discriminant validity was assessed using both the Fornell–Larcker criterion and the Heterotrait–Monotrait (HTMT) ratio. As presented in Table 3, the square root of the AVE for each construct exceeded its correlations with all other constructs, thereby satisfying the Fornell–Larcker criterion. Additionally, all HTMT values were below the recommended threshold of 0.85, indicating adequate discriminant validity (Henseler et al., 2016). These findings confirm that each construct is empirically distinct from the others. Overall, the measurement model demonstrates strong reliability, convergent validity, and discriminant validity, establishing that the constructs are conceptually sound and statistically robust, and appropriate for subsequent evaluation within the structural model.

Table 3: Validity Analysis

Variables	CSS	DL	FP	GIP	IC	SP
CSS	0.799					
DL	0.059	0.716				
FP	-0.449	0.508	0.854			
GIP	-0.358	0.617	0.828	0.830		
IC	0.759	0.213	-0.357	-0.299	0.731	
SP	-0.182	0.655	0.709	0.775	-0.060	0.779

Following the completion of the measurement model assessment, the evaluation of structural model fit and hypothesised relationships was undertaken. Prior to examining these relationships, potential issues of multicollinearity and common method bias (CMB) were addressed, as both can compromise the validity of research findings (Hair Jr et al., 2017). Multicollinearity was assessed using the Variance Inflation Factor (VIF), with values below 5 deemed acceptable (Hair Jr et al., 2017). As indicated in Table 4, the highest VIF observed was 2.410, well within the recommended threshold, confirming that multicollinearity does not pose a concern. CMB was examined via Harman's single-factor test, which evaluates whether a single factor accounts for a dominant proportion of variance, potentially distorting estimated relationships. Following Kock (2015), CMB is considered negligible if a single factor explains less than 50% of total variance. In this study, the first factor explained 28.16% of variance, indicating minimal impact of CMB on the validity of results. Additionally, endogeneity was assessed using the Gaussian copula approach (Park & Gupta, 2012). The copula terms were not statistically significant ($p > 0.05$), suggesting that endogeneity is unlikely to bias the estimated effects.

Overall model fit was evaluated using three widely accepted criteria: the coefficient of determination (R^2), the standardized root mean square residual (SRMR), and Stone-

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Geisser's Q^2 predictive relevance statistic. The R^2 value indicates the proportion of variance in the endogenous construct explained by the exogenous variables, with values exceeding 0.20 generally considered meaningful in business research (Hair et al., 2011). The model accounted for 69.4% of the variance in FP, demonstrating strong explanatory power. Model fit was further assessed using SRMR, which measures the discrepancy between observed and model-implied correlation matrices (Hair et al., 2021). The SRMR value of 0.069 is below the recommended threshold of 0.080, indicating acceptable fit (Hu & Bentler, 1999). Predictive relevance was evaluated using Q^2 through the blindfolding procedure, where values greater than zero indicate adequate predictive capability. As shown in Table 4, Q^2 exceeded zero, confirming the model's predictive relevance (Hair & Anderson, 2019). Collectively, these metrics indicate that the structural model exhibits satisfactory fit and predictive accuracy, making it appropriate for hypothesis testing.

The structural model results (Table 4) reveal that CSS exerts a negative and significant effect on both FP (H1) and SP (H2). Similarly, IC demonstrates a negative and highly significant impact on FP (H3) and GIP (H4). Conversely, SP has a positive and significant influence on FP (H5), while GIP also exerts a strong positive and significant effect on FP (H6). Regarding mediation effects, SP partially mediates the relationship between CSS and FP (H7), whereas GIP mediates the relationship between IC and FP (H8).

Table 4: Results from PLS Bootstrapping

Hypothesis		Std. Beta	Std. Dev.	T-Values	P-Values	Decision	VIF	SRMR	Q^2
H1	CSS → FP	-0.028	0.014	1.982	$p<0.05$ (0.048)	Accepted	1.910	0.069	0.553
H2	CSS → SP	-0.166	0.048	3.445	$p<0.01$ (0.001)	Accepted	1.540		
H3	IC → FP	-0.266	0.035	7.626	$p<0.001$ (0.000)	Accepted	1.410		
H4	IC → GIP	-0.382	0.039	9.669	$p<0.001$ (0.000)	Accepted	1.550		
H5	SP → FP	0.169	0.061	2.761	$p<0.01$ (0.006)	Accepted	2.160		
H6	GIP → FP	0.696	0.056	12.428	$p<0.001$ (0.000)	Accepted	2.410		
H7	CSS → SP → FP	-0.028	0.014	1.982	$p<0.05$ (0.048)	Accepted			
H8	IC → GIP → FP	-0.266	0.035	7.626	$P<0.001$ (0.000)	Accepted			
H9	DL x CSS → SP	0.438	0.049	8.976	$P<0.001$ (0.000)	Accepted			
H10	DL x IC → GIP	0.327	0.042	7.804	$p<0.001$ (0.000)	Accepted			

The moderating role of DL was also supported. The interaction term DL × CSS significantly strengthens the relationship between CSS and SP (H9), and DL × IC significantly enhances the association between IC and GIP (H10). These findings highlight the importance of digital literacy in amplifying the effectiveness of

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sustainability strategies and intellectual capital in driving innovation and financial outcomes within MSMEs.

DISCUSSION

This study investigates the determinants of MSMEs' financial performance by adopting a comprehensive framework that integrates corporate sustainability strategy, intellectual capital, sustainability performance, green innovation practices, and digital literacy. The proposed model explains 69.6% of the variance in FP, demonstrating substantial explanatory power and advancing understanding of the drivers of financial performance beyond prior studies that examined these factors in isolation. Ten hypotheses were formulated within the research model, all of which were empirically supported. For analytical clarity, the hypotheses were categorised into two groups. The first group examined direct associations among constructs.

Empirical results reveal that both CSS and IC exert negative and significant direct effects on FP, as well as on SP and GIP, respectively. This indicates that while sustainability-oriented initiatives and knowledge-based resources are strategically valuable, their immediate financial impact is limited in resource-constrained MSMEs. One plausible explanation is the high initial costs, technical requirements, and organisational adjustments associated with sustainability practices, which often delay tangible financial returns. These findings align with previous research (Chang et al., 2022; Arhinful et al., 2025), highlighting that sustainability investments generally yield long-term, rather than short-term, economic benefits. Importantly, the present study extends these insights to the context of emerging economies, where capital scarcity, technological limitations, and weak institutional support intensify the short-term cost-benefit imbalance. This demonstrates that in developing contexts, the pursuit of CSS and IC can initially strain FP before generating strategic advantages, emphasising the need for phased or incentivised sustainability frameworks to alleviate immediate financial pressures on MSMEs.

Conversely, SP and GIP exhibit significant positive effects on FP, indicating that effective integration of sustainability principles into operations and innovation processes allows MSMEs to translate environmental responsibility into measurable financial gains. Green innovation enhances process efficiency, reduces resource wastage, and strengthens product differentiation, collectively improving competitive positioning. These findings corroborate prior studies (Nagiah & Mohd Suki, 2024; Robina-Ramírez et al., 2025) demonstrating that sustainability-driven innovation improves corporate reputation and attracts environmentally conscious consumers and investors. The study contributes novelty by empirically validating these effects within the MSME context of an emerging economy, showing that even smaller firms can achieve superior FP through strategic investment in GIP. This underscores the importance of aligning sustainability objectives with innovation strategies to create both ethical and financially viable outcomes.

The second group of hypotheses examined indirect effects, offering insights into the mechanisms through which sustainability outcomes influence FP. SP was found to partially mediate the relationship between CSS and FP, suggesting that the financial benefits of sustainability strategies are largely realised through enhanced environmental and social performance rather than immediate economic gains. Engagement in sustainability practices strengthens legitimacy, stakeholder trust, and corporate reputation, which gradually translate into improved FP. These findings align with prior research (Michalski, 2024; Nicolò et al., 2025) indicating that sustainability-driven initiatives generate long-term value via non-financial channels. This study extends the understanding by validating this mediating mechanism within MSMEs in an emerging economy, highlighting the strategic importance of consistent environmental and social commitments to achieve sustained financial outcomes.

Similarly, GIP mediates the relationship between IC and FP, emphasising the critical role of innovation-oriented capabilities in converting intangible resources into tangible economic returns. IC elements such as managerial expertise, employee knowledge, and organisational learning enhance FP when leveraged toward sustainable innovations. This finding aligns with environmental innovation theory, which posits that performance outcomes emerge from the synergistic interaction of knowledge, innovation, and environmental responsiveness rather than linear causal paths (Rennings, 2000). Previous research (Suengkamolpisut et al., 2025; Trevlopoulos et al., 2021) supports the notion that IC fosters eco-efficient innovations that sustain competitiveness. The current study extends these insights by demonstrating that IC alone is insufficient for financial success in MSMEs unless coupled with GIP, highlighting an integrative pathway linking knowledge resources, sustainability, and profitability in resource-constrained settings.

The moderating role of DL provides additional theoretical and practical contributions. Significant interaction effects of DL with both CSS and IC indicate that digitally proficient MSMEs are better able to translate strategic intent into effective sustainability and innovation outcomes. Digital literacy enhances capabilities to collect, process, and utilise sustainability-related information, as well as to integrate knowledge-based resources into eco-efficient operations. These results align with prior studies (Jain, 2026; Goraya et al., 2025) emphasising that digital competence facilitates data-driven decision-making, accelerates innovation diffusion, and supports real-time performance monitoring. The present study extends this understanding by empirically demonstrating that DL strengthens the impact of strategic and intellectual resources on sustainability outcomes in MSMEs, where technological and financial limitations are prevalent. This highlights DL as a key enabler bridging sustainability ambition and practical implementation, reinforcing adaptive capacity and competitive advantage in a digitalising business environment.

Moreover, GIP emerged as the strongest predictor of FP (β = 0.696), followed by SP (β = 0.169), indicating that investments in eco-friendly technologies, resource-efficient processes, and environmentally responsible practices have a dominant effect on MSMEs' financial outcomes. This underscores the critical role of innovation-driven sustainability in achieving profitability and competitive advantage. Theoretically, the study advances understanding by integrating RDT, KBV, TBL, and EIT into a unified framework explaining MSMEs' FP. The findings highlight that the effectiveness of sustainability strategies and IC is contingent upon firms' digital and innovative capabilities, which convert strategic intent into tangible outcomes. Practically, the study emphasises the need for MSME managers and policymakers to enhance DL and innovation capacity to enable sustainable growth. Aligning sustainability objectives with FP allows MSMEs to strengthen competitiveness, resilience, and long-term value creation in Indonesia's evolving business landscape.

Despite these contributions, several limitations warrant consideration. The sample largely comprised younger, highly educated respondents, which may limit generalisability as such groups often exhibit higher digital competence and environmental sensitivity. The cross-sectional design constrains causal inference, suggesting the value of longitudinal studies to capture the evolution of sustainability strategies and their long-term effects on FP. Given the specific institutional and cultural context of Indonesia, cross-country comparisons among emerging economies could enhance external validity. Future research should incorporate additional contextual factors such as environmental regulations, access to green finance, and supply chain collaboration to better understand how GIP drives financial and sustainability performance. Employing mixed-method approaches could further enrich insights by uncovering mechanisms linking sustainability orientation to measurable organisational outcomes.

CONCLUSION

This study investigates the primary factors influencing MSMEs' financial performance by examining the integrated roles of corporate sustainability strategy, intellectual capital, sustainability performance, green innovation practices, and digital literacy. The results reveal that CSS and IC may initially exert a constraining effect on FP due to limited resources and capabilities; however, SP and GIP ultimately drive positive financial outcomes. These findings suggest that the strategic and intellectual resources of MSMEs achieve their full value when leveraged through sustainability-focused and innovation-oriented practices. Moreover, DL enhances this process by enabling MSMEs to implement CSS more effectively and to translate IC into tangible innovative outputs. Theoretically, this study advances understanding by synthesizing RDT, KBV, TBL, and EIT into a unified explanatory framework for MSMEs' FP. The results emphasise that sustainable financial success in MSMEs requires a strategic balance of sustainability, innovation, and digital proficiency to strengthen resilience, operational efficiency, and competitiveness within dynamic business contexts. For future research, longitudinal studies or cross-country comparative analyses could provide deeper insights into evolving sustainability dynamics across different institutional settings. Additionally, integrating regulatory frameworks, access to green finance, and collaborative practices could further elucidate how MSMEs operationalise sustainability to achieve both financial and environmental advantages.

REFERENCES

Abdullah, A., Yamak, S., Korzhenitskaya, A., Rahimi, R., & McClellan, J. (2024). Sustainable development: The role of sustainability committees in achieving ESG targets. *Business Strategy and the Environment*, *33*(3), 2250-2268. https://doi.org/10.1002/bse.3596

Adanma, U. M., & Ogunbiyi, E. O. (2024). A comparative review of global environmental policies for promoting sustainable development and economic growth. *International Journal of Applied Research in Social Sciences*, *6*(5), 954-977. https://doi.org/10.51594/ijarss.v6i5.1147

Adejuwon, F. E., & Ojeagbase, I. O. (2023, May). Role of cybersecurity education in promoting ethical and responsible use of technology for sustainable development. In *Lead City University Postgraduate Multidisciplinary Conference Proceedings* (Vol. 1, No. 3, pp. 163-186).

Adiguzel, Z., Sonmez Cakir, F., & Özbay, F. (2025). Big data analytics capability and sustainability in company innovation. *International Journal of Innovation Science*. https://doi.org/10.1108/IJIS-08-2024-0231

Adomako, S., & Tran, M. D. (2022). Sustainable environmental strategy, firm competitiveness, and financial performance: Evidence from the mining industry. *Resources Policy*, *75*, 102515. https://doi.org/10.1016/j.resourpol.2021.102515

Akomea, S. Y., Agyapong, A., Ampah, G., & Osei, H. V. (2023). Entrepreneurial orientation, sustainability practices and performance of small and medium enterprises: evidence from an emerging economy. *International Journal of Productivity and Performance Management*, *72*(9), 2629-2653. https://doi.org/10.1108/IJPPM-06-2021-0325

Akshita, Mahajan, S., Jarolia, P., & Pandey, P. K. (2024). Digital sustainability and corporate governance: examining the integration of information technology in green marketing strategies. *International Journal of Global Environmental Issues*, *23*(4), 448-469. https://doi.org/10.1504/IJGENVI.2024.144466

Aladwan, M., Samara, H., Alsinglawi, O., Elamer, A. A., & Moustafa, M. W. (2025). Do women on boards drive corporate sustainability? Evidence from the European Union. *Corporate Social Responsibility and Environmental Management*, *32*(6), 8144-8160. https://doi.org/10.1002/csr.70106

Ali, A., Yang, Q., Ali, A., Ali, Z., & Noman, M. (2025). How and when AI-driven capabilities foster organizational sustainability: A moderated mediation analysis of digital literacy and green HRM. *International Journal of Information Management*, *85*, 102956. https://doi.org/10.1016/j.ijinfomgt.2025.102956

Aljuboori, Z. M., Singh, H., Haddad, H., Al-Ramahi, N. M., & Ali, M. A. (2022). Intellectual Capital and Firm Performance Correlation: The Mediation Role of Innovation Capability in Malaysian Manufacturing SMEs Perspective. *Sustainability*, *14*(1), 154. https://doi.org/10.3390/su14010154

Alodat, A. Y., & Hao, Y. (2025). Environmental, social and governance (ESG) disclosure and firm performance: moderating role of board gender diversity and sustainability committee. *Sustainable Development*, *33*(1), 636-651. https://doi.org/10.1002/sd.3126

Andersson, S., Svensson, G., Molina-Castillo, F. J., Otero-Neira, C., Lindgren, J., Karlsson, N. P., & Laurell, H. (2022). Sustainable development—Direct and indirect effects between economic, social, and environmental dimensions in business practices. *Corporate Social Responsibility and Environmental Management*, *29*(5), 1158-1172. https://doi.org/10.1002/csr.2261

Annesi, N., Battaglia, M., Ceglia, I., & Mercuri, F. (2025). Navigating paradoxes: Building a sustainable strategy for an integrated ESG corporate governance. *Management Decision*, *63*(2), 531-559. https://doi.org/10.1108/MD-10-2023-2006

ANTARA. (2025). Indonesia's MSME turnover falls, govt to reassess procurement policy. . https://en.antaranews.com/news/361673/indonesias-msme-turnover-falls-govt-to-reassess-procurement-policy

Aprilia, N., Subroto, W. T., & Sakti, N. C. (2025). The role of small and medium enterprises (SMEs) in supporting the people's economy in Indonesia. *International Journal of Research and Scientific Innovation, XI (XII)*, 368-376. https://doi.org/10.51244/IJRSI.2024.11120036

Arhinful, R., Obeng, H. A., Mensah, L., & Mensah, C. C. (2025). Signaling sustainability: The impact of sustainable finance on dividend policy among firms listed on the London stock exchange. *Business Strategy and the Environment*, *34*(7), 8001-8019. https://doi.org/10.1002/bse.70020

Asiaei, K., Jusoh, R., Barani, O., & Asiaei, A. (2022). How does green intellectual capital boost performance? The mediating role of environmental performance measurement systems. *Business Strategy and the Environment*, *31*(4), 1587-1606. https://doi.org/10.1002/bse.2971

Cabrilo, S., Dahms, S., & Tsai, F.-S. (2024). Synergy between multidimensional intellectual capital and digital knowledge management: Uncovering innovation performance complexities. *Journal of Innovation & Knowledge*, *9*(4), 100568. https://doi.org/10.1016/j.jik.2024.100568

Cantele, S., & Zardini, A. (2018). Is sustainability a competitive advantage for small businesses? An empirical analysis of possible mediators in the sustainability–financial performance relationship. *Journal of Cleaner Production*, *182*, 166-176. https://doi.org/10.1016/j.jclepro.2018.02.016

Carayannis, E. G., Dumitrescu, R., Falkowski, T., Papamichail, G., & Zota, N. R. (2025). Enhancing SME resilience through artificial intelligence and strategic foresight: A framework for sustainable competitiveness. *Technology in Society*, *81*, 102835. https://doi.org/10.1016/j.techsoc.2025.102835

Celestin, M., Vasuki, M., Sujatha, S., & Kumar, A. D. (2024). Implementing green technologies to reduce environmental impact: Economic and competitive advantages of eco-friendly practices. *International Journal of Scientific Research and Modern Education*, *9*(2), 33-39. https://doi.org/10.5281/zenodo.13879990

Chang, X., Fu, K., Jin, Y., & Liem, P. F. (2022). Sustainable finance: ESG/CSR, firm value, and investment returns. *Asia-Pacific Journal of Financial Studies*, *51*(3), 325-371. https://doi.org/10.1111/ajfs.12379

Di Vaio, A., Zaffar, A., & Chhabra, M. (2024). Intellectual capital through decarbonization for achieving Sustainable Development Goal 8: a systematic literature review and future research directions. *Journal of Intellectual Capital*, *25*(7), 54-86. https://doi.org/10.1108/JIC-05-2024-0131

Elkington, J. (1997). The triple bottom line. *Environmental management: Readings and cases*, *2*(1997), 49-66. https://books.google.com.pk/books?id=hRJGrsGnMXcC&dq=Elkington,+J.+(1997)

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, *5*(1), 1-4. https://doi.org/10.11648/j.ajtas.20160501.11

Fang, M., Yuen, K. F., Xie, D., Wang, X., & Pang, Q. (2026). Are we on the same page? Effects of sustainability orientation (in) congruence on sustainable shipping performance. *Operations Management Research*, *19*(1), 1-18. https://doi.org/10.1007/s12063-025-00577-6

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, *18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Fu, H., Huang, P., Xu, Y., & Zhang, Z. (2023). Digital trade and environmental sustainability: the role of financial development and ecological innovation for a greener revolution in China. *Economic research-Ekonomska istraživanja*, *36*(2). https://doi.org/10.1080/1331677X.2022.2125889

Gidage, M., & Bhide, S. (2025). Exploring the nexus between intellectual capital, green innovation, sustainability and financial performance in creative industry MSMEs. *Journal of Enterprising Communities: People and Places in the Global Economy*, *19*(3), 457-484. https://doi.org/10.1108/JEC-07-2024-0134

Goraya, M. A. S., Kemal, A. A., Xu, M., Shareef, M. A., & Akram, M. S. (2025). Leveraging digital transformation strategy and data-driven decision-making to improve organisational performance in a hostile environment. *Industrial*

Management & Data Systems, 1-28. https://doi.org/10.1108/IMDS-10-2024-1039

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic management journal*, *17*(S2), 109-122. https://doi.org/10.1002/smj.4250171110

Guerra-Lombardi, V., Hernández-Martín, R., & Padrón-Fumero, N. (2024). Drivers, barriers and key practices of corporate sustainability strategy implementation in hotels. *International Journal of Hospitality Management*, *120*, 103791. https://doi.org/10.1016/j.ijhm.2024.103791

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis* (8th ed.). Cengage. https://eli.johogo.com/Class/CCU/SEM/_Multivariate%20Data%20Analysis_Hair.pdf

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). An Introduction to Structural Equation Modeling. In J. F. Hair Jr, G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, & S. Ray (Eds.), *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook* (pp. 1-29). Springer International Publishing. https://doi.org/10.1007/978-3-030-80519-7_1

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139-152. https://doi.org/10.2753/MTP1069-6679190202

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, *31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis*, *1*(2), 107-123. https://doi.org/10.1504/IJMDA.2017.087624

Hair Jr., J. F., Black, W.C., Babin, B.J. , & Anderson, R. E. (2009). *Multivariate Data Analysis.* , (7th Edition ed.). Prentice Hall. . https://www.drnishikantjha.com/papersCollection/Multivariate%20Data%20Analysis.pdf

Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International marketing review*, *33*(3), 405-431. https://doi.org/10.1108/IMR-09-2014-0304

Hermundsdottir, F., & Aspelund, A. (2022). Competitive sustainable manufacturing - Sustainability strategies, environmental and social innovations, and their effects on firm performance. *Journal of Cleaner Production*, *370*, 133474. https://doi.org/10.1016/j.jclepro.2022.133474

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation*

Modeling: A Multidisciplinary Journal, *6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Ibrahim, M., & Aduah, E. W. (2025). Digital literacy, digital intelligence and small and medium enterprises'(SMEs) sustainability: The mediating role of digital technology usage. *Information Development*, 02666669251335001. https://doi.org/10.1177/02666669251335001

Jagannathan, S. (2021). The Digital Learning Opportunity. In *Reimagining Digital Learning for Sustainable Development* (pp. 17-35). Routledge.

Jain, A. (2026). Data-Driven Innovation Management using Emerging Digital Technologies. *International Journal of Advanced Research in Computer Science & Technology (IJARCST)*, *9*(1), 7-11. https://doi.org/10.15662/IJARCST.2026.0901002

Jiang, Y., Ding, X., & Zhang, J. (2025). Toward environmental efficiency: Analyzing the impact of green innovation initiatives in enterprises. *Managerial and Decision Economics*, *46*(2), 1206-1223. https://doi.org/10.1002/mde.4429

Khan, Z. A., Nawaz, I., & Kamran, H. (2024). Ecological strategic orientation and sustainable development. *Human Perspectives of Industry 4.0 Organizations*, 170-182. https://www.taylorfrancis.com/chapters/edit/10.1201/9781032616810-9

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec)*, *11*(4), 1-10. https://www.igi-global.com/article/common-method-bias-in-pls-sem/132843

Koutsouradis, G., Kounetas, K., & Tsekouras, K. (2026). A Configurational Approach to Eco-Innovation and Innovation Performance Relationship: Does Firm Size Matter?. *R&D Management*, *56*(1), 168-187. https://doi.org/10.1111/radm.70018

Lee, S. W. A., Rodrigs, M., Nathan, T. M., Rashid, M. A., & Al-Mamun, A. (2023). The relationship between the quality of sustainability reporting and corporate financial performance: A cross-sectional and longitudinal study. *Australasian Accounting, Business and Finance Journal*, *17*(2). https://doi.org/10.14453/aabfj.v17i2.04

Liu, S. (2025). Green management promotes long-term business competitive advantage through the resource-based view. *Total Quality Management & Business Excellence*, *36*(9-10), 946-973. https://doi.org/10.1080/14783363.2025.2499142

Mansour, M., Saleh, M. W., Marashdeh, Z., Marei, A., Alkhodary, D., Al-Nohood, S., & Lutfi, A. (2024). Eco-innovation and financial performance nexus: does company size matter?. *Journal of Open Innovation: Technology, Market, and Complexity*, *10*(1), 100244. https://doi.org/10.1016/j.joitmc.2024.100244

Marulanda-Grisales, N., & Vera-Acevedo, L. D. (2022). Intellectual capital and competitive advantages in Higher Education Institutions: An overview based on bibliometric analysis. *Journal of Turkish Science Education*, *19*(2), 525-544. https://doi.org/10.36681/tused.2022.135

Michalski, D. (2024). Operationalization of ESG-Integrated Strategy Through the Balanced Scorecard in FMCG Companies. *Sustainability*, *16*(21), 9174. https://doi.org/10.3390/su16219174

Nagiah, G. R., & Mohd Suki, N. (2024). Linking environmental sustainability, social sustainability, corporate reputation and the business performance of energy companies: insights from an emerging market. *International Journal of Energy Sector Management*, *18*(6), 1905-1922. https://doi.org/10.1108/IJESM-06-2023-0003

Nicolò, G., Raimo, N., Rella, A., & Vitolla, F. (2025). Visualizing environmental, social, and governance disclosure in non-financial reports: does it matter for lenders? A machine-supported approach. *VINE Journal of Information and Knowledge Management Systems*. https://doi.org/10.1108/VJIKMS-03-2025-0124

Paluseri, A. H., Kaihatu, T. S., & Christian, T. F. (2025). The Influence of Aggressive Low Carbon Innovation on Firm's ESG Performance at Energy Industry: The Role of Green Knowledge Management, Green Market Orientation, and Management Commitment. *Pakistan Journal of Life & Social Sciences*, *23*(1). https://doi.org/10.57239/PJLSS-2025-23.1.00422

Park, S., & Gupta, S. (2012). Handling endogenous regressors by joint estimation using copulas. *Marketing Science*, *31*(4), 567-586. https://doi.org/10.1287/mksc.1120.0718

Pfeffer, J., & Salancik, G. (2015). External control of organizations—Resource dependence perspective. In *Organizational behavior 2* (pp. 355-370). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9781315702001-24

Rennings, K. (2000). Redefining innovation — eco-innovation research and the contribution from ecological economics. *Ecological Economics*, *32*(2), 319-332. https://doi.org/10.1016/S0921-8009(99)00112-3

Robina-Ramírez, R., Osb Roets, A., Marino-Romero, J. A., & Quirós Alpera, S. (2025). Beyond Profit: Why Hotels Must Embrace Moral Responsibility in Sustainability. *Journal of Quality Assurance in Hospitality & Tourism*, 1-23. https://doi.org/10.1080/1528008X.2025.2563345

Rubio-Andrés, M., Gutiérrez-Broncano, S., Linuesa-Langreo, J., & Sastre-Castillo, M. Á. (2025). Exploring the reality of corporate sustainability strategy and sales performance in entrepreneurial SMEs: the mediating effect of innovation and sustainability performance. *International Entrepreneurship and Management Journal*, *21*(1), 90. https://doi.org/10.1007/s11365-025-01102-8

satpathy, A. s., Sahoo, S. k., Mohanty, A., & Mohanty, P. P. (2025). Strategies for enhancements of MSME resilience and sustainability in the post-COVID-19 era. *Social Sciences & Humanities Open*, *11*, 101223. https://doi.org/10.1016/j.ssaho.2024.101223

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Shulthoni, M., Widodo, H. K., Winarto, W. W. A., & Adinugraha, H. H. (2025). The Impact of Sharia Fintech-Driven Digital Transformation on the Performance and Competitiveness of Batik Enterprises in the Industry 4.0 Era. International Conference on Islamic Economics (ICIE), https://proceeding.uingusdur.ac.id/index.php/icie/article/view/2868

Sinha, K. J., Sinha, S., & Sinha, B. J. (2024). Micro, Small, and Medium-Sized Enterprises (MSMEs): The significant role and challenges in Indonesia's economy. *International Journal For Multidisciplinary Research*, *6*(3), 20824. https://pdfs.semanticscholar.org/ff92/18fe916559b9c0090cd8af8e371700310be2.pdf

Suengkamolpisut, W., Dhar, B. K., Elkhwesky, Z., & Sarkar, S. (2025). Green intellectual capital and sustainable performance: an empirical investigation within the hotel industry. *Journal of Intellectual Capital*, 1-27. https://doi.org/10.1108/JIC-03-2025-0074

Supriadi, I., Maghfiroh, R. U., & Abadi, R. (2025). Islamic financial inclusion and sustainability mindset: Pathways to MSME performance and SDG achievement. *Alkasb: Journal of Islamic Economics*, *4*(1), 51-72. https://doi.org/10.59005/alkasb.v4i1.628

Totok, I. T., Swarmilah, H., Sauh, H. T., Samee, M. H. A., Nik, A. N. A. H., & Fakhrorazi, A. (2025). Why Do Consumers Abandon the E-Carts? *Journal of Theoretical and Applied Electronic Commerce Research*, *20*(2), 57. https://doi.org/10.3390/jtaer20020057

Trevlopoulos, N. S., Tsalis, T. A., Evangelinos, K. I., Tsagarakis, K. P., Vatalis, K. I., & Nikolaou, I. E. (2021). The influence of environmental regulations on business innovation, intellectual capital, environmental and economic performance. *Environment Systems and Decisions*, *41*(1), 163-178. https://doi.org/10.1007/s10669-021-09802-6

Wang, H., Khan, M. A. S., Anwar, F., Shahzad, F., Adu, D., & Murad, M. (2021). Green innovation practices and its impacts on environmental and organizational performance. *Frontiers in psychology*, *11*, 553625. https://doi.org/10.3389/fpsyg.2020.553625

Widjajanti, K., Jumbri, I. A., Hamid, M. S. R. A., Lestari, R. I., Rini, G. P., & Bakri, M. H. (2025). A Conceptual Framework for Green Entrepreneurial Orientation and Sustainable Business Performance in Emerging Asian Markets. *PaperASIA*, *41*(2b), 191-210. https://doi.org/10.59953/paperasia.v41i2b.418

Yadav, S., Choi, T.-M., Kumar, A., Luthra, S., & Naz, F. (2023). A meta-analysis of sustainable supply chain practices and performance: the moderating roles of type of economy and innovation. *International Journal of Operations & Production Management*, *43*(5), 802-845. https://doi.org/10.1108/IJOPM-05-2022-0328

Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). https://www.scirp.org/reference/ReferencesPapers?ReferenceID=1440506