“Enabling routines for green innovation: Strategic management processes, entrepreneurial motivation, creativity, and work performance in Indonesian SMEs”

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ENABLING ROUTINES FOR GREEN INNOVATION: STRATEGIC MANAGEMENT PROCESSES, ENTREPRENEURIAL MOTIVATION, CREATIVITY, AND WORK PERFORMANCE IN INDONESIAN SMEs

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Abstract

This study investigates how entrepreneurial motivation and the strategic management process, conceptualized as enabling routines, shape organizational creativity and green innovation, and how green innovation relates to employee performance in resource-constrained Indonesian SMEs. In 2025, an online survey targeted SME owners and managers with decision authority for strategy, innovation, or human resources across nine Indonesian cities. Invitations were sent to 1,300 SMEs, 412 responses were received (31.7%), and 377 usable cases remained after screening. PLS-SEM (5,000 bootstrap resamples) indicates that strategic management process predicts organizational creativity ($\beta = 0.682$, $p < 0.001$), which predicts green innovation ($\beta = 0.288$, $p < 0.001$) and, in turn, employee performance ($\beta = 0.574$, $p < 0.001$). Entrepreneurial motivation negatively predicts organizational creativity ($\beta = -0.084$, $p = 0.003$). Mediation tests confirm a positive serial indirect effect from strategic management process to employee performance via creativity and green innovation ($\beta = 0.113$, $p = 0.001$) and a negative serial indirect effect for entrepreneurial motivation via the same pathway ($\beta = -0.014$, $p = 0.007$). The model integrates dynamic capabilities and self-determination perspectives by positioning organizational creativity as the microfoundational mechanism. The results imply that disciplined strategic routines provide an enabling infrastructure for creativity-based green implementation, whereas pressure-oriented motivation can undermine the creative engagement required for sustainability change. The evidence is limited by cross-sectional, self-reported data from one country, and future research should employ longitudinal and multi-source designs.

Keywords SMEs, eco-innovation, creativity, motivation, performance

JEL Classification O32, Q55, L26, M10

INTRODUCTION

Small and medium-sized enterprises (SMEs) are central to employment and innovation in emerging markets, yet they face escalating expectations to implement green innovation, defined as the integration of environmentally responsible practices into products, processes, and strategy (Singh et al., 2021; Song & Yu, 2018). In many contexts, however, SMEs operate under binding constraints, including limited capital, capability gaps, and uneven institutional support, which complicate the translation of sustainability pressures into implementable innovation practices (Barforoush et al., 2021; Baquero, 2024). Green

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innovation in SMEs is therefore not only a sustainability concern but also an execution challenge shaped by how firms mobilize scarce resources and coordinate day-to-day change.

Although many Indonesian SMEs face broadly similar sustainability pressures, green innovation outcomes remain uneven, implying that differences in internal routines and motivational conditions may shape whether firms convert constraints into creativity-driven green implementation and performance benefits. Existing evidence remains insufficient to clarify how enabling strategic routines and entrepreneurial motivation jointly influence employee creativity as a mechanism for green innovation under resource scarcity and institutional complexity (Eide et al., 2020; Adomako & Nguyen, 2023). This leaves the pathway linking internal routines and motivational conditions to green innovation and subsequent performance outcomes theoretically and empirically under-specified.

1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

SMEs in emerging markets face intensifying sustainability pressures (Fülöp & Cifuentes-Faura, 2025; Hermansyah et al., 2025; Tu et al., 2025), yet their green innovation trajectories remain uneven because resource constraints, institutional complexity, and capability gaps limit the translation of intentions into credible product and process changes (Zheng et al., 2022; Le, 2022; Sulaiman, 2025). Recent evidence increasingly treats green innovation as capability-contingent rather than automatic: firms require green dynamic capabilities to sense, seize, and transform sustainability opportunities, often by combining internal routines with externally sourced knowledge and alliances to overcome scarcity (Abdelfattah et al., 2025; Guo, 2023; Haug et al., 2025; Saeedikiya et al., 2024). This framing is consistent with a dynamic capabilities logic that emphasizes routinized managerial processes, disciplined resource orchestration, and strategic alignment as mechanisms that enable experimentation and knowledge recombination even under constraints (Teece, 2007; Teece et al., 1997; Le & Mohiuddin, 2024).

In operational terms, disciplined routines also include analytical planning practices that help SMEs reduce waste and stabilize short-horizon decisions under demand volatility; comparative evidence from Indonesian MSMEs shows that alternative forecasting routines can yield measurably different accuracy and operational signals, reinforcing the value of process discipline in resource allocation and day-to-day execution (Suryaningsih et al., 2025).

Within SMEs, these strategic management processes are most plausibly linked to sustainability outcomes through microfoundations that shape idea generation and implementation, because green innovation typically requires not only technical adjustments but also ongoing behavioral change in day-to-day work (Rubio-Andrés et al., 2022; Habib et al., 2021; Alqatan et al., 2025; Hermansyah et al., 2025). Organizational creativity, therefore, functions as a proximal mechanism that converts strategic routines into actionable solutions, and recent SME evidence indicates that creativity and strategic renewal are associated with stronger performance outcomes in constrained settings (Mehta et al., 2025; Wang et al., 2025).

In the sustainability domain, this creativity-to-implementation path becomes especially salient because green innovation is often incremental, cross-functional, and process-intensive. Accordingly, green dynamic capability and related strategic orientations are repeatedly shown to channel upstream managerial conditions into downstream green process innovation, suggesting that the creativity stage is a critical "engine room" of green innovation (Agyapong et al., 2024; Guo, 2023; Haug et al., 2025; Aslam et al., 2025; Le et al., 2022; Zhang et al., 2024; Sarfraz et al., 2022). Complementarily, evidence on sustainability-oriented managerial systems in Indonesia indicates that green financial management is examined as part of the capability set linked to sustainable competitive advantage, with institutional conditions (such as government policy) shaping how sustainability-aligned routines translate into resilience and advantage (Nohong et al., 2024; Le, 2022; Faraz et al., 2025; Damnjanovic et al., 2025).

A scientific tension persists, however, regarding whether entrepreneurial motivation reliably strengthens creativity in SMEs, or whether it can become counterproductive under necessity-driven constraints (Alkhalaf & Al-Tabbaa, 2023; Nguyen et al., 2021). Self-determination theory argues that motivation quality matters: controlled regulation and contingent pressure may crowd out intrinsic engagement when autonomy and psychological safety are weak, thereby inhibiting creative effort and risk-taking even when leaders report strong drive and urgency (Deci et al., 2017). Contemporary evidence supports the relevance of these motivational conditions for creative performance by showing that autonomy-supportive organizational environments foster creativity through need satisfaction and autonomous motivation (Ye et al., 2025), while psychological safety and related psychological resources facilitate employee creative performance by lowering interpersonal risk and enabling experimentation (Nasir et al., 2022). This implies that "entrepreneurial motivation" is not uniformly beneficial in SMEs: when it is enacted primarily as externalized pressure under low autonomy, it may narrow attention toward short-term execution and suppress the exploratory behaviors required for green innovation (Muangmee et al., 2021; Zhang et al., 2024).

Conversely, where strategic management processes institutionalize participative planning, cross-functional decision-making, and protected experimentation time, they can create enabling conditions that support creative search and increase the likelihood that creative ideas are implemented as green product and process improvements (Asad et al., 2023; Iqbal et al., 2021; Hoang et al., 2022). The remaining literature is still fragmented in that green innovation research frequently concentrates on capability and performance linkages at the firm level, whereas motivation–creativity research is often developed outside the green innovation mechanism and rarely connected to employee-level performance implications in an integrated chain (Muñoz-Pascual et al., 2021; Tuan, 2022).

Recent studies on green innovation increasingly highlight performance consequences (including sustainability and competitiveness outcomes), but the employee-level pathway remains underspecified, even though green innovation commonly requires changes in work routines that should be reflected in day-to-day performance and discretionary effort (Schrank & Kijkasiwat, 2024; Harasis et al., 2024; Majali et al., 2022; Achmad & Wiratmadja, 2025; Yadegaridehkordi et al., 2022).

Employee performance is conceptualized as the self-rated in-role work performance of the SME owner/manager respondent.

This study aims to investigate how entrepreneurial motivation and the strategic management process, conceptualized as enabling routines, shape organizational creativity and green innovation, and how green innovation relates to employee performance in resource-constrained Indonesian SMEs. Based on the theoretical arguments developed above, this study proposes an integrated research model illustrating the relationships among the study variables, as presented in Figure 1. In this framing, strategic management processes represent routinized managerial activities that enable resource coordination and learning, while organizational creativity captures the generative capacity through which firms convert routines and motivation into green innovation.

The hypotheses are as follows:

H1: Entrepreneurial motivation is negatively associated with organizational creativity.

H2: The strategic management process is positively associated with organizational creativity.

H3: Organizational creativity is positively associated with green innovation.

H3a: Entrepreneurial motivation exhibits a negative indirect effect on green innovation via organizational creativity.

H3b: The strategic management process has a positive indirect effect on green innovation through organizational creativity.

H4: Green innovation is positively associated with employee performance.

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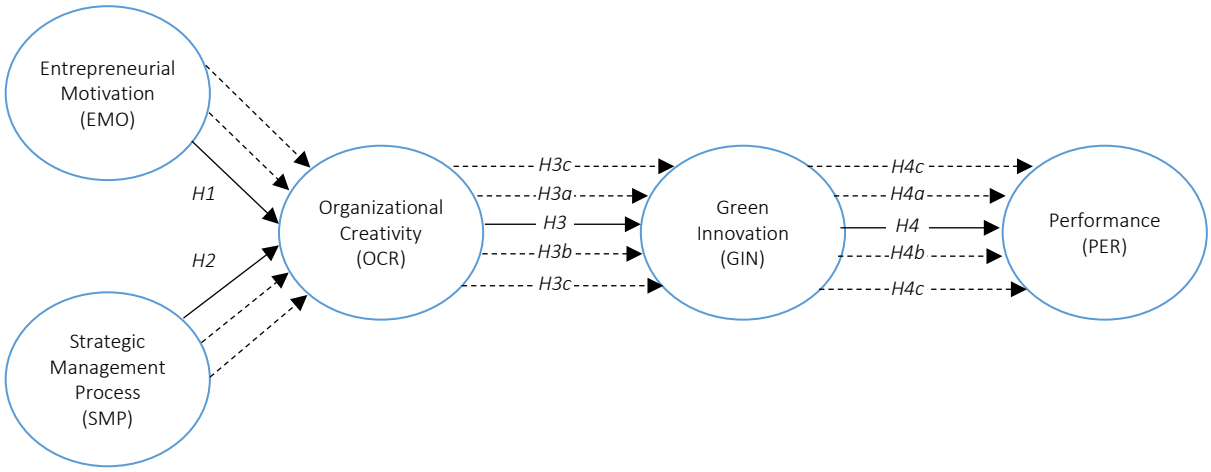

Figure 1. Conceptual framework

H4a: Organizational creativity exhibits a positive indirect effect on employee performance via green innovation.

H4b: Entrepreneurial motivation has a negative serial indirect effect on employee performance via organizational creativity and green innovation.

H4c: The strategic management process exhibits a positive serial indirect effect on employee performance through organizational creativity and green innovation.

2. METHODOLOGY

This study adopted a quantitative, cross-sectional survey to examine the interrelationships among entrepreneurial motivation (EMO), strategic management process (SMP), organizational creativity (OCR), green innovation (GIN), and employee performance (PER) in Indonesian SMEs (Figure 1). A cross-sectional design is appropriate for explanatory and predictive aims in dispersed SME populations where the objective is to model associations rather than to establish causality (Hair & Alamer, 2022). To reduce hindsight bias and analytic flexibility, the paper followed a pre-specified sequence of procedures. The procedures comprised selection and adaptation of validated measurement items, expert review and translation and back-translation to secure language and conceptual equivalence, and pilot testing and refinement. Moreover, it included stratified random sampling and survey administration with eligibility screening, pre-defined quality screening and data-integrity checks, procedural and statistical safeguards to mitigate common method bias, and variance-based model estimation with complete reporting of all hypothesized paths irrespective of statistical significance. Because the survey targeted SME owners and managers, all individual-level measures, including employee performance, were captured as self-reports referring to the respondent's own work behavior. A priori decision rules were set for measurement screening and model evaluation. Analyses were conducted under pre-specified rules to minimize researcher degrees of freedom and to support transparent reporting.

The questionnaire was constructed by adapting measures from established scales to preserve theoretical coherence and content-domain coverage. Entrepreneurial motivation captured intrinsic and extrinsic drivers of entrepreneurial action (Iqbal et al., 2021; Razzaque et al., 2024). Strategic management process reflected planning, participative decision-making, resource allocation, and strategic adaptability consistent with SME strategy research (Frare & Beuren, 2022; Iqbal et al., 2021). Organizational creativity assessed idea generation and organizational conditions for creativity, including organizational support, autonomy, cultural values, and formal recognition (Adomako & Nguyen, 2023; Song & Yu, 2018). To enhance conceptual precision, green innovation was operationalized to reflect green product and green process innovation (Baquero, 2024; Frare & Beuren, 2022). In the main specification, green innova-

tion was modelled as a unidimensional reflective construct. A reflective second-order specification separating green product and green process was estimated as a robustness check. Employee performance captured efficiency, timeliness, quality, adaptability, and initiative at the employee level (Pradhan & Jena, 2017).

All items used a five-point Likert scale ranging from "strongly disagree" to "strongly agree". The response format was selected to balance respondent burden with measurement sensitivity in SME settings (Hair et al., 2020). Instruments underwent expert review, translation, back-translation, and a pilot with SME managers to secure clarity and conceptual equivalence (Hair et al., 2020). Prior to the main survey, a pilot with 30 SME owner-managers was conducted to refine translation and ensure conceptual equivalence. Indicator screening followed standard thresholds. Target loadings were set at or above 0.70, while loadings between 0.40 and 0.69 were considered only if theoretically justified. Average variance extracted was set at or above 0.50, Cronbach's alpha at or above 0.70, and composite reliability between 0.70 and 0.95 (Hair et al., 2020). Items flagged for low loading or problematic cross-loading were considered for removal to improve convergent and discriminant validity while preserving content validity. In this process, strategic management process initially comprised five indicators (SMP1 to SMP5). Following the pre-specified screening rules, one item (SMP5) was removed due to a lower outer loading (λ approximately 0.61) and marginal cross-loading. The retained four items met recommended thresholds (Hair et al., 2020). The complete wording of constructs and items is provided in Appendix A (Table A1).

Primary data were collected through a stratified random sampling procedure across nine Indonesian cities to increase demographic and geographic representativeness. Within each city stratum, contact order was randomized, and invitations were sent to 1,300 SMEs. A total of 412 questionnaires were returned, yielding a response rate of 31.7%, and 377 cases were retained after eligibility and quality screening. Eligible respondents were owners or managers who met the national SME definition and were active decision-makers. Eligibility required ownership or managerial decision rights over strategy, innovation, or human resources. Screening used gating questions on decision authority, with exclusions applied where criteria were not met. The achieved sample satisfies power requirements for small to medium effects and exceeds common adequacy rules in variance-based SEM, supporting stable estimation (Hair et al., 2020).

Ethical approval was obtained from the relevant institutional committee, and all participants provided informed consent. Participation was voluntary and could be discontinued at any point without consequence. To ensure anonymity and impartiality, the survey did not solicit personally identifying information, and responses were analyzed only in aggregate form. We had no supervisory relationship with participants, and no penalties were associated with refusal or withdrawal. Confidentiality was emphasized, and data were stored securely with access restricted to the research team. A descriptive overview of the retained samples is reported in Table 1.

Table 1. Respondent's profile

Characteristics	Frequency	Percentage
Gender		
Male	205	54.38%
Female	172	45.62%
TOTAL	377	100.00%
Region (City)		
Bandung	55	14.59%
Denpasar	22	5.84%
Jakarta	60	15.92%
Makassar	30	7.96%
Malang	25	6.63%
Medan	35	9.28%
Solo	45	11.94%
Surabaya	50	13.26%
Yogyakarta	55	14.59%
TOTAL	377	100.00%
Education		
Below undergraduate	98	25.99%
Undergraduate	170	45.09%
Postgraduate	109	28.91%
TOTAL	377	100.00%
Age		
< 25	50	13.26%
26–30	80	21.22%
31–35	100	26.53%
36–40	90	23.87%
> 41	57	15.12%
TOTAL	377	100.00%

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Table 1 (cont.). Respondent's profile

Characteristics	Frequency	Percentage
Occupation		
Owner / Founder	215	57.03%
CEO / Director	100	26.53%
General Manager / Top Manager	62	16.44%
TOTAL	377	100.00%
Income		
Less than 10 million	120	31.83%
10–50 million	100	26.53%
51–75 million	55	14.59%
76–100 million	57	15.12%
More than 100 million	45	11.94%
TOTAL	377	100.00%

Procedural and statistical safeguards were implemented to address common method bias. Podsakoff et al. (2012) recommend emphasizing confidentiality, neutral item wording, separation of predictors and outcomes, and randomization of item order, and these remedies were applied. Harman's single-factor test was conducted, and a marker-variable approach was implemented following Jakobsen and Jensen (2015). Full-collinearity variance inflation factors were also examined as recommended by Kock et al. (2021). The combined diagnostics indicated that common method bias was unlikely to materially affect substantive inferences. Data integrity checks followed pre-specified rules, including MCAR diagnostics and mean imputation for item-level missingness below five per cent, with listwise exclusion otherwise. Outliers were screened using standardized scores, leverage, and Mahalanobis distance, and a wave-analysis non-response test was conducted (Hair et al., 2020).

Model estimation used PLS-SEM in SmartPLS 3. PLS-SEM was selected on methodological grounds, including prediction orientation, robustness under non-normal indicators, suitability for complex models with moderate samples, and the availability of PLSc for reflective constructs as a consistency check (Chin, 1998; Hair & Alamer, 2022; Hair et al., 2020). The measurement model was evaluated using established criteria, including convergent validity, internal consistency, and discriminant validity (Hair et al., 2020). Discriminant validity assessment followed Henseler et al. (2015) through the HTMT criterion with bootstrap confidence intervals that do not include 1.00. The structural model employed 5,000 bootstrap resamples for path coefficients with two-tailed tests and 95% confidence intervals. Model quality reporting included R^2 and adjusted R^2, Q^2 from blindfolding, SRMR, d_ULS, d_G, inner VIF, and f^2 effect sizes. Out-of-sample prediction was assessed using PLSpredict against linear benchmarks (Chin et al., 2020; Hair & Alamer, 2022; Monecke & Leisch, 2012). Mediation was assessed by estimating indirect effects alongside corresponding direct effects to distinguish partial and full mediation (Hair et al., 2020).

3. RESULTS

We first assessed the reflective measurement model to ensure that subsequent structural inferences rest on reliable and valid constructs. Most outer loadings exceed conventional thresholds, and all average variance extracted values are above the minimum criterion, which supports convergent validity and internal consistency in line with guidance for variance-based SEM and PLS applications (Hair et al., 2020; Monecke & Leisch, 2012). Composite reliability remains below the redundancy threshold, and Cronbach's alpha meets recommended cut-offs, while the removal of SMP5 improves convergent validity without compromising internal consistency. Descriptive statistics indicate sufficient dispersion for theory-driven testing in resource-constrained settings.

Turning to discriminant validity, the square roots of AVE on the diagonal exceed inter-construct correlations, and all HTMT ratios fall below the conservative 0.85 benchmark with bootstrap confidence intervals that do not include one. These results mitigate concerns about construct redundancy and accord with contemporary recommendations for discriminant validity assessment (Hair & Alamer, 2022; Henseler et al., 2015).

Structural relations were estimated using bootstrapped PLS-SEM. Table 4 reports the path coefficients and hypothesis testing outcomes. Entrepreneurial motivation is negatively associated with organizational creativity ($\beta = -0.084$, $t = 2.999$, $p = 0.003$). Strategic management process is positively associated with organizational creativi-

Table 2. Descriptive statistics and quality criteria

Construct	Item	Mean	St. Dev.	Outer Loading	Cronbach's Alpha	Composite Reliability	AVE
Entrepreneurial Motivation (EMO)	EMO1	4.272	0.784	0.878	0.812	0.884	0.718
	EMO2	4.160	0.855	0.816			
	EMO3	4.117	0.861	0.848			
Strategic Management Process (SMP)	SMP1	4.359	0.823	0.834	0.848	0.897	0.686
	SMP2	4.273	0.862	0.844			
	SMP3	4.233	0.915	0.825			
	SMP4	4.252	0.897	0.809			
Organizational Creativity (OCR)	OCR1	4.416	0.754	0.841	0.783	0.873	0.696
	OCR2	4.402	0.783	0.811			
	OCR3	4.392	0.784	0.850			
Green Innovation (GIN)	GIN1	4.238	0.902	0.846	0.848	0.897	0.686
	GIN2	4.155	0.936	0.840			
	GIN3	4.117	0.945	0.811			
	GIN4	4.136	0.951	0.817			
Performance (PER)	PER1	4.272	0.876	0.796	0.868	0.904	0.654
	PER2	4.184	0.924	0.815			
	PER3	4.146	0.939	0.823			
	PER4	4.194	0.917	0.805			
	PER5	4.204	0.917	0.802			

Note: SMP's retained items are SMP1–SMP4; SMP5 was removed during screening due to a lower outer loading and marginal cross-loading; see Appendix A for details.

Table 3. Discriminant validity assessment

Construct	PER	GIN	EMO	OCR	SMP
PER	0.809				
GIN	0.653 (0.725)	0.828			
EMO	0.484 (0.669)	0.520 (0.720)	0.847		
OCR	0.654 (0.734)	0.558 (0.761)	0.598 (0.673)	0.834	
SMP	0.459 (0.685)	0.435 (0.763)	0.739 (0.847)	0.464 (0.725)	0.828

Note: Diagonal entries are the square roots of AVE. Values in parentheses are HTMT ratios. PER = employee performance; GIN = green innovation; EMO = entrepreneurial motivation; OCR = organizational creativity; SMP = strategic management process.

ty ($\beta = 0.682$, $t = 12.247$, $p < 0.001$). Organizational creativity is positively associated with green innovation ($\beta = 0.288$, $t = 4.459$, $p < 0.001$). Green innovation is positively associated with employee performance ($\beta = 0.574$, $t = 14.322$, $p < 0.001$). Based on these estimates, H1 to H4 are supported in the hypothesized directions.

Indirect effects were examined to assess mediation. Table 5 reports the indirect paths and mediation types. The indirect effect of entrepreneurial motivation on green innovation via organizational creativity is negative and statistically significant (indirect effect = −0.024, $t = 2.882$, $p = 0.004$). The indirect effect of strategic management process on green innovation via organizational creativity is positive and statistically significant (indirect effect = 0.197, $t = 3.606$, $p < 0.001$). The indirect effect of organizational creativity on employee performance via green innovation is positive and statistically significant (indirect effect = 0.165, $t = 4.077$, $p < 0.001$). The serial indirect effect of entrepreneurial motivation on employee performance via organizational creativity and green innovation is negative and statistically significant (indirect effect = −0.014, $t = 2.709$, $p = 0.007$). The serial indirect effect of strategic management process on employee performance via organizational creativity and green innovation is positive and statistically significant (indirect effect = 0.113, $t = 3.356$, $p = 0.001$). Based on these estimates, H3a to H4c are supported.

Robustness and supplementary analyses are summarized in Table 6. Diagnostics for common method bias include the unrotated single-factor

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Table 4. Path coefficient and hypotheses testing results

Path	Original Sample (O)	Std. Dev. (STDEV)	*t*-stat.	*p*-values	Decision
EMO → OCR	–0.084	0.028	2.999	0.003**	*H1* accepted in the hypothesized negative direction
SMP → OCR	0.682	0.056	12.247	0.000***	*H2* is accepted
OCR → GIN	0.288	0.065	4.459	0.000***	*H3* is accepted
GIN → PER	0.574	0.040	14.322	0.000***	*H4* is accepted

Note: Two-tailed tests; significance commonly assessed at t ≥ 1.96. *** p < 0.001; ** p < 0.01. PER = employee performance; GIN = green innovation; EMO = entrepreneurial motivation; OCR = organizational creativity; SMP = strategic management process.

Table 5. Mediation effect results

Hypothesis Code	Mediation Path	Indirect Effect	T-Stat	p-Value	Mediation Type	Result
H3a	EMO → OCR → GIN	–0.024	2.882	0.004	Full Negative Mediation	Supported
H3b	SMP → OCR → GIN	0.197	3.606	0.000	Partial Positive Mediation	Supported
H4a	OCR → GIN → PER	0.165	4.077	0.000	Partial Positive Mediation	Supported
H4b	EMO → OCR → GIN → PER	–0.014	2.709	0.007	Full Negative Serial Mediation	Supported
H4c	SMP → OCR → GIN → PER	0.113	3.356	0.001	Partial Positive Serial Mediation	Supported

Note: PER = employee performance; GIN = green innovation; EMO = entrepreneurial motivation; OCR = organizational creativity; SMP = strategic management process.

test, full-collinearity VIFs, and a marker-variable specification. Additional checks include sensitivity to influential observations, measurement invariance testing, and multi-group analysis by gender, unobserved heterogeneity assessment, an alternative estimator for reflective constructs, non-linearity testing, sensitivity to controls, an endogeneity screen, and out-of-sample predictive assessment. The supplementary analyses support the stability of the estimated relationships and the consistency of substantive conclusions across specifications (Jakobsen & Jensen, 2015; Kock et al., 2021; Podsakoff et al., 2012).

Table 6. Robustness and supplementary analyses

Check	Specification / Statistic	Result (value)	Conclusion
Excluding high-leverage cases	Identify outliers via Mahalanobis ($p < .001$) and Cook's D > 4/n; re-estimate without flagged cases (≈14 removed; 3.7%)	EMO→OCR β = –0.082, p = .004; SMP→OCR β = 0.676, p < .001; OCR→GIN β = 0.281, p < .001; GIN→PER β = 0.566, p < .001;	Results remain stable; substantive inference unchanged
Common method variance — Harman one-factor	Unrotated single-factor variance	34% (< 50%)	No dominant single factor; CMV unlikely
Common method bias — Full-collinearity VIFs	Full-collinearity VIFs for EMO, SMP, OCR, GIN, PER	1.74–2.21 (< 3.3)	Low risk of CMV/ endogeneity inflation
Common method bias — Marker variable	Include a three-item unrelated marker construct; regress Marker → PER and partial-out	Marker→PER β = 0.04, p = .38; path changes	Marker path non-significant; substantive paths unaffected
Multi-Group Analysis (gender) with MICOM	MICOM three-step invariance (5,000 permutations); Henseler MGA for path differences	Configural and compositional invariance hold; all path-difference p ≥ .12; Male n = 205; Female n = 172	No structural heterogeneity by gender
Unobserved heterogeneity	FIMIX-PLS for k = 1–4; compare AIC3/BIC/ CAIC; inspect entropy	Best fit k = 1 by CAIC; entropy < .50 for k > 1	No evidence that latent segments alter conclusions
Alternative estimator (PLSc)	Re-estimate with PLSc for reflective constructs	Key path signs unchanged;	Findings consistent under PLSc
Non-linearity check	Add quadratic terms EMO^2 and SMP^2 in the OCR equation	EMO^2 β = –0.021, p = .18; SMP^2 β = 0.017, p = .24	No material non-linear misspecification detected

Table 6 (cont.). Robustness and supplementary analyses

Check	Specification / Statistic	Result (value)	Conclusion
Sensitivity to controls	Controls: respondent age, education, income band, regional fixed effects; drop all controls	Max	Conclusions robust to alternative control specifications
Endogeneity screen (Gaussian copula)	Add Gaussian copula terms for EMO and SMP in the OCR equation	Copula(EMO) p = .27; Copula(SMP) p = .33	No evidence of endogeneity bias in key paths
Out-of-sample prediction (PLSpredict)	Ten-fold cross-validation; compare RMSE/MAE of PER indicators to LM benchmark; report Q^2_pred	PLS RMSE ≤ LM for 4/5 PER indicators; all Q^2_pred > ·	Positive predictive relevance with competitive errors versus LM

Note: PER = employee performance; GIN = green innovation; EMO = entrepreneurial motivation; OCR = organizational creativity; SMP = strategic management process.

4. DISCUSSION

This study set out to clarify how entrepreneurial motivation and the strategic management process shape organizational creativity, how creativity translates into green innovation, and how green innovation relates to employee performance in resource-constrained SMEs. Overall, the results support an integrated mechanism in which process discipline is a strong enabling condition for creativity, creativity functions as a proximal pathway to green innovation, and green innovation is associated with higher employee performance. At the same time, entrepreneurial motivation exhibits a statistically significant but negative association with organizational creativity, indicating that motivational energy in constrained SMEs does not necessarily translate into creative engagement in the expected direction.

A central finding is the large positive effect of the strategic management process on organizational creativity. This finding is consistent with broader strategic management evidence showing that structured strategic positioning and relational coordination mechanisms enhance organizational outcomes through intermediate organizational capabilities and performance-related pathways (Ismail et al., 2025). This suggests that routinized managerial practices, such as systematic planning, coordination, and disciplined resource orchestration, provide SMEs with an enabling infrastructure for idea generation and problem solving even under scarcity. This pattern is consistent with the dynamic capabilities view that emphasizes managerial routines as microfoundations through which firms sense, seize, and transform opportunities in turbulent contexts (Teece et al., 1997; Teece, 2007; Le & Mohiuddin, 2024). It also complements adjacent operational evidence that analytical planning routines, including forecasting discipline, help MSMEs stabilize decision-making and allocate resources more effectively, which can indirectly protect cognitive and temporal bandwidth for experimentation (Suryaningsih et al., 2025). Taken together, the evidence indicates that, in emerging-market SMEs, creativity is not merely a cultural artefact but is substantially conditioned by the presence of structured managerial routines that legitimize learning and experimentation.

The negative association between entrepreneurial motivation and organizational creativity provides a more nuanced contribution. While entrepreneurship research often assumes that motivation and drive catalyze creativity, the present result supports the proposition that motivation can become counterproductive when it is experienced as controlled pressure, particularly in necessity-driven environments characterized by low autonomy and fragile psychological safety. This interpretation is consistent with self-determination theory, which argues that controlled regulation can crowd out intrinsic engagement and reduce creativity-relevant risk-taking (Deci et al., 2017). The finding also resonates with evidence that autonomy-supportive conditions and psychological resources, such as psychological safety and psychological capital, support creative performance by reducing interpersonal risk and enabling experimentation (Ye et al., 2025; Nasir et al., 2022). In practical terms, resource scarcity can shift "motivation" into urgency and short-horizon execution, thereby narrowing attention and discouraging

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exploratory behavior needed for green innovation. Importantly, although statistically robust, the magnitude of this negative association is modest, which suggests that entrepreneurial motivation is not uniformly detrimental but rather context-sensitive. This helps reconcile divergent prior findings by implying that the motivational quality and the organizational climate within which motivation is enacted are likely to determine whether motivation amplifies or suppresses creativity (Alkhalaf & Al-Tabbaa, 2023; Nguyen et al., 2021; Muangmee et al., 2021; Zhang et al., 2024).

The positive effect of organizational creativity on green innovation reinforces the view that creativity is a proximal mechanism translating managerial conditions into sustainability-relevant outputs. Green innovation in SMEs is often incremental and process-intensive, requiring continual ideation, recombination of operational knowledge, and cross-functional cooperation. The results align with prior work linking green creativity to green innovation and firm outcomes, including studies showing that creativity mediates or channels upstream conditions into green innovation and performance (Adomako & Nguyen, 2023; Agyapong et al., 2024; Shahbaz et al., 2025; Maulidi, 2025). They are also consistent with the proposition that green innovation strategy is realized through creativity-relevant processes and identity-related mechanisms (Song & Yu, 2018), and with capability arguments that green dynamic capabilities support the conversion of ideas into implementable green process changes (Guo, 2023; Haug et al., 2025; Saeedikiya et al., 2024). The implication is that strengthening creativity in SMEs is not ancillary to greening; it is a direct route through which green innovation is enacted.

The positive association between green innovation and employee performance extends the green innovation literature by clarifying a micro-level outcome that is often under-emphasized relative to firm-level performance metrics. The result is consistent with arguments that green innovation can improve operational clarity, efficiency, and alignment of routines, which can translate into day-to-day performance improvements. It also coheres with emerging empirical work linking green innovation to employee performance within broader organizational system and leadership contexts (Harasis et al., 2024), and with evidence that green-oriented HRM and pro-environmental behavioral systems influence employee outcomes in ways that can support organizational sustainability (Hameed et al., 2020; Luu, 2018; Gazi et al., 2025). At a broader level, the finding complements SME-focused evidence that green innovation is associated with performance and competitiveness outcomes, especially under sustainability readiness and supportive conditions (Schrank & Kijkasiwat, 2024). The present results indicate that the benefits of green innovation are not only realized at the aggregate firm level but are also observable in employee-level performance, which is the behavioral substrate through which green routines are implemented.

The mediation results reinforce the proposed mechanism-based interpretation. Entrepreneurial motivation exhibits a negative indirect association with green innovation through organizational creativity, indicating that motivation shapes green innovation primarily via its effect on creative engagement rather than acting as an unconditional driver of green outcomes. Conversely, the strategic management process shows a strong positive indirect association with green innovation through organizational creativity, highlighting creativity as the principal conduit through which process discipline is translated into sustainability outputs. The serial indirect effects further suggest that creativity and green innovation jointly transmit upstream conditions to downstream employee performance. This integrated pattern addresses a recurring fragmentation in prior research, where green innovation studies often prioritize capability–performance linkages at the firm level, while motivation–creativity studies are developed outside a green innovation mechanism and are seldom connected to employee-level outcomes (Muñoz-Pascual et al., 2021; Tuan, 2022). By evidencing a coherent chain, the study supports calls to specify microfoundations that explain how sustainability is enacted through everyday organizational behavior in SMEs (Rubio-Andrés et al., 2022; Habib et al., 2021; Alqatan et al., 2025).

Robustness and supplementary analyses strengthen confidence in these interpretations. Multiple diagnostics indicate that common method bias is unlikely to account for the substantive relationships, and the results remain stable after excluding influential observations, varying controls, and

applying alternative estimators. The absence of meaningful gender-based structural differences suggests that the mechanism operates similarly across male and female respondents in this sample, while the lack of evidence for unobserved heterogeneity indicates that latent segmentation is unlikely to overturn the conclusions. Finally, the out-of-sample predictive checks provide support for predictive relevance and competitive error performance, which is consistent with guidance that PLS-SEM results should be evaluated not only for explanatory fit but also for predictive adequacy where appropriate (Jakobsen & Jensen, 2015; Kock et al., 2021; Podsakoff et al., 2012; Chin et al., 2020).

Taken together, we suggest three substantive implications for theory. First, this study reinforces dynamic capabilities logic by showing that strategic management processes are not merely administrative, but are materially linked to creativity as a microfoundation for green innovation (Teece et al., 1997; Teece, 2007). Second, it extends self-determination theory into SME sustainability by demonstrating that entrepreneurial motivation can be negatively associated with creativity when motivational conditions are plausibly experienced as controlled pressure in constrained environments (Deci et al., 2017). Third, it clarifies a micro-level pathway from green innovation to employee performance, supporting the view that sustainability is enacted through behavioral implementation and day-to-day performance rather than exclusively through aggregate firm outcomes (Harasis et al., 2024; Schrank & Kijkasiwat, 2024).

CONCLUSION

This study investigates how entrepreneurial motivation and the strategic management process, conceptualized as enabling routines, shape organizational creativity and green innovation, and how green innovation relates to employee performance in resource-constrained Indonesian SMEs. Employee performance is assessed as the self-rated in-role work performance of the SME owner/manager respondent. Using survey data from Indonesian SME decision-makers and PLS-SEM, the results show that strategic management processes support creativity, creativity promotes green innovation, and green innovation is positively associated with work performance, while entrepreneurial motivation shows a small negative association with creativity in resource-constrained conditions. The results indicate that the strategic management process is a substantial enabling condition for organizational creativity and that organizational creativity is positively associated with green innovation. Green innovation, in turn, is positively associated with employee performance. In contrast, entrepreneurial motivation is negatively associated with organizational creativity, suggesting that motivational drive under constraint does not necessarily translate into creative engagement.

These findings support three principal conclusions. First, sustainability-oriented innovation in SMEs appears to depend critically on the presence of disciplined managerial routines that coordinate attention, prioritize scarce resources, and legitimate experimentation. Second, organizational creativity functions as a central conversion point through which upstream managerial conditions become implementable green practices, reinforcing the argument that micro-level mechanisms are pivotal for understanding heterogeneous green innovation trajectories among otherwise comparable SMEs. Third, the benefits of green innovation are observable at the employee level, implying that sustainability gains are realized through day-to-day behavioral enactment and performance rather than being confined to aggregate firm-level outcomes.

This study has limitations that limit inference and inform future research. The evidence is based on a cross-sectional survey design, so the results should be interpreted as associational rather than causal despite extensive robustness diagnostics. The study also relies on self-reported measures, which may be subject to common method bias even when procedural and statistical checks indicate that such bias is unlikely to be dominant. In addition, the focus on Indonesian SMEs enhances contextual relevance but may constrain the generalizability of the findings to other institutional environments and sectors.

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Future research should extend this line of inquiry in several directions. Longitudinal or multi-wave designs would enable stronger tests of temporal ordering and the dynamic adjustment of capabilities, creativity, and innovation over time. Studies that incorporate multi-source data and objective indicators, such as operational measures of green process change and externally verifiable performance metrics, would further strengthen inference. Finally, boundary conditions should be modelled explicitly, particularly autonomy support, psychological safety, and environmental turbulence, to clarify when entrepreneurial motivation becomes enabling rather than inhibiting for creativity and green innovation in SMEs.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Constructs and measurement items

Construct	Definition	Code	Item Statement	Source
Entrepreneurial Motivation (EMO)	The intrinsic and extrinsic drivers that influence individuals to engage in entrepreneurial activity	EMO1	I am motivated to pursue entrepreneurship in order to achieve financial independence.	Iqbal et al. (2021); Razzaque et al. (2024); Al Shammre et al. (2023)
		EMO2	I am inspired to start a business that contributes positively to society.	
		EMO3	My passion for creating and developing something valuable encourages my entrepreneurial journey.	
Strategic Management Process (SMP)	A structured, continuous process to formulate, implement, and evaluate strategies to achieve long-term objectives. (retained: SMP1–SMP4; SMP5 removed during screening)	SMP1	Our organization formulates and communicates strategic plans clearly.	Iqbal et al. (2021); Frare and Beuren (2022)
		SMP2	Management regularly reviews and updates strategic goals and objectives.	
		SMP3	Strategic decisions involve participative discussion across key functions.	
		SMP4	Organizational resources are allocated according to strategic priorities.	
		SMP5	Our organization adapts its strategies proactively in response to changes in the external environment. (removed during screening; $\lambda \approx 0.61$; marginal cross-loading).	
Organizational Creativity (OCR)	The organizational capability to generate, support, and implement novel and useful ideas	OCR1	Employees are encouraged to generate and present creative ideas.	Song and Yu (2018); Adomako and Nguyen (2023)
		OCR2	The organization supports innovative solutions to business challenges.	
		OCR3	Employees are given autonomy to experiment with new approaches.	
		OCR4	Innovation is a fundamental value embedded in our organizational culture.	
		OCR5	Employees receive formal recognition for their creative contributions.	
Green Innovation (GIN)	The extent to which the organization engages in environmentally friendly innovation across products, processes, and services	GIN1	We redesign products to reduce materials, emissions, or waste across the lifecycle.	Baquero (2024); Frare and Beuren (2022); Muangmee et al. (2021)
		GIN2	We substitute hazardous inputs with safer, environmentally friendly alternatives.	
		GIN3	We improve production processes to lower energy or water intensity.	
		GIN4	We recover, reuse, or recycle by-products within operations.	
Performance (PER)	The extent to which employees effectively accomplish tasks and responsibilities according to targets and standards set by the organization, encompassing efficiency, timeliness, quality, adaptability, and initiative	PER1	I consistently complete my assigned tasks and responsibilities on time.	Pradhan and Jena (2017)
		PER2	I meet the performance standards and targets expected by my organization.	
		PER3	I contribute to improving work processes and overall efficiency within my SME.	
		PER4	I adapt quickly to changes, new technologies, or innovative practices in my workplace.	
		PER5	I willingly take the initiative and handle additional or innovative tasks as required.	