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Entrepreneurial Orientation and Sustainable Performance in Indonesian SMEs: Testing a Moderated Mediation Model of Knowledge Management Capability and Environmental Dynamism

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Abstract

This study examines the influence of Entrepreneurial Orientation (EO) on Sustainable Performance (SP) among Indonesian SMEs, incorporating the mediating role of Knowledge Management Capability (KMC) and the moderating role of Environmental Dynamism (ED). Grounded in the Resource-Based View (RBV) and Knowledge-Based View (KBV), the research employs Partial Least Squares Structural Equation Modeling (PLS-SEM) on pilot data from 43 SMEs. The results indicate that EO significantly enhances both KMC and SP, with KMC partially mediating the relationship. However, ED does not significantly moderate the structural relationships. These findings highlight that internal capabilities play a more critical role than external environmental conditions in driving sustainability in SMEs. This study contributes to the literature by integrating EO, KMC, and ED within a moderated mediation framework in an emerging economy context, providing nuanced insights into how entrepreneurial and knowledge-based capabilities interact to support sustainable performance.

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INTRODUCTION

In today's turbulent and competitive environment, sustainable performance has become a survival imperative for firms—not only in developed economies but particularly in emerging markets such as Indonesia and the ASEAN region, where SMEs dominate economic structures. Sustainable performance goes beyond financial outcomes to include environmental and social responsibilities, in line with the Triple Bottom Line (TBL) framework (Elkington, 1997; Hubbard, 2009).

In ASEAN, the ASEAN Taxonomy for Sustainable Finance (2024) has been introduced to standardize sustainable practices and reporting, showing strong policy emphasis on ESG adoption (ASEAN, 2024). In Indonesia, SMEs contribute more than 60% to GDP but face unique challenges in aligning entrepreneurial growth with sustainability expectations (OECD, 2024). Recent studies confirm that Indonesian SMEs are under increasing institutional and regulatory pressure to balance profit with sustainability practices, and entrepreneurial orientation (EO) plays a crucial role in enabling such alignment (Wibowo & Saputra, 2024). EO, characterized by innovativeness, proactiveness, and risk-taking (Lumpkin & Dess, 1996), has been consistently linked to performance (Rauch et al., 2009). Recent evidence, however, shows that EO's impact on sustainable performance varies across contexts, and depends on organizational capabilities and environmental conditions (Chowdhury et al., 2024; Engelen et al., 2014).

One important mechanism is knowledge management capability (KMC), which refers to the firm's ability to create, share, and apply knowledge resources (Darroch, 2005; Gold et al., 2001). Studies in ASEAN and Indonesia confirm that SMEs with strong EO tend to invest more in KM processes, enabling innovation and sustainability outcomes (Abubakar et al., 2019; Heryanto & Wibisono, 2023).

At the same time, the external environment plays a critical role. Environmental dynamism (ED)—the rate and unpredictability of change in markets and technologies—has been shown to moderate the EO–performance link, especially under turbulent contexts (Dess & Beard, 1984; Jansen et al., 2006). In the ASEAN region, where regulatory transitions, technological adoption, and global disruptions are common, ED strongly conditions entrepreneurial success (OECD, 2024).

Building on these arguments, this study examines the direct effects of EO and KMC on sustainable performance, the mediating role of KMC, and the moderating role of ED. By applying RBV, KBV, dynamic capabilities theory, and contingency theory, this research aims to provide a comprehensive understanding of how EO translates into sustainable performance within the ASEAN/Indonesian context (Hair et al., 2019; Teece, 2007).

Hypotheses Development

Sustainable Performance in ASEAN and Indonesia

Sustainable performance is increasingly framed as the integration of economic, environmental, and social outcomes (Elkington, 1997). In ASEAN, sustainability has been institutionalized via frameworks such as the ASEAN Taxonomy (ASEAN, 2024), while in Indonesia, SMEs are encouraged to align with ESG reporting (PLN, 2023). Recent reviews highlight that SMEs in Southeast Asia face significant barriers, including resource scarcity, yet those adopting sustainability-oriented strategies show stronger resilience (Gimenez et al., 2012; OECD, 2024).

Entrepreneurial Orientation and Sustainable Performance

EO enables firms to recognize opportunities and pursue innovations aligned with sustainability agendas. A recent meta-analysis on green entrepreneurial orientation finds a positive and significant effect on environmental and social outcomes (Chowdhury et al., 2024). Empirical studies in Indonesian SMEs also confirm that EO dimensions significantly predict firm performance (Wibowo & Saputra, 2024). Therefore:

H1: Entrepreneurial orientation has a positive effect on sustainable performance.

Entrepreneurial Orientation and Knowledge Management Capability

The KBV suggests EO stimulates knowledge processes that strengthen KMC (Zahra & George, 2002). In ASEAN SMEs, EO has been found to foster investments in KM infrastructure that improve adaptability and innovation (Abubakar et al., 2019). Similarly, Indonesian SME studies show that EO drives knowledge creation and sharing routines (Heryanto & Wibisono, 2023).

H2: Entrepreneurial orientation has a positive effect on knowledge management capability.

Knowledge Management Capability and Sustainable Performance

KMC allows firms to integrate and exploit knowledge effectively, leading to innovation and sustainable outcomes (Darroch, 2005; Gold et al., 2001). Recent evidence from Malaysian and Indonesian SMEs confirms that KM practices directly enhance sustainability-oriented innovation and performance (Abubakar et al., 2019; Sulaiman et al., 2022).

H3: Knowledge management capability has a positive effect on sustainable performance.

The Mediating Role of KMC

EO's influence on sustainable performance is often mediated through KM processes. For example, Indonesian studies reveal that EO improves performance only when mediated by KM or innovation capabilities (Heryanto & Wibisono, 2023). This supports RBV and KBV arguments that resources require organizational capabilities to generate outcomes.

H4: Knowledge management capability mediates the relationship between entrepreneurial orientation and sustainable performance.

The Moderating Role of Environmental Dynamism

ED shapes the strength of EO and KM effects. Empirical studies in dynamic ASEAN contexts suggest that turbulence amplifies the need for entrepreneurial actions and knowledge processes (Engelen et al., 2014; OECD, 2024). In Indonesia, firms facing regulatory and market shifts derive greater value from EO under dynamic conditions (Wibowo & Saputra, 2024).

H4a: ED positively moderates the EO–sustainable performance relationship.

H4b: ED positively moderates the EO–KMC relationship.

H4c: ED positively moderates the KMC–sustainable performance relationship.

Indirect and Conditional Indirect Effects

Recent studies recommend integrating mediation and moderation in explaining EO outcomes (Chowdhury et al., 2024; Hayes, 2015). Under high ED, the indirect effect of EO on sustainable performance via KMC should be stronger.

H5: EO has an indirect positive effect on sustainable performance through KMC.

H6a: ED moderates the indirect effect at the EO → KMC stage (first-stage moderated mediation).

H6b: ED moderates the indirect effect at the KMC → SP stage (second-stage moderated mediation).

H6c: ED moderates the indirect effect in both stages (dual moderated mediation).

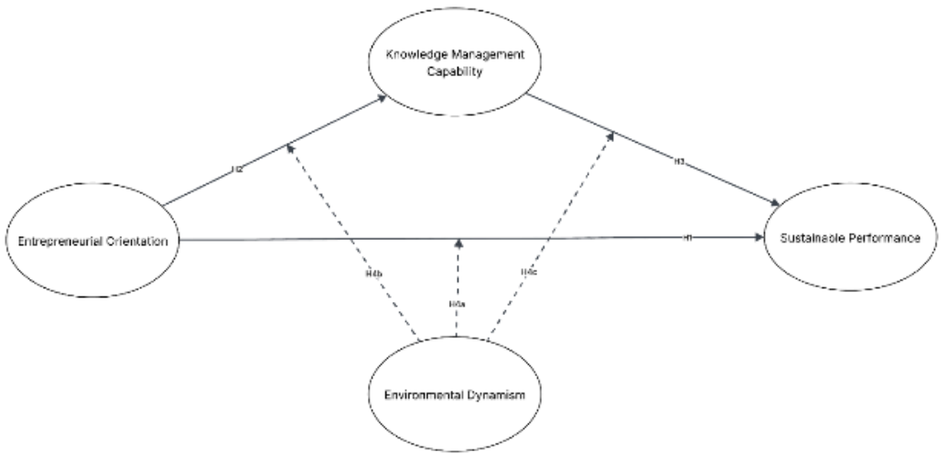

Figure 1. Research Model

METHOD

This study adopts a quantitative, explanatory research design using a survey-based approach. Structural Equation Modelling (SEM) with partial least squares (PLS-SEM) is employed to test the proposed hypotheses, as it is suitable for complex models involving mediation and moderation simultaneously (Hair et al., 2012, 2019).

The population consists of business firms operating in Indonesia, especially SMEs. A purposive sampling method is applied, targeting entrepreneurs, managers, and decision-makers. A minimum sample size of 200 is considered adequate for PLS-SEM (Hair et al., 2019). Given time constraints, this paper presents an initial pilot test involving 43 SME respondents to validate the measurement instruments before full-scale data collection.

Entrepreneurial Orientation (EO) is measured using scales adapted from Lumpkin and Dess (1996) and Covin and Wales (2012), covering innovativeness, proactiveness, and risk-taking. Knowledge Management Capability (KMC) is measured using indicators from Gold et al. (2001), including knowledge acquisition, sharing, and utilization. Sustainable Performance (SP) is measured by economic, social, and environmental dimensions, based on the triple bottom line (1,19). Environmental Dynamism (ED) is measured based on perceived unpredictability and rate of change in markets and technologies (Dess & Beard, 1984; Jansen et al., 2006). All constructs are assessed using multi-item Likert scales, ranging from 1 (strongly disagree) to 5 (strongly agree).

The analysis procedure includes measurement model assessment, which covers validity and reliability tests such as Cronbach's alpha, composite reliability, AVE, and discriminant validity. It also includes structural model assessment, which involves testing direct, mediation, moderation, and moderated mediation effects using bootstrapping (5,000 resamples). In addition, moderation analysis is conducted by estimating interaction terms (EO×ED, KMC×ED) using a two-stage approach (Hair et al., 2019). Finally, moderated mediation analysis is performed by testing conditional indirect effects and reporting the index of moderated mediation (Hayes, 2015).

RESULT AND DISCUSSION

Measurement Model

Reliability and validity were assessed using Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). All constructs met the recommended threshold (CR > 0.7, AVE > 0.5), confirming convergent validity.

Table 1. Measurement Model Results

Constructs	Cronbach's Alpha	CR	AVE	Interpretation
EO	0.886	0.908	0.528	Reliable
KMC	0.822	0.872	0.539	Reliable
SP	0.817	0.867	0.523	Reliable
ED	0.698	0.797	0.511	Acceptable (Pilot)

Structural Model (R^2 and Path Coefficients)

Table 2. Structural Model Results

Endogenous Variable	R^2	Adjusted R^2	Interpretation
KMC	0.534	0.500	Moderate explanatory power
SP	0.464	0.395	Moderate explanatory power

The model explains 53.4% of the variance in KMC and 46.4% of the variance in SP, indicating satisfactory predictive capability for a pilot sample.

Hypotheses Testing (Direct Effects)

Table 3. Direct Effects Testing

Path	β	t-statistics	p-value	Results
EO → KMC	0.568	3.762	0.000	Supported
EO → SP	0.448	2.445	0.015	Supported
KMC → SP	0.374	1.856	0.064	Marginally Supported
ED → KMC	0.294	1.981	0.048	Supported
ED → SP	-0.246	1.667	0.096	Not Supported

Moderation Effects

Table 4. Moderation Effects

Path	β	t-statistics	p-value	Results
ED x EO → KMC	-0.171	1.275	0.203	Not Supported
ED x EO → SP	0.060	0.296	0.767	Not Supported
ED x KMC → SP	0.015	0.079	0.937	Not Supported

Mediation and Moderated Mediation

Table 5. Indirect Paths

Indirect Path	β	t-statistics	p-value	Results
EO → KMC → SP	0.212	1.666	0.096	Partial, Marginal
ED → KMC → SP	0.110	1.340	0.180	Not Supported
(ED x EO) → KMC → SP	-0.064	1.169	0.243	Not Supported

Summary of Finding

Table 6. Summary of Findings

Effect Type	Path	Result	Interpretation
Direct	EO → SP	Significant	EO drives sustainability
Direct	EO → KMC	Significant	EO enhances KM
Direct	KMC → SP	Marginal	KMC supports SP weakly
Indirect	EO → KMC → SP	Marginal mediation	Partial mediation
Moderation	ED × EO / ED × KMC	Not significant	Weak contextual effects
Predictive Power	KMC R^2 = 0.534; SP R^2 = 0.464	Moderate	Model stability (pilot sample)

Discussion

Entrepreneurial Orientation and Knowledge Management Capability

First, the significant effect of EO on KMC confirms that entrepreneurial firms tend to develop stronger knowledge processes. This finding reinforces the Knowledge-Based View (KBV), which argues that firms with higher entrepreneurial posture are more proactive in acquiring, sharing, and utilizing knowledge (Darroch, 2005). In the context of Indonesian SMEs, this suggests that entrepreneurial behavior is not only opportunity-driven but also capability-building.

Entrepreneurial Orientation and Sustainable Performance

Second, EO was found to significantly influence sustainable performance. This supports prior studies and aligns with the Resource-Based View (RBV) and dynamic capabilities perspective, indicating that innovativeness, proactiveness, and risk-taking enable firms to achieve not only financial outcomes but also social and environmental sustainability. In emerging markets such as Indonesia, this finding highlights that EO serves as a strategic mechanism to balance growth and sustainability pressures. The direct effect of EO on SP is significant (β = 0.448, p = 0.015), affirming that innovative and proactive SMEs achieve superior sustainable outcomes. This aligns with RBV and dynamic capabilities theory (Teece, 2007).

Mediation via Knowledge Management Capability

Third, the mediating role of KMC, although only marginally significant, its positive direction and the EO → KMC → SP pathway (β = 0.212, p = 0.096) suggests that knowledge processes act as a partial transmission mechanism through which EO influences performance. This implies that EO alone may not be sufficient; rather, its effectiveness depends on the firm's ability to transform entrepreneurial initiatives into structured knowledge practices. This finding is consistent with prior research emphasizing the importance of organizational capabilities in converting strategic orientation into tangible outcomes.

The Role of Environmental Dynamism

Fourth, environmental dynamism shows a significant direct effect on KMC but fails to moderate structural relationships. This result deviates from several prior studies that found a strengthening effect of environmental turbulence. A possible explanation is that SMEs in this study operate under resource constraints, leading them to prioritize internal capability development rather than adapting strategically to environmental uncertainty. In such contexts, environmental changes may trigger learning (KMC) but do not necessarily enhance performance outcomes.

Moderated Mediation Interpretation

Finally, the insignificant moderated mediation effect suggests that environmental dynamism does not significantly alter the indirect relationship between EO and SP via KMC. This indicates that the internal capability pathway remains stable regardless of environmental conditions, at least in the pilot sample. This finding contributes to the contingency perspective by suggesting that in early-stage or resource-constrained SMEs, internal capabilities may dominate over external contingencies.

Theoretical Implications

Overall, this study highlights that sustainable performance in Indonesian SMEs is primarily driven by internal entrepreneurial and knowledge-based capabilities, rather than external environmental conditions. These findings provide important implications for both theory and practice, particularly in emerging economy contexts where firms face structural and resource

limitations. These findings strengthen the integrated view of RBV, KBV, and Contingency Theory, emphasizing that internal capabilities remain critical, even under turbulence. Insignificant moderations can be understood as early-stage evidence that internal dynamic capabilities buffer external uncertainty.

CONCLUSION AND RECOMMENDATION

This study tested a moderated mediation model linking Entrepreneurial Orientation, Knowledge Management Capability, Environmental Dynamism, and Sustainable Performance among Indonesian SMEs. EO was found to directly enhance both KMC and SP, while KMC partially mediates this relationship. ED affects KMC directly but does not significantly moderate the EO–SP or KMC–SP relationships.

The results imply that EO is a fundamental strategic posture for SMEs, whereas KMC serves as an internal conduit that strengthens sustainability. The moderating role of ED, though theoretically sound, requires validation using larger samples. Future studies should increase the sample size (≥200), apply multi-group or longitudinal designs, and test cross-country ASEAN data for generalization.

This study enriches ASEAN SME literature by integrating RBV, KBV, and Contingency Theory within a moderated-mediation framework.

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