

Predicting Organizational Innovation from Entrepreneurial Orientation and Dynamic Capabilities: The Moderating Role of Environmental Dynamism

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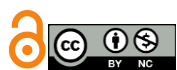
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ABSTRACT

Objective: This study aimed to predict organizational innovation from entrepreneurial orientation and dynamic capabilities and to examine the moderating role of environmental dynamism among small and medium-sized enterprises in Thailand.

Methods and Materials: This quantitative, cross-sectional, correlational study was conducted among 412 managers, owner-managers, executives, and senior organizational decision-makers working in Thai small and medium-sized enterprises. Participants were selected from manufacturing, wholesale and retail, information and communication technology, hospitality, professional services, and other service sectors. Data were collected using standardized measures of entrepreneurial orientation, dynamic capabilities, environmental dynamism, and organizational innovation. Construct reliability and validity were assessed using Cronbach's alpha, composite reliability, average variance extracted, and confirmatory factor analysis. Pearson correlation analysis and hierarchical multiple regression were used to test the direct relationships among the variables. Moderation analysis was performed by entering mean-centered interaction terms for entrepreneurial orientation $\times$ environmental dynamism and dynamic capabilities $\times$ environmental dynamism. Statistical significance was set at $p < .05$.

Findings: Entrepreneurial orientation significantly predicted organizational innovation ($B = 0.36$, $SE = 0.04$, $\beta = .35$, $t = 8.47$, $p < .001$), while dynamic capabilities showed the strongest direct effect ($B = 0.48$, $SE = 0.05$, $\beta = .44$, $t = 10.19$, $p < .001$). Environmental dynamism also had a significant positive effect on organizational innovation ($B = 0.12$, $SE = 0.04$, $\beta = .12$, $t = 3.12$, $p = .002$). The main-effects model explained 56% of the variance in organizational innovation. Environmental dynamism significantly moderated both the entrepreneurial orientation–innovation relationship ($B = 0.15$, $SE = 0.04$, $\beta = .14$, $t = 3.79$, $p < .001$) and the dynamic capabilities–innovation relationship ($B = 0.19$, $SE = 0.04$, $\beta = .17$, $t = 4.62$, $p < .001$), increasing the final explained variance to 61%.

Conclusion: Organizational innovation in Thai SMEs is strengthened by entrepreneurial orientation and dynamic capabilities, particularly under highly dynamic environmental conditions, indicating that firms benefit most when proactive strategic behavior is combined with strong adaptive and reconfiguration capabilities.

Keywords: Entrepreneurial Orientation, Dynamic Capabilities, Environmental Dynamism, Organizational Innovation, Small and Medium-Sized Enterprises, Thailand

1 Introduction

Innovation has become a central determinant of organizational survival, competitiveness, and long-term growth in contemporary business environments characterized by rapid technological development, changing customer expectations, shortened product life cycles, intensified global competition, and increasing uncertainty. Organizations are no longer able to sustain superior performance solely by exploiting existing resources and routines; instead, they must continuously identify emerging opportunities, experiment with new ideas, recombine knowledge, and adapt their resource bases to changing environmental conditions. This imperative is particularly important for small and medium-sized enterprises (SMEs), which often operate with comparatively limited financial, technological, and managerial resources while simultaneously facing substantial pressure to respond quickly to market developments. Organizational innovation therefore represents not merely the introduction of new products or technologies but a broader organizational capacity to generate, adopt, and implement novel products, services, processes, managerial practices, and strategic approaches. Recent research increasingly emphasizes that innovation outcomes depend on the interaction of entrepreneurial behavior, organizational capabilities, learning processes, and contextual environmental conditions rather than on isolated resources or managerial actions (Fu et al., 2024; Yu et al., 2023; Zheng, 2024).

Entrepreneurial orientation has emerged as one of the most influential strategic constructs for explaining how organizations respond proactively to competitive opportunities and threats. It generally reflects a firm's strategic posture toward innovativeness, proactiveness, and risk-taking and captures the extent to which decision-makers are willing to pursue new opportunities, introduce novel ideas, act ahead of competitors, and commit resources under uncertain conditions. Firms with a strong entrepreneurial orientation tend to challenge established routines and market assumptions, search actively for new opportunities, and place greater emphasis on experimentation and strategic renewal. A systematic examination of the literature has demonstrated a persistent association between entrepreneurial orientation and innovation, although the magnitude and mechanisms of this relationship vary considerably across organizational and environmental contexts (Fu et al., 2024). Entrepreneurial orientation can therefore be understood as a strategic behavioral foundation

that encourages firms to seek and exploit innovation opportunities, but its value depends on whether organizations possess the capabilities required to translate entrepreneurial intentions into operational and market outcomes.

The innovation-related significance of entrepreneurial orientation has been demonstrated across diverse organizational settings. Research on new ventures suggests that entrepreneurial orientation contributes to sustainable innovation capability by encouraging exploratory and exploitative learning processes that enable organizations to identify and implement novel solutions (Yu et al., 2023). Similarly, studies of SMEs have shown that entrepreneurial orientation can improve organizational performance by supporting technology adoption, digitalization, networking, and strategic responsiveness (Maharjan et al., 2024; Milovanović et al., 2023; Nugroho & Heykal, 2023). Entrepreneurial orientation has also been linked to competitive advantage through mechanisms such as market orientation and knowledge sharing, reinforcing the argument that entrepreneurial behavior generates its greatest value when it is integrated with organizational learning and knowledge processes (Tessema et al., 2025). In sustainability-oriented contexts, entrepreneurial orientation has been conceptualized as an important mechanism through which organizations align strategic opportunity seeking with environmental and social objectives, including green human resource management and green supply chain practices (Ahmed et al., 2024). These findings collectively indicate that entrepreneurial orientation can provide an important strategic impetus for innovation, yet entrepreneurial intent alone is unlikely to ensure successful innovation unless firms can mobilize, integrate, and reconfigure their resources effectively.

This limitation draws attention to the concept of dynamic capabilities. Dynamic capability theory extends the traditional resource-based perspective by emphasizing that competitive advantage in changing environments depends not only on the possession of valuable resources but also on the capacity to renew, integrate, and transform those resources in response to environmental change. Dynamic capabilities commonly include activities related to sensing emerging opportunities and threats, seizing promising opportunities through coordinated strategic action, and transforming or reconfiguring organizational resources and routines. In this sense, dynamic capabilities provide the organizational mechanisms through which firms can convert information, knowledge, technologies, and market signals

into adaptive action and innovation. Evidence from start-ups indicates that dynamic capabilities support business sustainability by helping firms respond to changing market conditions and reorganize their resource configurations (Karan et al., 2024). Likewise, research on e-business start-ups has shown that innovation capability and dynamic capability are closely connected to improved organizational performance, highlighting the role of adaptive organizational processes in digitally intensive markets (Dewi et al., 2024).

Dynamic capabilities are particularly relevant to innovation because the innovation process requires continuous adjustment between internal organizational competencies and external market developments. Firms must be capable of recognizing technological opportunities, acquiring external knowledge, combining that knowledge with existing expertise, reallocating resources, and modifying operational routines. Knowledge-based dynamic capabilities have consequently been identified as important mechanisms through which digital business strategies influence innovation performance (Zheng, 2024). Similarly, developments in artificial intelligence demonstrate how new technologies can generate organizational impact when firms are capable of embedding them within broader dynamic capability processes, rather than treating technological acquisition as an isolated investment (Schneider et al., 2026). Such evidence suggests that dynamic capabilities provide the organizational infrastructure required to translate strategic opportunities into innovative outcomes.

Theoretical and empirical work has also increasingly emphasized that entrepreneurial orientation and dynamic capabilities should not be viewed as independent or competing explanations of performance. Entrepreneurial orientation encourages firms to search for opportunities, accept uncertainty, and pursue novel initiatives, whereas dynamic capabilities determine whether firms can effectively reorganize their resources and competencies in support of these entrepreneurial initiatives. Research has suggested that entrepreneurial orientation and knowledge creation can operate synergistically to strengthen dynamic capabilities and ultimately enhance firm performance (Kusumawijaya & Astuti, 2025). A related conceptual framework proposes that entrepreneurial orientation and social capital contribute to the development of dynamic capabilities, suggesting that entrepreneurial strategic posture may serve as an antecedent to organizational adaptation and resource transformation (Octasylyva et al., 2023). In international business, dynamic capabilities have also been

shown to function as an important mediating mechanism connecting international entrepreneurial orientation with international performance (Theodosiou et al., 2024). These studies indicate that entrepreneurial orientation may stimulate the strategic search for new possibilities, whereas dynamic capabilities allow firms to convert those possibilities into organizational action.

The connection between these constructs is also evident in research addressing strategic flexibility and organizational performance. Entrepreneurial orientation, learning orientation, and dynamic capability have been found to jointly influence strategic flexibility and SME performance, suggesting that organizational adaptability depends on the interaction of strategic posture and organizational capability (Kusumastuti, 2023). Corporate entrepreneurial leadership, organizational resources, and capabilities have similarly been associated with sustainable performance, reinforcing the importance of coordinated entrepreneurial and capability-based processes (Chaudhuri et al., 2023). These findings support the proposition that organizational innovation may be best explained by models that simultaneously consider both entrepreneurial orientation and dynamic capabilities, rather than examining either construct in isolation. Entrepreneurial orientation may encourage organizations to pursue innovation, while dynamic capabilities determine whether they can continuously renew and recombine their resources in order to implement such innovation successfully.

Digitalization has further strengthened the relevance of this relationship. The growing use of digital technologies, artificial intelligence, big data analytics, and digitally mediated organizational processes has increased both the opportunities available to firms and the complexity of organizational adaptation. Big data analytics capabilities and artificial intelligence capabilities have been associated with stronger organizational performance, particularly where firms possess complementary organizational and strategic capabilities that allow data-driven insights to be converted into action (Naz et al., 2023). Similarly, big data analytics capability can influence sustainable supply chain performance through entrepreneurial dimensions such as innovativeness, proactiveness, and risk-taking (Tipu & Fantazy, 2023). In social enterprises, digital capabilities have also been linked to social innovation performance through firm-level entrepreneurial orientation, demonstrating that entrepreneurial strategic posture can provide an important pathway through which technology-related capabilities generate innovation outcomes (Satar et

al., 2024). Digital transformation may likewise function as an organizational mechanism through which dimensions of entrepreneurial orientation strengthen resilience, particularly in sectors exposed to environmental disruptions and market uncertainty (Lissaneddine, 2026). Taken together, these studies demonstrate that innovation increasingly results from interactions among entrepreneurial intent, technological possibilities, dynamic organizational capabilities, and environmental pressures.

Although entrepreneurial orientation and dynamic capabilities are generally expected to enhance innovation, their effects are unlikely to remain constant across different environmental conditions. Environmental dynamism refers to the rate, unpredictability, and intensity of change occurring in a firm's external environment, including changes in customer preferences, technologies, competitive behavior, regulations, supply conditions, and market structures. In highly dynamic environments, information becomes obsolete more rapidly, existing routines lose relevance, and firms face greater difficulty predicting the consequences of strategic decisions. These conditions can create threats, but they can also provide significant entrepreneurial opportunities for firms capable of recognizing and exploiting emerging changes. Entrepreneurial alertness has been shown to become particularly important in dynamic environments because it enables organizations to identify opportunities and translate them into entrepreneurial orientation and improved performance (Istipliler et al., 2025). Environmental uncertainty may therefore increase the strategic value of entrepreneurial behavior by making proactive opportunity seeking and experimentation more important.

The same reasoning applies to dynamic capabilities. In stable environments, organizations may continue to perform effectively through existing routines and resource configurations, reducing the immediate need for continuous transformation. Under dynamic conditions, however, firms must repeatedly reassess their resources and modify organizational structures, technologies, knowledge bases, and strategic priorities. Consequently, dynamic capabilities should become more influential as environmental dynamism increases. Research examining entrepreneurial orientation, MSME growth, firm strategic capabilities, and environmental factors supports the view that contextual environmental conditions can alter the strength and direction of relationships among entrepreneurial behaviors, capabilities, and organizational outcomes (Mosonik et al., 2024). This suggests that environmental dynamism should

not merely be treated as a background characteristic but as a potential boundary condition affecting how entrepreneurial orientation and dynamic capabilities contribute to organizational innovation.

The importance of contextual conditions is also apparent in emerging-market research. SMEs in developing and emerging economies frequently operate under resource constraints, institutional uncertainty, rapidly evolving consumer markets, and uneven access to technologies and external support systems. Configurational research across emerging markets has demonstrated that entrepreneurial orientation does not operate uniformly but interacts with strategic networking and other organizational conditions to influence SME performance (Milovanović et al., 2023). Similarly, entrepreneurial orientation has been associated with social media adoption and performance in SMEs, indicating that entrepreneurial firms may derive greater benefit from new technologies when they are able to integrate these tools strategically into their business models (Maharjan et al., 2024). Research on sustainable supply-chain transformation also illustrates how firms and intermediary actors may need to orchestrate networks, knowledge flows, and resources across organizational boundaries in order to respond to complex environmental challenges (Gupta et al., 2024). These findings reinforce the need to understand organizational innovation as an outcome embedded within broader environmental and capability configurations.

Thailand provides a particularly relevant context for investigating these relationships because its SME sector contributes substantially to economic activity while facing increasing competitive, technological, and market pressures. Thai SMEs operate within an environment shaped by digital transformation, regional economic integration, changing consumer expectations, sustainability requirements, and intensifying domestic and international competition. Such conditions create strong incentives for businesses to innovate while simultaneously increasing the risks associated with strategic experimentation. In this context, entrepreneurial orientation may motivate managers to seek new opportunities and challenge established practices, whereas dynamic capabilities may determine whether firms can mobilize resources rapidly enough to benefit from such opportunities. Environmental dynamism may further determine when these internal characteristics become especially important. A firm operating in a relatively stable environment may achieve acceptable performance through incremental improvements, whereas a firm facing rapid

technological and competitive change may depend much more heavily on entrepreneurial action and adaptive capabilities.

The relationship between entrepreneurship, capability development, and sustainability also has implications for understanding organizational innovation more broadly. Entrepreneurial strategic behavior increasingly extends beyond traditional product innovation to encompass process innovation, digital transformation, business-model renewal, supply-chain reconfiguration, and sustainability-oriented practices. Research has demonstrated that entrepreneurial pathways can support sustainability through coordinated human-resource and supply-chain initiatives (Ahmed et al., 2024), while organizational capabilities can facilitate sustainable business performance and adaptation among start-ups (Karan et al., 2024). The orchestration of resources across supply networks further illustrates how innovation may arise from firms' capacity to coordinate multiple actors and respond to environmental pressures (Gupta et al., 2024). Therefore, the contemporary concept of organizational innovation requires attention not only to whether firms introduce new products but also to whether they possess the strategic orientation and adaptive organizational architecture needed to continuously renew themselves.

Despite substantial research on entrepreneurial orientation, dynamic capabilities, and innovation, several gaps remain. First, many studies investigate entrepreneurial orientation and dynamic capabilities separately, leaving limited understanding of their simultaneous and relative contributions to organizational innovation. Second, although the entrepreneurial orientation–performance relationship has been examined extensively, less attention has been given to organizational innovation as a comprehensive outcome encompassing product, service, process, and managerial innovation. Third, the boundary conditions affecting these relationships require further examination. Existing evidence suggests that environmental factors can substantially alter the effects of entrepreneurial and strategic capabilities (Mosonik et al., 2024), yet environmental dynamism is not consistently incorporated as a moderator in models simultaneously including entrepreneurial orientation and dynamic capabilities. Fourth, much of the available evidence comes from specific industries or national settings, including social enterprises, tourism firms, start-ups, internationalizing firms, and digital businesses (Dewi et al., 2024; Lissaneddine, 2026; Satar et al., 2024; Theodosiou et al., 2024). This limits the extent to which established

findings can be generalized to a broader population of SMEs operating in Thailand.

Recent scholarship also suggests that innovation and performance increasingly depend on combinations of capabilities rather than isolated organizational attributes. Entrepreneurial orientation interacts with knowledge creation to support dynamic capability development (Kusumawijaya & Astuti, 2025); entrepreneurial alertness can strengthen pathways toward entrepreneurial orientation and performance in changing environments (Istipliler et al., 2025); digital business strategy can enhance innovation through knowledge-based dynamic capability (Zheng, 2024); and artificial intelligence can create organizational impact through capability-building processes rather than technological investment alone (Schneider et al., 2026). Moreover, firms that integrate entrepreneurial behaviors with strategic learning, resource reconfiguration, digital capabilities, and market responsiveness appear better positioned to achieve sustained innovation and competitive outcomes (Chaudhuri et al., 2023; Tessema et al., 2025; Tipu & Fantazy, 2023). These converging lines of evidence indicate the need for an integrative model that evaluates entrepreneurial orientation and dynamic capabilities simultaneously while recognizing that their innovation effects may depend on the turbulence of the external environment.

Accordingly, examining environmental dynamism as a moderator can provide a more precise explanation of when entrepreneurial orientation and dynamic capabilities are most consequential. Under low dynamism, organizations may have sufficient time to interpret market signals, plan responses, and rely on established competencies, which may weaken the marginal advantage provided by highly entrepreneurial or adaptive behavior. Under high dynamism, however, firms face rapidly changing information, uncertain competitive moves, technological discontinuities, and evolving customer expectations. Such circumstances may reward firms that proactively explore opportunities, tolerate strategic risk, learn quickly, integrate knowledge, and reconfigure resources. The moderation perspective therefore moves beyond asking whether entrepreneurial orientation and dynamic capabilities influence innovation and instead asks whether their effects become stronger when organizations face more turbulent external conditions. This approach can contribute to strategic entrepreneurship and dynamic capability theory while also providing practical implications for SME managers seeking to prioritize scarce

resources under different levels of environmental uncertainty.

The aim of this study was to predict organizational innovation from entrepreneurial orientation and dynamic capabilities and to examine the moderating role of environmental dynamism among SMEs in Thailand.

2 Methods and Materials

The present study employed a quantitative, cross-sectional, correlational research design to examine the extent to which entrepreneurial orientation and dynamic capabilities predict organizational innovation and to determine whether environmental dynamism moderates these relationships. The study population consisted of managers and senior organizational decision-makers working in small and medium-sized enterprises (SMEs) operating in Thailand. SMEs were selected as the research context because these organizations frequently operate under conditions of technological change, competitive pressure, shifting customer preferences, and resource constraints, making entrepreneurial orientation and dynamic capabilities particularly relevant to their capacity for innovation. Participants were recruited from SMEs operating in manufacturing, wholesale and retail trade, information and communication technology, professional and business services, hospitality, and other service-related industries. Eligibility criteria required participants to be at least 18 years old, to hold a managerial, supervisory, executive, owner-manager, or comparable decision-making position, to have worked in their current organization for at least one year, and to possess sufficient knowledge of the organization's strategic activities, competitive environment, and innovation practices. A total of 450 questionnaires were distributed using a combination of purposive and stratified sampling procedures to achieve representation across major business sectors. After questionnaires with substantial missing data or patterned and inconsistent responses were excluded, 412 valid questionnaires remained for statistical analysis, corresponding to a usable response rate of 91.56%. Thus, the final sample consisted of 412 managers and organizational decision-makers from Thai SMEs. Participation was voluntary, and respondents were informed about the purpose of the research, confidentiality of their responses, anonymity of the collected information, and their right to discontinue participation at any stage without penalty. Informed consent was obtained before completion of the questionnaire. No personally identifying information

was included in the analytical dataset, and the collected data were used exclusively for research purposes.

Data were collected using a structured self-report questionnaire composed of demographic and organizational characteristics and standardized measures of entrepreneurial orientation, dynamic capabilities, organizational innovation, and environmental dynamism. Entrepreneurial orientation was assessed on the basis of the established conceptualization encompassing innovativeness, proactiveness, and risk-taking. The instrument evaluated the extent to which an organization emphasizes experimentation and new ideas, actively seeks emerging market opportunities, acts ahead of competitors, and demonstrates a willingness to commit resources to potentially uncertain but strategically promising initiatives. The entrepreneurial orientation measure consisted of nine items adapted from the widely applied scale developed by Covin and Slevin. Respondents rated each statement using a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores reflecting a stronger entrepreneurial orientation. Dynamic capabilities were assessed using a multidimensional measure addressing the organization's capacity to identify changes and opportunities in its environment, integrate and coordinate internal and external resources, learn from experience, and reconfigure organizational resources and competencies in response to changing conditions. The measure included dimensions associated with sensing opportunities and threats, learning and knowledge acquisition, integration and coordination of organizational knowledge, and resource reconfiguration. Items were adapted from established measures of dynamic capabilities, particularly the operationalization proposed by Pavlou and El Sawy, and were rated on the same five-point Likert scale. Higher scores indicated stronger organizational dynamic capabilities.

Organizational innovation constituted the principal dependent variable and was measured through items evaluating the organization's ability to generate, adopt, and implement new or substantially improved products, services, processes, administrative practices, and managerial approaches. The measure was developed on the basis of established organizational innovation instruments and covered both technical and administrative aspects of innovation so that innovation was represented as a broad organizational capability rather than being restricted to new product development. Respondents evaluated statements concerning the introduction of new products or services, improvement of operational processes, adoption of novel

technologies, experimentation with new managerial practices, and implementation of new approaches to organizing work. Responses were recorded on a five-point scale from 1 (strongly disagree) to 5 (strongly agree), with higher composite scores indicating a greater level of organizational innovation. Environmental dynamism was measured as the proposed moderating variable using items assessing the perceived rate, unpredictability, and intensity of change in the organization's external environment. The items addressed fluctuations in customer needs and preferences, technological developments, competitive actions, market conditions, and the predictability of changes within the organization's primary business environment. The scale was adapted from established measures of environmental dynamism and turbulence, with higher scores indicating that respondents perceived their organizational environment as changing rapidly and unpredictably.

Because data were collected in Thailand, the questionnaire was prepared in both English and Thai. The original English items were translated into Thai by a bilingual researcher familiar with management and entrepreneurship terminology and were subsequently back-translated into English by an independent bilingual expert. Differences between the original and back-translated versions were reviewed and resolved to ensure semantic, conceptual, and contextual equivalence. The preliminary Thai-language questionnaire was also reviewed by experts in organizational behavior, entrepreneurship, innovation management, and quantitative research to evaluate the clarity, relevance, and cultural appropriateness of the items. A pilot administration was conducted with a small group of managers who met the main study eligibility criteria but were not included in the final sample. Feedback from the pilot study was used to improve wording and questionnaire clarity without altering the conceptual meaning of the original constructs. Internal consistency reliability was examined using Cronbach's alpha and composite reliability, with coefficients of .70 or higher considered acceptable. Construct validity was evaluated through confirmatory factor analysis, convergent validity, and discriminant validity. Standardized factor loadings, average variance extracted, and composite reliability were examined to establish convergent validity, while the distinctiveness of entrepreneurial orientation, dynamic capabilities, organizational innovation, and environmental dynamism was evaluated before testing the structural relationships among the variables.

Data analysis was conducted using IBM SPSS Statistics and AMOS. Prior to hypothesis testing, the dataset was screened for incomplete responses, data-entry errors, outliers, and violations of the statistical assumptions required for multivariate analysis. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were calculated to summarize participant characteristics and the distributions of the main study variables. The normality of continuous variables was evaluated using skewness and kurtosis indices together with visual inspection of their distributions. Potential multicollinearity among predictor variables was examined through tolerance and variance inflation factor values, while the independence and distribution of residuals were assessed as part of the regression diagnostics. Cronbach's alpha coefficients were initially calculated to determine the internal consistency of each scale. Confirmatory factor analysis was then performed to evaluate the measurement model and verify whether the observed items adequately represented their respective latent constructs. Model adequacy was assessed using several goodness-of-fit indices, including the chi-square to degrees-of-freedom ratio, comparative fit index, Tucker–Lewis index, incremental fit index, root mean square error of approximation, and standardized root mean square residual. Composite reliability and average variance extracted were subsequently calculated to provide additional evidence regarding the reliability and convergent validity of the constructs, and discriminant validity was examined to confirm that the study variables represented empirically distinct concepts.

Pearson correlation coefficients were calculated to determine the direction and magnitude of the bivariate relationships among entrepreneurial orientation, dynamic capabilities, environmental dynamism, and organizational innovation. Hierarchical multiple regression analysis was subsequently employed to test the predictive effects of entrepreneurial orientation and dynamic capabilities on organizational innovation. Relevant demographic and organizational characteristics, including organizational size, organizational age, and business sector, were entered as control variables where appropriate. Entrepreneurial orientation and dynamic capabilities were then entered as the principal predictors. To test the moderating role of environmental dynamism, continuous predictor and moderator variables were mean-centered before interaction terms were created in order to reduce nonessential multicollinearity and facilitate interpretation of the

regression coefficients. Two interaction terms, entrepreneurial orientation $\times$ environmental dynamism and dynamic capabilities $\times$ environmental dynamism, were entered into the regression model after the corresponding main effects. A statistically significant change in explained variance accompanied by a significant coefficient for an interaction term was interpreted as evidence of moderation. When a significant moderating effect was identified, simple slope analysis was conducted to examine the association between the focal predictor and organizational innovation at low, average, and high levels of environmental dynamism, conventionally represented by one standard deviation below the mean, the mean, and one standard deviation above the mean. The coefficient of determination and its change across successive regression models were used to evaluate the incremental explanatory contribution of the predictors and interaction effects. All statistical tests were two-tailed, and the level of statistical significance was set at $p < .05$. This analytical strategy allowed the study to determine both the direct contributions of entrepreneurial orientation and dynamic capabilities to organizational innovation and whether the strength of these relationships varied according to the level of environmental dynamism experienced by Thai SMEs.

3 Findings and Results

The final analytical sample consisted of 412 managers, owner-managers, executives, and senior organizational decision-makers employed in small and medium-sized

enterprises in Thailand. Of the respondents, 230 participants (55.83%) were male and 182 (44.17%) were female. Participants ranged in age from 24 to 61 years, with a mean age of 39.68 years ($SD = 8.74$). Regarding educational attainment, 57 respondents (13.83%) held a diploma or equivalent qualification, 231 (56.07%) held a bachelor's degree, 111 (26.94%) held a master's degree, and 13 (3.16%) held a doctoral degree. In terms of organizational position, 104 respondents (25.24%) were owners or owner-managers, 79 (19.17%) were senior executives, 151 (36.65%) were middle-level managers, and 78 (18.93%) were supervisors or functional managers with direct involvement in organizational decision-making. Participants had worked in their current organizations for an average of 7.86 years ($SD = 5.31$), while their average total managerial experience was 10.42 years ($SD = 6.47$). With respect to organizational characteristics, 157 respondents (38.11%) worked in manufacturing firms, 72 (17.48%) in wholesale and retail businesses, 59 (14.32%) in information and communication technology firms, 46 (11.17%) in hospitality and tourism-related enterprises, 43 (10.44%) in professional and business services, and 35 (8.50%) in other service industries. A total of 169 organizations (41.02%) employed fewer than 50 employees, whereas 243 organizations (58.98%) employed between 50 and 249 employees. The mean organizational age was 11.74 years ($SD = 7.26$). These characteristics indicated that the sample included participants with substantial organizational and managerial experience and represented a heterogeneous range of Thai SMEs operating across several major economic sectors.

Table 1

Descriptive Statistics, Reliability Coefficients, and Correlations among the Main Study Variables

Variable	M	SD	Cronbach's α	1	2	3	4
1. Entrepreneurial Orientation	3.71	0.61	.88	1.00			
2. Dynamic Capabilities	3.76	0.58	.91	.57***	1.00		
3. Environmental Dynamism	3.48	0.66	.86	.29***	.34***	1.00	
4. Organizational Innovation	3.82	0.63	.90	.61***	.67***	.38***	1.00

As presented in Table 1, the mean scores for all principal study variables were above the theoretical midpoint of the five-point response scale, indicating generally favorable levels of entrepreneurial orientation, dynamic capabilities, environmental dynamism, and organizational innovation among the participating Thai SMEs. Organizational innovation had the highest mean score ($M = 3.82$, $SD = 0.63$), followed by dynamic capabilities ($M = 3.76$, $SD = 0.58$), entrepreneurial orientation ($M = 3.71$, $SD = 0.61$), and

environmental dynamism ($M = 3.48$, $SD = 0.66$). The internal consistency coefficients were satisfactory for all measures, with Cronbach's alpha values ranging from .86 for environmental dynamism to .91 for dynamic capabilities, exceeding the conventional threshold of .70 and demonstrating adequate reliability. Pearson correlation analysis showed that entrepreneurial orientation was positively and significantly associated with organizational innovation ($r = .61$, $p < .001$), suggesting that organizations

characterized by greater innovativeness, proactiveness, and willingness to take calculated risks also tended to report stronger innovation outcomes. Dynamic capabilities demonstrated an even stronger positive relationship with organizational innovation ($r = .67, p < .001$), indicating that organizations with greater capacities for sensing opportunities, learning, integrating resources, and reconfiguring competencies tended to demonstrate higher levels of innovation. Environmental dynamism was also positively correlated with organizational innovation ($r = .38,$

$p < .001$), while entrepreneurial orientation and dynamic capabilities were moderately correlated with one another ($r = .57, p < .001$). Although the predictors were significantly interrelated, none of the correlations approached a magnitude that would indicate problematic redundancy or severe multicollinearity. Overall, the correlational findings provided preliminary support for the expected positive relationships among the central constructs and justified proceeding to measurement-model assessment and multivariate hypothesis testing.

Table 2

Measurement Model, Construct Reliability, and Convergent Validity

Construct	Number of Items	Standardized Loading Range	Composite Reliability	AVE
Entrepreneurial Orientation	9	.68–.84	.90	.56
Dynamic Capabilities	12	.70–.87	.93	.61
Environmental Dynamism	6	.69–.85	.88	.55
Organizational Innovation	10	.71–.88	.92	.59

The confirmatory factor analysis supported the adequacy of the four-factor measurement model. As shown in Table 2, all standardized factor loadings were statistically significant and exceeded .60, ranging from .68 to .84 for entrepreneurial orientation, .70 to .87 for dynamic capabilities, .69 to .85 for environmental dynamism, and .71 to .88 for organizational innovation. These results indicated that the observed questionnaire items were strongly associated with their intended latent constructs. Composite reliability coefficients ranged from .88 to .93 and were therefore above the recommended minimum criterion of .70, providing further evidence of adequate internal consistency. Average variance extracted values ranged from .55 to .61, with each construct exceeding the commonly accepted threshold of .50, thereby demonstrating adequate convergent validity. The overall measurement model also demonstrated acceptable to strong

goodness of fit, $\chi^2/df = 2.31$, CFI = .95, TLI = .94, IFI = .95, RMSEA = .056, and SRMR = .047. The comparative fit index, Tucker–Lewis index, and incremental fit index were all close to or above .95, while RMSEA and SRMR were below .06 and .05, respectively, indicating that the proposed measurement structure represented the observed data well. Discriminant validity was also considered satisfactory because the constructs remained empirically distinguishable and the correlations among them were below levels suggestive of construct overlap. Accordingly, the measurement analysis indicated that entrepreneurial orientation, dynamic capabilities, environmental dynamism, and organizational innovation represented reliable and distinct constructs, providing an appropriate basis for testing the predictive and moderating relationships proposed in the study.

Table 3

Hierarchical Regression Analysis Predicting Organizational Innovation

Predictor	B	SE	β	t	p
Model 1: Control variables					
Organizational size	0.07	0.04	.07	1.55	.122
Organizational age	0.01	0.01	.05	1.08	.282
Business sector	0.03	0.02	.06	1.29	.198
Model 2: Main predictors					
Organizational size	0.04	0.03	.04	1.14	.255
Organizational age	0.01	0.01	.03	0.82	.414
Business sector	0.02	0.02	.04	1.02	.309
Entrepreneurial Orientation	0.36	0.04	.35	8.47	<.001
Dynamic Capabilities	0.48	0.05	.44	10.19	<.001

Environmental Dynamism			0.12	0.04	.12	3.12	.002
Model	R	R ²	Adjusted R ²	ΔR ²	F	p	
Model 1	.16	.03	.02	.03	3.52	.015	
Model 2	.75	.56	.55	.53	85.42	<.001	

The hierarchical regression results presented in Table 3 demonstrated that entrepreneurial orientation and dynamic capabilities made substantial independent contributions to the prediction of organizational innovation. In the first model, organizational size, organizational age, and business sector collectively explained only 3% of the variance in organizational innovation, $R^2 = .03$, adjusted $R^2 = .02$, $F = 3.52$, $p = .015$. Although the overall control-variable model reached statistical significance, none of the individual control variables demonstrated a statistically significant unique contribution at the .05 level. After entrepreneurial orientation, dynamic capabilities, and environmental dynamism were entered in Model 2, the explanatory power of the model increased substantially to $R^2 = .56$ and adjusted $R^2 = .55$. The addition of the principal study variables explained an additional 53% of the variance in organizational innovation, $\Delta R^2 = .53$, and the overall regression equation was statistically significant, $F = 85.42$, $p < .001$. Entrepreneurial orientation positively predicted organizational innovation ($B = 0.36$, $SE = 0.04$, $\beta = .35$, $t = 8.47$, $p < .001$), indicating that, after accounting for the other

predictors, higher entrepreneurial orientation was associated with substantially greater organizational innovation. Dynamic capabilities exhibited the strongest standardized direct effect on innovation ($B = 0.48$, $SE = 0.05$, $\beta = .44$, $t = 10.19$, $p < .001$), suggesting that the capacity to sense environmental change, acquire and integrate knowledge, coordinate resources, and reconfigure competencies was particularly important for innovation performance. Environmental dynamism also had a smaller but statistically significant positive direct association with organizational innovation ($B = 0.12$, $SE = 0.04$, $\beta = .12$, $t = 3.12$, $p = .002$). Thus, organizations operating in more rapidly changing environments reported somewhat higher levels of innovation after entrepreneurial orientation, dynamic capabilities, and organizational characteristics were controlled. Taken together, these findings demonstrated that entrepreneurial orientation and dynamic capabilities were robust predictors of organizational innovation and that their explanatory contribution was substantially greater than that of the background organizational characteristics.

Table 4

Moderating Effect of Environmental Dynamism on the Relationships of Entrepreneurial Orientation and Dynamic Capabilities with Organizational Innovation

Predictor	B	SE	β	t	p
Organizational size	0.03	0.03	.03	0.93	.354
Organizational age	0.01	0.01	.02	0.64	.522
Business sector	0.02	0.02	.03	0.84	.401
Entrepreneurial Orientation	0.34	0.04	.33	8.18	<.001
Dynamic Capabilities	0.45	0.05	.42	9.66	<.001
Environmental Dynamism	0.13	0.04	.13	3.45	.001
Entrepreneurial Orientation $\times$ Environmental Dynamism	0.15	0.04	.14	3.79	<.001
Dynamic Capabilities $\times$ Environmental Dynamism	0.19	0.04	.17	4.62	<.001
Model statistic	Value				
R	.78				
R ²	.61				
Adjusted R ²	.60				
ΔR^2 attributable to interaction terms	.05				
F	78.94				
p	<.001				

The moderation analysis provided evidence that environmental dynamism significantly strengthened the relationships of both entrepreneurial orientation and

dynamic capabilities with organizational innovation. After the two interaction terms were added to the regression equation, the model explained 61% of the total variance in

organizational innovation, $R^2 = .61$, adjusted $R^2 = .60$, $F = 78.94$, $p < .001$. Importantly, the interaction terms accounted for an additional 5% of the variance beyond the control variables and main effects, indicating a meaningful incremental contribution of the moderating effects. The interaction between entrepreneurial orientation and environmental dynamism was positive and statistically significant ($B = 0.15$, $SE = 0.04$, $\beta = .14$, $t = 3.79$, $p < .001$). This result indicated that the positive association between entrepreneurial orientation and organizational innovation became stronger as environmental dynamism increased. In relatively stable environments, entrepreneurial orientation remained positively related to innovation, but the relationship was less pronounced. Under conditions characterized by rapidly changing technologies, customer preferences, competitor behavior, and market requirements, entrepreneurial orientation became considerably more important for explaining organizational innovation. The interaction between dynamic capabilities and environmental dynamism was also positive and statistically significant ($B = 0.19$, $SE = 0.04$, $\beta = .17$, $t = 4.62$, $p < .001$). This interaction was somewhat stronger than the entrepreneurial orientation interaction, indicating that dynamic capabilities were especially valuable for innovation when firms operated under turbulent and unpredictable external conditions. The significant interaction coefficients therefore supported the proposed moderating role of environmental dynamism for both principal predictor variables.

Simple slope analyses were conducted to clarify the nature of these interaction effects. At a low level of environmental dynamism, defined as one standard deviation below the mean, entrepreneurial orientation remained a significant positive predictor of organizational innovation, $B = 0.24$, $SE = 0.05$, $t = 4.80$, $p < .001$. At the mean level of environmental dynamism, the relationship increased to $B = 0.34$, $SE = 0.04$, $t = 8.18$, $p < .001$, while at a high level of environmental dynamism, defined as one standard deviation above the mean, the slope increased further to $B = 0.44$, $SE = 0.05$, $t = 8.80$, $p < .001$. A similar pattern was observed for dynamic capabilities. At low environmental dynamism, dynamic capabilities significantly predicted organizational innovation, $B = 0.32$, $SE = 0.05$, $t = 6.40$, $p < .001$. At the mean level of environmental dynamism, the coefficient increased to $B = 0.45$, $SE = 0.05$, $t = 9.66$, $p < .001$, and at high environmental dynamism, the relationship was strongest, $B = 0.58$, $SE = 0.06$, $t = 9.67$, $p < .001$. These patterns indicated that although entrepreneurial orientation and dynamic capabilities were beneficial across different environmental conditions, their importance for innovation became progressively greater as the external environment became more dynamic. The findings therefore suggest that environmental turbulence does not merely create pressure on SMEs; rather, it increases the strategic value of entrepreneurial behavior and organizational capacities for adaptation and resource reconfiguration.

Figure 1

Moderating Effects of Environmental Dynamism on the Relationships of Entrepreneurial Orientation and Dynamic Capabilities with Organizational Innovation

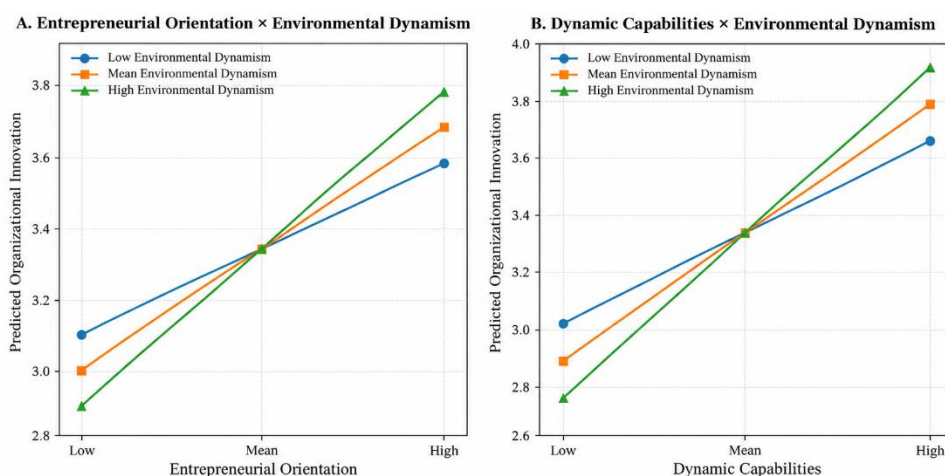


Figure 1 illustrates the interaction patterns identified in the moderation analysis. The slopes depicting the

relationship between entrepreneurial orientation and organizational innovation were positive at low, moderate,

and high levels of environmental dynamism; however, the slope became progressively steeper as environmental dynamism increased. This pattern demonstrates that entrepreneurial orientation produced stronger innovation benefits in highly dynamic environments than in comparatively stable environments. Likewise, the relationship between dynamic capabilities and organizational innovation was positive across all three levels of environmental dynamism, but its magnitude increased substantially under conditions of high dynamism. Organizations possessing strong dynamic capabilities therefore displayed particularly high levels of innovation when they faced rapid and unpredictable changes in technologies, customer expectations, competitive practices, and market conditions. Conversely, organizations with weaker dynamic capabilities appeared less able to translate environmental change into innovation outcomes. Taken together, the interaction plots reinforce the regression findings and demonstrate that environmental dynamism functions as an amplifying contextual condition. Rather than weakening the contribution of entrepreneurial orientation or dynamic capabilities, increasing environmental dynamism strengthened the innovation-related value of both organizational attributes, with the moderating effect being somewhat more pronounced for dynamic capabilities.

Overall, the findings provided consistent support for the proposed relationships among the study variables. Entrepreneurial orientation was positively associated with and significantly predicted organizational innovation, demonstrating that SMEs characterized by innovativeness, proactiveness, and calculated risk-taking were more likely to develop and implement new products, services, processes, and managerial practices. Dynamic capabilities emerged as the strongest direct predictor of organizational innovation, emphasizing the importance of continuously sensing opportunities and threats, acquiring and integrating knowledge, coordinating organizational resources, and reconfiguring competencies in response to environmental change. Environmental dynamism demonstrated both a positive direct association with organizational innovation and significant moderating effects. Specifically, the positive effects of entrepreneurial orientation and dynamic capabilities on innovation became stronger as the perceived level of environmental dynamism increased. The final regression model accounted for approximately 61% of the variance in organizational innovation, indicating substantial explanatory power. Consequently, the empirical results supported the proposition that organizational innovation in

Thai SMEs is influenced not only by internal strategic orientations and adaptive capabilities but also by the degree of dynamism characterizing the external environment in which these organizations operate.

4 Discussion

The present study examined the predictive roles of entrepreneurial orientation and dynamic capabilities in organizational innovation and investigated whether environmental dynamism moderated these relationships among SMEs in Thailand. The findings demonstrated that entrepreneurial orientation was positively and significantly associated with organizational innovation, dynamic capabilities had an even stronger positive effect on organizational innovation, and environmental dynamism was also positively related to innovation. More importantly, environmental dynamism significantly strengthened the effects of both entrepreneurial orientation and dynamic capabilities on organizational innovation. The final model explained a substantial proportion of the variance in organizational innovation, indicating that these strategic and capability-related factors jointly provide a meaningful explanation of innovation outcomes in Thai SMEs. Overall, the findings support the proposition that innovation is not generated by a single organizational attribute but emerges from the interaction between entrepreneurial strategic orientation, adaptive organizational capabilities, and the degree of change occurring in the external environment.

The first major finding was that entrepreneurial orientation significantly predicted organizational innovation. This result indicates that SMEs characterized by greater innovativeness, proactiveness, and willingness to take calculated risks are more likely to introduce new products and services, improve organizational processes, adopt new managerial approaches, and experiment with emerging market opportunities. Entrepreneurial orientation appears to provide a strategic behavioral foundation for innovation because it encourages organizations to move beyond established routines and actively search for new possibilities. Firms with stronger entrepreneurial orientation are more likely to tolerate uncertainty, allocate resources to exploratory activities, recognize emerging customer needs, and respond to competitive opportunities before rivals. The present finding is strongly aligned with the systematic review conducted by Fu et al., which highlighted the consistent relationship between entrepreneurial orientation and innovation across a broad range of organizational

settings (Fu et al., 2024). It is also consistent with research showing that entrepreneurial orientation contributes to sustainable innovation capabilities by facilitating learning and strategic experimentation in new ventures (Yu et al., 2023). Thus, entrepreneurial orientation can be considered an important mechanism through which organizations create behavioral conditions favorable to innovation.

The positive effect of entrepreneurial orientation can also be explained through its contribution to organizational learning, opportunity recognition, and strategic responsiveness. Entrepreneurially oriented organizations tend to seek information actively, challenge dominant assumptions, and pursue opportunities even when outcomes remain uncertain. These behaviors facilitate exposure to new ideas and improve the probability that an organization will identify changing market requirements before competitors. Tessema et al. demonstrated that entrepreneurial orientation can contribute to competitive advantage through knowledge sharing and market orientation, suggesting that the strategic benefits of entrepreneurial behavior are closely linked to organizational processes that allow information and knowledge to be transformed into action (Tessema et al., 2025). Similarly, research on SMEs has shown that entrepreneurial orientation contributes to social media adoption and improved performance, indicating that entrepreneurially oriented firms may be more willing to integrate new technologies and communication channels into their business activities (Maharjan et al., 2024). The current results therefore suggest that the innovation advantages associated with entrepreneurial orientation may arise partly because proactive and risk-tolerant firms are better positioned to recognize and exploit emerging technological and market opportunities.

The findings are also compatible with research emphasizing the role of entrepreneurial orientation in digitalization and organizational transformation. Nugroho and Heykal found that entrepreneurial orientation plays an important role in the relationship between information technology adoption, digitalization, and firm performance, implying that technological resources alone may not generate substantial organizational benefits without a strategic orientation that supports experimentation and change (Nugroho & Heykal, 2023). Likewise, Satar et al. reported that firm-level entrepreneurial orientation contributes to the relationship between digital capabilities and social innovation performance in social enterprises (Satar et al., 2024). These studies reinforce the present finding by showing that entrepreneurial orientation is not

simply an abstract strategic attitude; rather, it shapes the extent to which firms are willing and able to transform technological and organizational opportunities into innovation outcomes. This interpretation is particularly relevant to SMEs, where resource constraints make strategic prioritization critical and where proactive entrepreneurial behavior may compensate partially for limitations in scale and formalized research and development infrastructure.

The second major finding was that dynamic capabilities significantly predicted organizational innovation and showed the strongest direct effect among the principal predictors. This finding suggests that the ability to sense environmental changes, acquire and integrate knowledge, coordinate resources, and reconfigure organizational competencies is particularly important for innovation. Innovation requires more than identifying opportunities. Organizations must also possess the capacity to mobilize financial, human, technological, and informational resources in ways that allow those opportunities to be realized. Dynamic capabilities provide this adaptive mechanism by enabling organizations to update routines and reorganize their resource base as environmental requirements change. The present result aligns with Karan et al., who emphasized the role of dynamic capabilities in supporting organizational sustainability among start-ups by enabling firms to adjust continuously to changing market conditions (Karan et al., 2024). It is also consistent with Dewi et al., who demonstrated that dynamic capability and innovation capability are important contributors to performance among e-business start-ups (Dewi et al., 2024).

The stronger effect of dynamic capabilities compared with entrepreneurial orientation may indicate that strategic willingness to innovate is insufficient unless it is accompanied by the organizational capacity to execute change. A firm may be highly proactive and willing to pursue new opportunities, but without appropriate knowledge integration, coordination, resource reconfiguration, and organizational learning, such opportunities may not be converted into implemented innovation. Dynamic capabilities therefore represent the operational bridge between entrepreneurial intent and organizational outcomes. This explanation is supported by research showing that entrepreneurial orientation and knowledge creation can jointly strengthen dynamic capabilities, which in turn contribute to firm performance (Kusumawijaya & Astuti, 2025). Octasyilva et al. likewise proposed that entrepreneurial orientation and social capital contribute to the development of dynamic capabilities,

suggesting that entrepreneurial behavior creates opportunities while dynamic capabilities provide mechanisms for translating those opportunities into organizational adaptation (Octasyilva et al., 2023). The current findings extend this logic by demonstrating that, when examined simultaneously, dynamic capabilities provide a particularly strong explanation of organizational innovation.

The results are further supported by studies emphasizing the relationship between dynamic capabilities, strategic flexibility, and organizational performance. Kusumastuti found that entrepreneurial orientation, learning orientation, and dynamic capability are associated with strategic flexibility and SME performance, highlighting the importance of adaptive capabilities in allowing firms to respond effectively to changing conditions (Kusumastuti, 2023). Chaudhuri et al. similarly showed that entrepreneurial leadership, organizational resources, and capabilities are important for sustainable organizational performance, suggesting that performance outcomes depend on the coordinated deployment of resources and capabilities rather than on possession of resources alone (Chaudhuri et al., 2023). From this perspective, the strong role of dynamic capabilities observed in the present study is theoretically coherent because organizational innovation itself requires repeated adaptation, integration, and transformation of organizational resources.

The finding is also consistent with emerging research on knowledge-based and technology-enabled dynamic capabilities. Zheng demonstrated that knowledge-based dynamic capability plays an important role in connecting digital business strategy with innovation performance (Zheng, 2024). This supports the proposition that firms derive innovation benefits from digital strategies when they are capable of acquiring, integrating, and applying knowledge effectively. Similarly, Schneider et al. emphasized that artificial intelligence generates organizational and sustainability impact through the development and deployment of dynamic capabilities rather than through technological adoption alone (Schneider et al., 2026). Naz et al. also found that big data analytics and artificial intelligence capabilities are associated with stronger organizational performance, indicating that the ability to integrate advanced technologies with organizational decision-making processes can create competitive value (Naz et al., 2023). Taken together, these findings support the current conclusion that dynamic capabilities are critical because they enable firms to

continuously transform new information and technological possibilities into practical organizational innovation.

The present study also found that environmental dynamism had a positive direct association with organizational innovation. This result suggests that SMEs operating under more rapidly changing and unpredictable conditions may experience stronger incentives to innovate. Dynamic environments are characterized by frequent shifts in customer needs, technological developments, competitive actions, supply conditions, and market structures. Such changes can render existing organizational routines less effective and increase pressure on firms to introduce new products, processes, and managerial practices. Environmental dynamism may therefore stimulate innovation by disrupting organizational stability and creating both threats and opportunities that require adaptive responses. Although dynamism increases uncertainty, it can simultaneously encourage firms to search more intensively for novel solutions and new market positions.

The most important contextual finding was that environmental dynamism significantly moderated the relationship between entrepreneurial orientation and organizational innovation. Specifically, the positive effect of entrepreneurial orientation on innovation became stronger as environmental dynamism increased. This suggests that entrepreneurial orientation is particularly valuable when firms operate under rapidly changing and unpredictable conditions. In stable environments, firms may continue to succeed through established products, routines, and incremental adjustments. In dynamic environments, however, organizations must act proactively, recognize emerging opportunities quickly, and tolerate greater uncertainty. The dimensions of entrepreneurial orientation therefore become increasingly relevant when market and technological conditions are unstable. This result is consistent with Istiqliler et al., who showed that entrepreneurial alertness in dynamic environments contributes to entrepreneurial orientation and organizational performance (Istipliler et al., 2025). Their findings support the idea that dynamic contexts increase the strategic importance of opportunity recognition and entrepreneurial behavior.

The moderating role of environmental dynamism also aligns with findings concerning environmental conditions, strategic capabilities, and MSME growth. Mosonik et al. reported that environmental factors and firm strategic capabilities influence the relationship between entrepreneurial orientation and business outcomes,

demonstrating that the effectiveness of entrepreneurial orientation depends partly on contextual conditions (Mosonik et al., 2024). The present study extends this argument specifically to organizational innovation. When environmental change is limited, entrepreneurial actions may produce incremental advantages; however, when technologies, competitors, and customer expectations change rapidly, proactive opportunity seeking and calculated risk-taking can become decisive mechanisms for innovation. In such contexts, entrepreneurial orientation enables firms to move ahead of competitors and respond before existing opportunities disappear.

The interaction between entrepreneurial orientation and environmental dynamism can also be interpreted through the configurational perspective. Milovanović et al. showed that entrepreneurial orientation operates in combination with strategic networking and other organizational conditions in explaining SME performance in emerging markets (Milovanović et al., 2023). This suggests that entrepreneurial orientation does not generate identical outcomes across all organizational environments. Instead, its effects depend on complementary organizational and contextual factors. In the present study, environmental dynamism functioned as one such contextual factor, increasing the value of entrepreneurial orientation for organizational innovation. This finding is also compatible with Ahmed et al., who conceptualized entrepreneurial orientation as an important strategic mechanism for supporting sustainability-oriented organizational initiatives (Ahmed et al., 2024). Environments characterized by sustainability pressures, regulatory changes, and evolving stakeholder expectations may reward entrepreneurially oriented firms because such firms are more prepared to experiment with new organizational and operational approaches.

Environmental dynamism also significantly moderated the relationship between dynamic capabilities and organizational innovation, and this interaction was somewhat stronger than the corresponding interaction involving entrepreneurial orientation. This finding suggests that dynamic capabilities become especially important when external conditions are unstable. In dynamic environments, existing resources and routines can become obsolete rapidly, making the ability to sense, seize, integrate, and reconfigure resources particularly valuable. Firms with weak dynamic capabilities may recognize environmental changes but remain unable to respond effectively because their organizational structures, knowledge systems, and resource

allocation processes are too rigid. In contrast, firms with strong dynamic capabilities can convert environmental turbulence into innovation opportunities by reorganizing their competencies and reallocating resources more rapidly.

This result is consistent with Theodosiou et al., who found that dynamic capabilities play a central role in connecting international entrepreneurial orientation with performance and business strategy (Theodosiou et al., 2024). In internationally competitive and rapidly changing contexts, dynamic capabilities allow firms to transform strategic orientation into adaptive action. Similarly, Karan et al. emphasized that dynamic capabilities are essential for organizational sustainability because they help firms adapt to uncertain and changing business environments (Karan et al., 2024). The present findings suggest that the innovation benefits of dynamic capabilities are amplified as environmental dynamism increases, supporting the fundamental logic of dynamic capability theory: these capabilities become most valuable precisely when organizations face substantial change.

The moderation finding is also supported by research examining technological and digital transformation. Lissaneddine showed that digital transformation can mediate relationships between entrepreneurial orientation dimensions and organizational resilience, particularly in organizational contexts characterized by uncertainty and the need for adaptation (Lissaneddine, 2026). Similarly, Tipu and Fantazy demonstrated that big data analytics capability contributes to sustainable supply-chain performance through entrepreneurial characteristics such as innovativeness, proactiveness, and risk-taking (Tipu & Fantazy, 2023). Gupta et al. further emphasized the importance of ecosystem orchestration in transforming sustainable food supply chains, showing that organizations increasingly need to coordinate resources, knowledge, and external actors in complex environments (Gupta et al., 2024). These studies reinforce the present conclusion that organizational capabilities acquire greater strategic importance when environmental complexity and turbulence increase.

Taken together, the findings provide support for an integrated perspective on organizational innovation. Entrepreneurial orientation appears to provide the motivational and strategic impetus for innovation, whereas dynamic capabilities provide the organizational mechanisms required to implement and sustain innovation. Environmental dynamism then shapes the strength of these effects by determining how necessary entrepreneurial and adaptive behaviors become. This interpretation is consistent

with the broader literature suggesting that innovation and organizational performance emerge from combinations of entrepreneurial behavior, learning, digital capability, resource orchestration, and environmental responsiveness rather than from any single organizational characteristic (Chaudhuri et al., 2023; Kusumawijaya & Astuti, 2025; Satar et al., 2024). The results therefore contribute to the literature by showing that entrepreneurial orientation and dynamic capabilities make distinct but complementary contributions to organizational innovation and that these contributions become stronger in more dynamic environments.

Several limitations should be considered when interpreting the findings. First, the cross-sectional design limits the possibility of drawing definitive causal conclusions regarding the relationships among entrepreneurial orientation, dynamic capabilities, environmental dynamism, and organizational innovation. Although the proposed relationships were theoretically grounded and statistically significant, the temporal ordering of the variables cannot be established conclusively from data collected at a single point in time. Second, the study relied primarily on self-reported questionnaire data obtained from managers and organizational decision-makers, which may introduce common-method variance, social desirability bias, and perceptual distortion. Respondents may have evaluated their organizations' entrepreneurial orientation, capabilities, and innovation more positively than would have been indicated by objective measures. Third, the use of one key informant from each organization may not fully capture the perspectives of employees working at different organizational levels or functional areas. Fourth, although the sample included SMEs from several sectors in Thailand, differences across industries, geographical regions, ownership structures, and firm developmental stages may influence the generalizability of the results. Fifth, environmental dynamism was measured as a perceived organizational condition, and subjective perceptions may differ from objectively measured technological, competitive, or market volatility. Finally, organizational innovation was examined as a broad construct, and the study did not test whether entrepreneurial orientation and dynamic capabilities have different effects on specific types of innovation such as product, process, technological, administrative, or business-model innovation.

Future studies should extend the present findings by employing longitudinal and multi-wave research designs that can clarify the temporal and potentially causal

relationships among entrepreneurial orientation, dynamic capabilities, environmental dynamism, and organizational innovation. Researchers could collect data at multiple time points to determine whether entrepreneurial orientation contributes to the development of dynamic capabilities over time and whether these capabilities subsequently generate innovation outcomes. Multi-source designs would also strengthen methodological rigor by obtaining information from owners, senior managers, employees, customers, and archival organizational records rather than relying on a single respondent. Future research could incorporate objective indicators such as numbers of new products, patents, digital innovations, process improvements, research and development expenditures, or revenue generated from recently introduced offerings. Comparative research across countries and emerging economies would help determine whether institutional, cultural, and regulatory environments alter the relationships observed in Thailand. Researchers should also distinguish among different dimensions of entrepreneurial orientation and different types of dynamic capabilities to determine which specific components are most important for innovation. Further studies could investigate whether environmental dynamism exhibits nonlinear effects or whether other contextual factors, such as environmental hostility, technological turbulence, market uncertainty, competitive intensity, digital maturity, organizational culture, leadership style, absorptive capacity, and knowledge-sharing climate, operate as additional moderators or mediators. Finally, configurational approaches could be used to identify alternative combinations of entrepreneurial orientation, dynamic capabilities, digital capabilities, networking, and environmental conditions that lead to high organizational innovation.

The findings provide several practical implications for owners and managers of SMEs. Managers should recognize that organizational innovation requires both an entrepreneurial strategic posture and the organizational capabilities needed to implement strategic change. Firms should therefore encourage employees and managers to identify emerging opportunities, propose new ideas, experiment with alternative solutions, and engage in calculated risk-taking while simultaneously developing systems that support rapid learning, knowledge sharing, cross-functional coordination, and resource reconfiguration. Managers should establish regular mechanisms for scanning technological developments, customer preferences, competitor behavior, and regulatory changes so that

emerging opportunities and threats can be identified early. Investment in digital information systems, employee training, knowledge-management practices, flexible organizational structures, and cross-functional teams can strengthen the organization's ability to respond quickly to new information. SMEs operating in highly dynamic environments should place particular emphasis on strengthening dynamic capabilities because the results indicate that these capabilities become increasingly valuable as external change accelerates. Strategic planning processes should therefore remain flexible rather than excessively rigid, allowing resources to be redirected toward emerging opportunities when necessary. Managers should also avoid treating innovation as the sole responsibility of research and development units; instead, innovation should be embedded across marketing, operations, human resources, supply-chain management, customer service, and strategic decision-making. By simultaneously cultivating entrepreneurial orientation and dynamic capabilities, SMEs can improve their capacity to transform environmental uncertainty into opportunities for sustained organizational innovation.

5 Conclusion

The results have relevance for understanding innovative behavior across different organizational contexts. Much of the existing evidence has emerged from higher education, public institutions, banking, hospitality, small firms, and other sector-specific settings (Bui et al., 2025; Fatoki, 2023; Zreen et al., 2021). The present findings suggest that the theoretical relationships among high-performance work practices, organizational support, engagement, and innovation are also meaningful among employees in Argentina. Although cross-national conclusions should be made cautiously, this contributes to the geographical diversification of evidence on innovative work behavior. It also supports the broader proposition that organizational resources and psychological engagement may represent relatively general mechanisms for fostering employee innovation, even though their strength may vary across institutional and cultural contexts.

Several limitations should be considered when interpreting the findings. First, the cross-sectional design prevents firm causal conclusions regarding the direction of relationships among high-performance work practices, perceived organizational support, employee engagement, and innovative work behavior. Although the proposed model was theoretically grounded and statistically supported,

reciprocal relationships are possible; for example, highly engaged or innovative employees may evaluate organizational practices more positively. Second, all variables were measured using self-report questionnaires, which may have increased the possibility of common method variance, social desirability, and consistency bias. Third, participants were selected through convenience sampling, which may limit the representativeness of the sample and reduce the extent to which the findings can be generalized to the full Argentine workforce. Fourth, the sample included employees from different sectors and occupations, and the model did not explicitly account for possible sectoral, occupational, organizational-size, or managerial-level differences. Finally, although the model explained a substantial proportion of variance in innovative work behavior, other important predictors and mechanisms, including psychological safety, leadership style, knowledge sharing, job autonomy, organizational justice, creativity, and innovation climate, were not incorporated.

Future studies should use longitudinal and time-lagged designs to clarify the temporal ordering of high-performance work practices, perceived organizational support, employee engagement, and innovative work behavior. Experimental or quasi-experimental studies could also provide stronger evidence regarding causal mechanisms. Researchers should consider collecting data from multiple sources, such as combining employee reports of organizational practices and engagement with supervisor ratings of innovative work behavior, in order to reduce common method bias. Probability sampling across multiple Argentine regions and organizational sectors would improve representativeness and allow more robust comparisons across industries. Future research could also test whether the proposed model differs according to age, gender, organizational tenure, managerial level, employment sector, or organizational size. Additional mediators such as psychological empowerment, organizational identification, affective commitment, knowledge sharing, creativity, and psychological safety could be incorporated into more comprehensive models, while moderators such as leadership style, innovation climate, procedural justice, job autonomy, and organizational culture could help identify the conditions under which high-performance work practices and organizational support are most effective in promoting innovation.

Organizations seeking to strengthen innovative work behavior should treat innovation as the outcome of both formal management systems and employees' day-to-day

psychological experience of the organization. Human resource managers should develop coherent high-performance work systems that combine selective recruitment, continuous training, meaningful performance feedback, employee participation, information sharing, fair recognition, and opportunities for career development. These practices should be implemented in ways that employees perceive as developmental and supportive rather than as mechanisms for increasing pressure alone. Managers should also actively strengthen perceived organizational support by recognizing employee contributions, responding constructively to employee concerns, providing assistance when problems arise, and demonstrating consistent concern for employee well-being. Because employee engagement emerged as a central mechanism, organizations should create jobs and work environments that support energy, meaningfulness, autonomy, involvement, and sustained concentration. Supervisors should encourage employees to propose and test new ideas without excessive fear of punishment for reasonable failure, provide resources for idea development, and recognize both successful innovations and constructive experimentation. By combining supportive HR practices with an organizational climate that values employees and strengthens engagement, organizations can create conditions in which innovative behavior becomes a sustainable part of everyday work rather than an occasional response to managerial demands.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

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Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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