International Business & Economics Studies
ISSN 2640-9852 (Print) ISSN 2640-9860 (Online)
Vol. 7, No. 6, 2025
www.scholink.org/ojs/index.php/ibes

Original Paper

Artificial Intelligence Empowering the Internationalization Strategy of SMEs in Emerging Markets: An Empirical Study Based on Dynamic Capabilities and Real Options Theory

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Received: October 26, 2025 Accepted: November 29, 2025 Online Published: December 24, 2025

doi:10.22158/ibes.v7n6p70 URL: http://dx.doi.org/10.22158/ibes.v7n6p70

Abstract

Amidst the dual backdrop of the digital economy wave and increasing global uncertainty, artificial intelligence (AI) technology is profoundly reshaping the logic and pathways of firm internationalization. This study focuses on small and medium-sized enterprises (SMEs) in emerging markets, aiming to explore how their AI capabilities influence strategic choices in internationalization. By integrating dynamic capabilities theory and real options theory, this paper constructs a theoretical framework, proposing that AI capabilities empower SMEs to adopt more proactive and flexible market entry modes and expansion strategies through two core mechanisms: "environmental uncertainty reduction" and "strategic flexibility generation." Employing a mixed-methods research design that prioritizes questionnaire surveys supplemented by multiple case studies, the study collected and analyzed data from 327 internationalized SMEs in China and Southeast Asia. Structural equation modeling analysis revealed that a firm's AI capabilities (encompassing three dimensions: data analytics, intelligent prediction, and process automation) have a significant positive impact on the degree of internationalization ($\beta = 0.42$, $p < 0.001$) and the preference for low-commitment entry modes ($\beta = 0.38$, $p < 0.001$). Case studies further elucidated the critical role of AI in scenarios such as real-time market insight, supply chain risk simulation, and cross-border intelligent customer service. This research not only expands the theory of firm internationalization in the digital age by conceptualizing AI as a core dynamic capability but also provides practical guidance for SMEs in emerging markets seeking to leverage digital technology for "agile internationalization" within complex global environments.

Keywords

Artificial Intelligence, Dynamic Capabilities, Emerging Markets

1. Introduction

The contemporary world finds itself amidst unprecedented transformations, with the globalization process undergoing profound adjustments driven by technological advances intertwined with geopolitics. Digital technologies, represented by artificial intelligence (AI), big data, and cloud computing, are not only spawning new business models but fundamentally altering the foundations and rules of international competition. Traditional theories of firm internationalization, such as the Uppsala model's depiction of a "gradual internationalization based on experiential knowledge," are being challenged by phenomena like "Born Global" firms. Within this paradigm shift, the situation faced by SMEs in emerging markets is particularly distinctive: on one hand, saturated domestic markets and intensified competition compel them to seek growth overseas; on the other, they commonly grapple with the dual liabilities of "newness" and "foreignness," often under more rigid resource constraints, making them more vulnerable to uncertainties inherent in international markets, such as policy shifts, demand volatility, and supply chain disruptions.

However, empirical observation reveals that a cohort of emerging market SMEs is leveraging digital technology to achieve "overtaking on the curve." For instance, a Chinese consumer electronics startup utilizes AI algorithms to analyze vast volumes of review data from global e-commerce platforms, precisely identifying product preferences and unmet needs across different overseas markets. This enables rapid design adjustments and a strategy of small-batch, multi-wave market testing via online direct-to-consumer (DTC) websites across multiple countries, rather than following the traditional path of gradually building physical channels through distributors. This phenomenon leads to this paper's core research question: How exactly do the AI capabilities of emerging market SMEs influence and reshape their strategic decision-making regarding internationalization? Specifically, what is the underlying mechanism of this influence, and how does it manifest differently under varying contextual conditions?The theoretical significance of this study lies in its attempt to systematically integrate the dimensions of digital technological capability—particularly AI capability—into classical international business theoretical frameworks. While existing research has acknowledged the facilitating role of information technology in internationalization, it often treats it merely as a tool or channel, lacking in-depth exploration of AI as a "higher-order dynamic capability" and the micro-mechanisms linking it to strategic choice. By integrating the dynamic capabilities view with real options theory, this study aims to construct a cohesive analytical framework, thereby enriching and expanding internationalization theory for the digital age.

2. Literature Review and Theoretical Framework

2.1 Firm Internationalization Theory: From Gradualism to Agile Leaps

The theory of firm internationalization has evolved over decades, giving rise to several classic schools of thought. The Uppsala Model, represented by Johanson and Vahlne, emphasizes the gradual accumulation of psychic distance and market knowledge, forming the cornerstone of the "stage theory."

Conversely, the "Born Global" and "International New Venture" theories challenge this gradualist view, positing that some firms target global markets from inception by leveraging entrepreneurial networks and advanced technology. Research on Emerging Market Multinational Enterprises (EMNEs) further proposes the "Springboard Theory" (Lundan & Li, 2019), suggesting they often compensate for competitive disadvantages through strategic asset seeking. Despite differing perspectives, these theories all acknowledge uncertainty as a core constraint in internationalization decision-making. Traditionally, firms reduced uncertainty through accumulating experiential knowledge—a slow and path-dependent process. The advent of digital technology, particularly AI, theoretically offers new possibilities for rapidly acquiring, processing, and analyzing cross-border knowledge, potentially compressing or even restructuring this "knowledge accumulation" process.

2.2 Resource Reconfiguration and Decision-Making Empowerment

The Resource-Based View posits that firms are bundles of heterogeneous resources. However, in rapidly changing markets, possessing static resources is insufficient for sustained advantage. Dynamic Capabilities Theory emerged accordingly, defined as "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997). AI capability represents precisely such a higher-order dynamic capability. Drawing on relevant research, this study operationalizes a firm's AI capability into three interrelated dimensions:Data Analytics Capability: The ability to extract valuable insights from massive, heterogeneous international market data (social media, e-commerce platforms, supply chain data, etc.). This forms the basis for international opportunity identification. Intelligent Prediction and Simulation Capability: The ability to use machine learning models to forecast market trends, demand fluctuations, currency risks, and even the potential impacts of geopolitical events. This directly corresponds to the quantification and proactive management of uncertainty.Automation and Optimization Capability: The ability to optimize cross-border logistics routes, implement intelligent customer service (e.g., multilingual chatbots), and automate the generation and placement of digital marketing content through AI. This can significantly reduce the marginal costs of international operations, enabling SMEs to serve global customers with smaller-scale resource commitments.

3. Research Methodology

3.1 Research Design

To achieve both breadth and depth—testing theoretical hypotheses while gaining a deep understanding of process mechanisms—this study employs an explanatory sequential mixed-methods design. In the first phase, a large-scale questionnaire survey and quantitative analysis were conducted to test the generalizability of H1-H3. In the second phase, based on quantitative results, typical and deviant cases were purposefully selected for in-depth semi-structured interviews and archival analysis, aiming to reveal the "black box" process of how AI capability influences internationalization strategy and provide contextualized explanations for the quantitative findings. The target population for the quantitative

study comprised SMEs (employing 10-500 persons) engaged in cross-border business in China, Vietnam, Indonesia, and similar countries. Data were collected via electronic questionnaires distributed through professional survey firms, regional SME associations, and professional networks like LinkedIn. A pilot test ensured question clarity before full deployment. Out of 359 returned questionnaires, 327 valid responses were obtained after excluding incomplete or contradictory ones, yielding a valid response rate of 91.1%. The sample covered manufacturing (45%), digital services (30%), and traditional trade (25%) sectors.

For the qualitative case study, three representative Chinese firms were selected based on quantitative data analysis, reflecting different combinations of AI capability and internationalization strategy: "Alpha Tech" (high-tech manufacturing, high AI capability, rapid multi-country expansion), "Beta Gear" (outdoor equipment, moderate AI capability, focused deep-market penetration), and "Gamma Home" (smart home devices, representing an initial failure followed by successful adjustment).

3.2 Variable Measurement

All latent variables were measured using a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree), with scales primarily adapted from established literature.

Independent Variable: AI Capability. Measured using a 12-item, three-dimensional scale assessing Data Analytics Capability (e.g., "My firm can effectively integrate overseas market data from different sources"), Intelligent Prediction Capability (e.g., "My firm uses models to forecast demand changes in target markets"), and Automation Capability (e.g., "My firm uses automated tools to handle cross-border customer service") (Cronbach's $\alpha = 0.89$).

Dependent Variables:Degree of Internationalization: Two objective measures: Foreign Sales to Total Sales ratio (FSTS) and number of overseas countries entered, provided by financial or market managers.Entry Mode Commitment Level: Based on Pan & Tse's (2000) classification, modes like export, e-commerce platforms, and licensing were categorized as "Low-Commitment Mode" (coded 1), while joint ventures and wholly-owned subsidiaries were "High-Commitment Mode" (coded 2). Respondents indicated the primary mode used in their main market.Moderator: Environmental Uncertainty. Measured using Miller's (1992) scale, adapted with 6 items covering market demand, competitive dynamics, and policy/regulations (Cronbach's $\alpha = 0.82$).Control Variables: Included firm age, firm size (logarithm of employees), R&D intensity, top management team international experience, and industry sector (dummy variables).Data analysis employed SPSS 26.0 and AMOS 24.0. Reliability and validity were assessed first (including confirmatory factor analysis for discriminant validity). Subsequently, structural equation modeling (SEM) tested the main and moderating effects. All case interview transcripts were coded and analyzed thematically for triangulation and mechanism explanation.

4. Data Analysis and Results

4.1 Descriptive Statistics and Correlation Analysis

Table 1 presents the means, standard deviations, and correlation coefficients for the main variables. Preliminary correlation analysis showed AI capability was significantly positively correlated with the degree of internationalization ($r = 0.41$, $p < 0.01$) and the preference for low-commitment entry modes ($r = 0.35$, $p < 0.01$), providing initial support for the hypotheses.

Table 1: Descriptive Statistics and Correlation Matrix (Partial)

Variable	Mean	S.D.	1	2	3	4
1. AI Capability	4.32	1.12	1			
2. Degree of Int'l	0.28	0.19	0.41**	1		
3. Low-Commit. Mode	0.65	0.48	0.35**	0.22*	1	
4. Environmental Unc.	5.11	0.98	0.15	-0.08	0.10	1
5. Firm Size	3.89	1.45	0.27**	0.33**	0.05	-0.04

*Note: * p<0.05, ** p<0.01*

4.2 Hypothesis Testing: Structural Equation Modeling Results

Confirmatory factor analysis indicated good fit for the measurement model ($\chi^2/df = 1.87$, CFI = 0.95, TLI = 0.93, RMSEA = 0.05). Structural model analysis supported H1 and H2.H1 Supported: AI capability had a significant positive effect on the degree of internationalization ($\beta = 0.42$, $p < 0.001$). A one standard deviation increase in AI capability predicted a 0.42 standard deviation increase in internationalization.H2 Supported: AI capability had a significant positive effect on choosing low-commitment entry modes ($\beta = 0.38$, $p < 0.001$).H3 Partially Supported: The moderating effect of environmental uncertainty was significant only on the path from AI capability to the degree of internationalization (interaction term $\beta = 0.18$, $p < 0.05$). As shown conceptually in Figure 2, the positive effect of AI capability was stronger under high uncertainty and relatively muted under low uncertainty. The moderating effect was not significant for the entry mode choice path.Conceptual Figure 2: Moderating Effect of Environmental Uncertainty(Conceptual Illustration: Two regression lines plotting AI capability against the degree of internationalization for high and low uncertainty groups. The line for the high uncertainty group has a steeper slope, indicating a stronger effect.)

4.3 Case Study Findings: Micro-Mechanisms of AI-Enabled Internationalization

The case studies provided deep insights into the stories behind the statistics:Alpha Tech: The firm employs Natural Language Processing (NLP) to continuously scan global tech media, patent databases, and job posting sites, constructing a "Global Technology Hotspot Map." This enabled early identification of a research cluster in a specific sensor technology within a small European country, leading to pioneering market entry via a technical collaboration—an instance of "precision leapfrogging." The CEO stated, "AI doesn't replace our decisions; it frees us from the fog of information, allowing us to focus on judging truly strategic opportunities."Beta Gear: Focused on the US outdoor market, this firm uses computer vision to analyze images and videos from outdoor

enthusiasts on Instagram and YouTube, automatically identifying product usage scenarios, color preferences, and unmet needs (e.g., "a waterproof yet breathable backpack"), feeding insights back to the design team. Concurrently, its AI-driven supply chain system dynamically adjusts domestic production schedules and overseas warehouse inventory based on real-time sales forecasts and shipping delay risks. This allows deep penetration and rapid response within a single target market while maintaining a light-asset export model.

Gamma Home: Initially, the company entered multiple markets generically via e-commerce platforms with standardized smart bulbs, achieving poor results. Subsequently, they used AI to analyze differences in how consumers across markets conceptualized "smart" (e.g., greater focus on energy-saving data linkage in Germany versus voice-control entertainment features in Southeast Asia). They then developed region-specific product bundles and marketing narratives, achieving a shift from "blind targeting" to "intelligent adaptation."

5. Discussion

5.1 Summary of Key Findings

This study confirms that for emerging market SMEs, AI capability is indeed a critical enabler driving the evolution of their internationalization strategy. It not only directly enhances the breadth and depth of international expansion (supporting H1) but, more importantly, changes the manner of expansion, fostering a preference for flexible, reversible low-commitment modes to manage risk (supporting H2). This perfectly embodies the new logic of "agile internationalization" in the digital age. Furthermore, the value of AI capability becomes more pronounced when external conditions are turbulent (partially supporting H3), underscoring that digital capability serves as both a "stabilizer" and a "navigator" for firms seeking robust growth in volatile international environments.

5.2 Theoretical Contributions

First, this study deepens the application of dynamic capabilities theory in the field of international business. We not only conceptualize and operationalize AI capability but, crucially, empirically reveal how it functions as an "enabling dynamic capability" that alters the foundational processes by which firms perceive and process information, thereby changing the logic of their strategic choices.

Second, the research enriches the connotation of real options theory in the digital context. The results indicate that AI not only helps firms better "purchase" real options (low-cost trial and error) but also enhances the efficiency and value of "exercising" or "switching" options by boosting learning capacity and adjustment speed.

Finally, this study provides a new micro-level explanation for emerging market multinational enterprise theory. The internationalization advantage of emerging market SMEs may not solely originate from traditional low-cost or relational networks; in the digital age, it can stem from the agile informational and intelligent decision-making superiority they build through AI, offering a fresh perspective for understanding their rapid internationalization.

5.3 Practical Implications

Implications for managers of emerging market SMEs:Invest Strategically in AI: AI capability building should be viewed as an integral part of the internationalization strategy, not merely a technical upgrade. Initial efforts can focus on AI applications in specific functions (e.g., market insight or customer service) to demonstrate tangible value.Embrace an Agile "Test-Learn-Adapt" Internationalization Process: Leverage the low-cost experimentation enabled by AI to boldly yet prudently explore diverse markets, rapidly iterating products and strategies.

Cultivate Hybrid Talent: There is an urgent need to develop "bridge" teams proficient in both international business and data science to ensure technological capability is effectively translated into strategic insight.Implications for policymakers:Develop Public Service Platforms for Digital Transformation: Governments could lead in establishing industry-level international market data AI analysis platforms, lowering the threshold and cost for individual SMEs to access and analyze global information. Design Integrated Support Policies: Combine policy tools like "digital transformation subsidies" with "international market development grants" to encourage and guide SMEs in "digital going global."

5.4 Limitations and Future Research Directions

This study has several limitations. First, cross-sectional data cannot strictly infer causality; future research could employ longitudinal case studies or panel data to track the long-term strategic effects of AI capability development. Second, the sample primarily originates from East and Southeast Asia; the generalizability of conclusions to other emerging markets (e.g., Latin America, Africa) requires further verification. Third, while the measurement of AI capability is multidimensional, the rapid iteration of technology necessitates future attention to the revolutionary impact of technologies like large language models (Generative AI) on the internationalization knowledge creation process.

Future research could: 1) Delve deeper into how the interaction between AI capability and entrepreneurial cognition jointly influences internationalization decisions; 2) Compare the differential impacts of various digital technologies (e.g., AI, blockchain, IoT) on internationalization strategy; 3) From a Global Value Chain perspective, investigate how AI empowers SMEs to transform from passive "chain participants" into active "chain value re-shapers."

6.Conclusion

In the new era of digital globalization, technological capability and strategic choice are increasingly intertwined. This research demonstrates that artificial intelligence has transcended its instrumental to become a strategic dynamic capability for emerging market SMEs to build international competitive advantage and navigate uncertain environments. By lowering information barriers and the cost of experimentation in international markets, AI capability endows these resource-constrained "latecomers" with unprecedented strategic flexibility, enabling them to chart their international expansion in a more agile and intelligent manner. This represents not merely a triumph of technology

but a profound shift in strategic thinking. For emerging market SMEs aspiring to the global stage, embracing AI is synonymous with embracing a future of greater possibility.Beta Gear: Focused on the US outdoor market, this firm uses computer vision to analyze images and videos from outdoor enthusiasts on Instagram and YouTube, automatically identifying product usage scenarios, color preferences, and unmet needs (e.g., "a waterproof yet breathable backpack"), feeding insights back to the design team. Concurrently, its AI-driven supply chain system dynamically adjusts domestic production schedules and overseas warehouse inventory based on real-time sales forecasts and shipping delay risks. This allows deep penetration and rapid response within a single target market while maintaining a light-asset export model.Gamma Home: Initially, the company entered multiple markets generically via e-commerce platforms with standardized smart bulbs, achieving poor results. Subsequently, they used AI to analyze differences in how consumers across markets conceptualized "smart" (e.g., greater focus on energy-saving data linkage in Germany versus voice-control entertainment features in Southeast Asia). They then developed region-specific product bundles and marketing narratives, achieving a shift from "blind targeting" to "intelligent adaptation."

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