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The impact of international entrepreneurial orientation and open innovation on the international performance of Chinese SMEs in cross-border e-commerce: A quantitative study

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Abstract: The advent of digital technologies and the intensification of globalization have driven the transformation of cross-border e-commerce (CBEC) into a disruptive force in global trade, effectively overcoming the spatial constraints of traditional business models [1, 2]. In this evolving environment, the present research investigates how international entrepreneurial orientation (IEO) influences the international performance (IP) of Chinese SMEs engaged in CBEC, with a specific focus on the mediating effect of open innovation (OI). Grounded in resource-based theory, both IEO and OI are conceptualized as strategic intangible resources that contribute to competitive advantage in global markets. A total of 289 SMEs from Yiwu, China—a recognized hub for CBEC—participated in a cross-sectional survey and provided primary data. Mediation testing was carried out using SPSS 30.0 and the PROCESS Macro (Model 4), applying 5,000 bootstrap iterations. The findings indicate that IEO significantly enhances IP both directly and indirectly via OI. These results underscore the importance of cultivating open innovation capabilities—particularly in sourcing and applying external knowledge—to convert entrepreneurial intent into successful internationalization outcomes. The study offers practical implications for digitally oriented SMEs in emerging economies and contributes to ongoing scholarship in international entrepreneurship and innovation management.

Keywords: *Chinese SMEs, Cross-border E-commerce, Digital Globalization, International Entrepreneurial Orientation, International Performance, Mediation Analysis, Open Innovation, Resource-Based Theory.*

1. Introduction

In recent years, CBEC has reshaped the landscape of international trade by offering SMEs an alternative path to global markets. Rather than relying on traditional physical expansion, many firms now leverage digital platforms to reach foreign consumers, supported by advances in technology, logistics integration, and data-driven ecosystems [3]. In China, this digital infrastructure has enabled rapid internationalization among SMEs by lowering entry barriers and reducing reliance on conventional intermediaries. However, these advantages do not eliminate the structural constraints SMEs continue to face. Limited financial and human capital, underdeveloped international marketing skills, and fierce competition from larger or more digitally sophisticated players remain critical obstacles [4]. Many firms struggle with low brand visibility, weak differentiation, and a dependence on low-cost, imitation-based strategies that often lead to price-based competition [5]. Moreover, SMEs often lack the agility to adapt to changing platform algorithms and the institutional capabilities to navigate complex regulatory environments. Their overreliance on dominant e-commerce platforms can further restrict their strategic flexibility. As these challenges continue, it becomes essential to determine which internal capabilities equip SMEs for success in digital global environments.

Among various firm-level capabilities, IEO has been widely recognized as a key strategic posture that enhances SME internationalization. Firms with high levels of IEO are characterized by

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innovativeness, proactiveness, and a willingness to take risks in seizing international opportunities [6, 7]. Prior studies suggest that firms with strong IEO tend to internationalize earlier, adapt more flexibly to foreign market dynamics, and develop unique offerings tailored to international customer needs. In fast-moving CBEC settings—where low entry barriers and high transparency prevail—IEO may be especially critical for SMEs to discover and exploit niche opportunities. Yet despite its relevance, empirical research has largely overlooked how IEO contributes to IP in the CBEC context, especially within emerging markets. This raises a need to investigate underlying mechanisms that transform entrepreneurial intent into sustained international outcomes under digital and resource-constrained conditions.

Characterized by the deliberate transfer of knowledge between firms, OI offers a valuable framework for enhancing innovation and value creation, although it remains insufficiently examined in the literature [8]. OI encompasses both inbound innovation (e.g., integrating external knowledge from customers or partners) and outbound innovation (e.g., sharing internal innovations with external actors). For SMEs with limited internal R&D capacity, OI offers an opportunity to access external expertise, co-create value, and reduce innovation costs [9, 10]. Firms exhibiting entrepreneurial orientation may be better positioned to engage in OI, thereby enhancing their ability to convert strategic posture into performance outcomes. However, OI' s mediating role in the IEO–IP relationship has not been empirically validated, particularly within CBEC ecosystems in emerging economies.

To bridge this research gap, the present study examines how IEO affects the IP of Chinese SMEs engaged in CBEC, with particular emphasis on the mediating role of OI. Drawing on resource-based theory (RBT) [11] the research conceptualizes IEO and OI as strategic intangible resources that drive international competitiveness. By empirically examining the IEO–OI–IP pathway, this study advances theoretical understanding by revealing how entrepreneurial capabilities are translated into international performance through innovation mechanisms. It further provides actionable implications for SME practitioners and policymakers aiming to strengthen digital competitiveness and expand global presence by leveraging strategic openness and innovation-driven capabilities.

This research advances the existing literature in three key respects. First, it integrates IEO and OI within the under-explored context of CBEC in emerging markets. Second, it reconceptualizes OI not solely as a standalone strategic asset, but as an intermediary process that transforms entrepreneurial orientation into IP outcomes. Third, it provides empirical evidence from Chinese SMEs—particularly those operating within Yiwu's digital trade clusters—thereby strengthening the contextual grounding and practical relevance of the findings.

2. Literature Review and Hypotheses Development

2.1. Resource-Based Theory (RBT)

Rooted in strategic management, RBT argues that a firm's unique resource portfolio and internal competencies are essential for sustaining long-term market advantage [12]. To create strategic value, these resources—including tangible assets, intellectual property, human resources, and organizational know-how—are typically characterized as valuable, rare, inimitable, and non-substitutable (VRIN) [13, 14]. Capabilities, in this context, denote the ability of a firm to coordinate, mobilize, and apply such resources effectively to deliver value and attain superior performance. RBT highlights that performance differences across firms stem from heterogeneity in their resource bases and capabilities [15, 16]. While the theory traditionally focuses on internal firm assets, it also acknowledges the role of external factors in shaping how resources are accessed, developed, and converted into strategic outcomes [17]. This study frames IEO as a form of strategic intangible asset. By embedding an entrepreneurial mindset into international decision-making, IEO enables firms—particularly SMEs in resource-constrained environments like China—to develop the cognitive flexibility and strategic agility necessary for identifying and capitalizing on cross-border opportunities [6, 7].

However, RBT also emphasizes that possessing strategic resources alone does not ensure competitive advantage; firms must be able to mobilize, recombine, and apply these resources effectively

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in dynamic environments [18]. Within this framework, OI—characterized by the deliberate exchange of knowledge across organizational boundaries [19]—is positioned as a mechanism that enables firms to leverage IEO and convert it into international value. OI enables firms to absorb external knowledge (inbound innovation) and commercialize internal ideas externally (outbound innovation), facilitating the transformation of entrepreneurial intent into market responsiveness and innovation outcomes [20, 21]. This is particularly important in CBEC environments, which demand speed, external collaboration, and digital agility. For Chinese SMEs operating in CBEC settings, OI allows firms to overcome constraints in tangible resources by tapping into knowledge networks and converting strategic intent into globally competitive offerings [22, 23]. Accordingly, this study draws on RBT to theorize how IEO, when operationalized through OI, contributes to international performance in digitally driven, high-velocity global markets.

2.2. International Entrepreneurial Orientation and International Performance

IEO can be conceptualized as a strategic orientation that embodies a firm's commitment to seizing international opportunities through adaptive and future-oriented behavior. As defined by Knight and Cavusgil [6] IEO captures the entrepreneurial behaviors that support firms in pursuing opportunities and achieving competitive advantages beyond domestic boundaries. Each of its three dimensions plays a distinct role in facilitating international performance. Proactiveness enables firms to anticipate market changes and respond swiftly to emerging global trends [24]. Innovativeness refers to a firm's ability to create novel products or services that meet the evolving needs of international markets [25] whereas risk-taking reflects its willingness to navigate uncertainty in unfamiliar environments or commit resources to unproven strategic initiatives [26].

A growing body of empirical evidence supports the positive linkage between IEO and firms' IP. Prior studies have indicated that firms with stronger entrepreneurial postures often experience enhanced export expansion, deeper penetration into foreign markets, and greater success in achieving strategic objectives [27, 28]. However, existing research indicates that the core elements of IEO may yield divergent effects on firm performance. Dai, et al. [29] identified nonlinear relationships, where both innovativeness and proactiveness followed U-shaped effects on internationalization, while excessive risk-taking appeared detrimental. Jin and Cho [30] further observed that while proactiveness and risk-taking were positively associated with international outcomes, the effect of innovativeness appeared relatively constrained—potentially due to conceptual overlaps or contextual limitations.

In the context of CBEC, the expression of IEO may differ from that in traditional international business models. Innovative SMEs often enhance their global performance by developing digitally optimized products or services tailored to online consumers. Proactive firms are more adept at tracking algorithmic changes on e-commerce platforms and identifying underserved market segments. Firms with a higher propensity for risk-taking are better equipped to navigate regulatory uncertainty, shifting logistics conditions, and volatile international demand. These entrepreneurial attributes may help CBEC-based Chinese SMEs overcome resource limitations and seize time-sensitive digital opportunities.

Hypothesis 1 (H1): International Entrepreneurial Orientation is positively associated with the international performance of Chinese SMEs engaged in CBEC.

2.3. International Entrepreneurial Orientation and Open Innovation

IEO encourages firms to explore, absorb, and apply external knowledge in pursuit of global innovation opportunities [6]. Firms exhibiting strong IEO are more likely to seek new technologies, experiment with novel solutions, and engage in cross-border collaborations—behaviors that closely align with OI practices. Prior research demonstrates that entrepreneurial firms frequently adopt both inbound and outbound OI activities, such as external idea sourcing, co-development, and commercialization through external channels [31]. Thus, IEO can be regarded as a key antecedent of OI, enabling firms to transform entrepreneurial intent into collaborative innovation capabilities.

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In the context of CBEC, the link between IEO and OI becomes particularly salient. Digitally enabled trade environments require SMEs to continuously scan external knowledge sources, adapt to platform dynamics, and co-create with international stakeholders. Jin and Hurd [32] found that SMEs using Alibaba's platform effectively leveraged external knowledge and user engagement to refine products and penetrate foreign markets. Similarly, Naqshbandi [33] showed that firms with strong strategic orientation and external managerial ties tend to develop absorptive capacity, which in turn facilitates OI. Accordingly, the following hypothesis is formulated:

Hypothesis 2 (H2): International Entrepreneurial Orientation positively influences Open Innovation among Chinese SMEs engaged in CBEC.

2.4. Open Innovation and International Performance

OI refers to the strategic integration of external knowledge and partnerships to enhance a firm's innovation capability and competitive advantage [19]. It is commonly categorized into two dimensions: inbound OI, which focuses on acquiring and assimilating external ideas and technologies; and outbound OI, which emphasizes the external commercialization of internally developed knowledge [34]. OI thus serves as a strategic lever for SMEs, enabling them to offset internal R&D limitations by leveraging external partnerships to access knowledge, reduce costs, and strengthen innovation capacity within the resource-based framework [35].

However, the benefits of OI are not automatic. To this end, effectively managing external knowledge flows is essential for firms seeking to avoid coordination inefficiencies and a diluted strategic focus. Faems, et al. [36] caution that excessive resource heterogeneity can increase complexity and undermine innovation efforts. Therefore, the effectiveness of OI is contingent upon a firm's capacity to align external knowledge inputs with its internal innovation activities, particularly in highly uncertain and fast-changing environments.

Within CBEC, OI facilitates the rapid adaptation of Chinese SMEs to evolving platform mechanisms, changing consumer demands, and the complexities of fragmented international laws. Inbound OI allows companies to utilize user feedback, partner insights, and external technologies to improve their offerings for global markets. Outbound OI supports the commercialization of internal capabilities, such as digital designs and data tools, through licensing or collaborative platform development. These techniques collectively enhance international responsiveness, drive innovation, and increase strategic flexibility [37, 38]. In accordance with the findings of this study, a novel hypothesis is proposed:

Hypothesis 3 (H3): Open innovation positively influences the international performance of Chinese SMEs engaged in CBEC.

2.5. The Mediating Role of Open Innovation

Despite the prevalence of strong entrepreneurial ambition among Chinese SMEs, this drive often fails to translate directly into measurable international success, particularly within the dynamic and highly digitized environment of CBEC. Structural barriers, such as limited financial and human resources and insufficient innovation capabilities, frequently impede firms from achieving successful global outcomes in achieving their strategic goals.

In this context, OI serves as a strategic channel through which firms access external knowledge, technologies, and market signals to enhance their innovation processes [39]. Integrating inbound and outbound knowledge flows improves an organization's adaptability and responsiveness, essential qualities for navigating uncertainties in digitally driven international markets [40].

Moreover, OI strengthens the effectiveness of entrepreneurial strategies by acting as an operational bridge between intent and implementation [41]. Rather than functioning in isolation, IEO and OI are mutually reinforcing. Entrepreneurial firms are more likely to pursue experimentation, collaboration, and exploration beyond firm boundaries, while OI ensures that these behaviors can be effectively channeled into innovation and market expansion. Thus, OI functions not simply as a complementary

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resource, but as a strategic mechanism through which entrepreneurial orientation is transformed into measurable international performance outcomes.

Hypothesis 4 (H4): Open Innovation mediates the relationship between International Entrepreneurial Orientation and the international performance of Chinese SMEs engaged in CBEC.

Accordingly, the theoretical model of this study is presented in Figure 1.

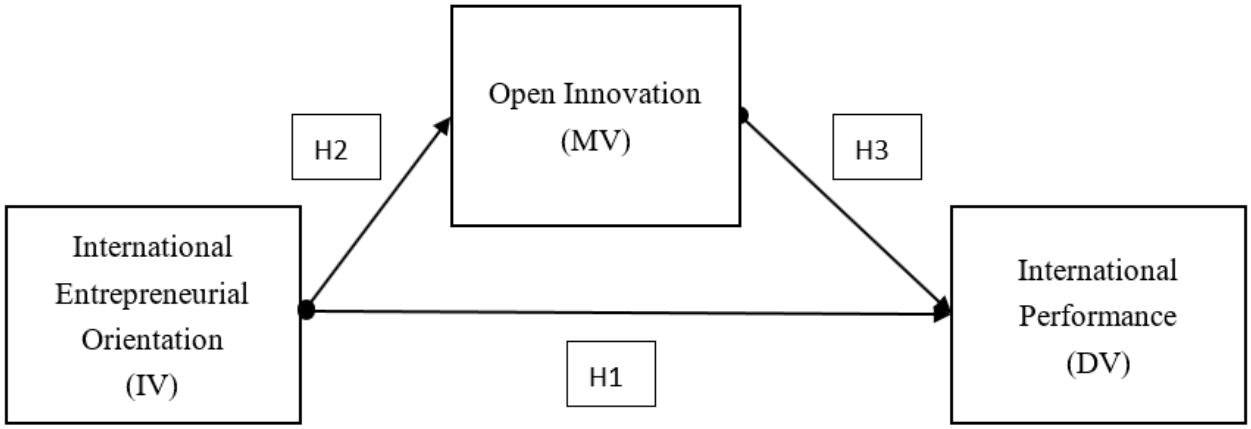

Figure 1.
The conceptual framework of open innovation's mediating role in the international performance of Chinese CBEC SMEs

3. Research Methodology

This study adopts a quantitative research design to investigate the relationships among IEO, OI, and IP in Chinese SMEs engaged in CBEC. The methodology outlines the sampling strategy, data collection procedures, variable measurement, and pilot testing conducted to ensure the reliability and validity of the research findings.

3.1. Sample Selection and Data Collection

This study targeted Chinese SMEs engaged in CBEC through platforms such as Alibaba, AliExpress, Amazon, and Shopee, with a focus on firms located in major digital trade hubs like Yiwu. A purposive sampling method was adopted to identify respondents—typically firm owners or middle and senior managers—with direct knowledge of international operations and innovation practices [42]. To minimize potential common method bias, data were collected via Wenjuanxing in two waves approximately two months apart [43]. Out of 311 responses, a total of 289 valid questionnaires were retained after excluding incomplete submissions and ineligible cases. The final sample exceeded the recommended minimum for regression-based mediation analysis, and statistical power was verified through GPower 3.1 calculations [44]. All participation was voluntary, anonymous, and in accordance with ethical research guidelines.

The respondent profile shows that most participants held middle (38.8%) or senior (31.1%) managerial positions, and had been with their firms for 5 to 10 years, indicating strong familiarity with firm strategy and operations. The sampled firms were primarily concentrated in the accessories (43.6%) and apparel (37.0%) categories, aligning with China's CBEC export structure. In terms of firm size, over half employed fewer than 100 staff, and the majority reported annual sales between ¥1 million and ¥3 million. These attributes confirm the contextual relevance and representativeness of the sample for studying the internationalization dynamics of Chinese CBEC SMEs.

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3.2. Measurement of Variables

To ensure content validity, multi-item scales drawn from previously validated instruments were employed for all constructs. These measures were slightly adjusted to better reflect the unique features of Chinese SMEs engaged in CBEC. Respondents rated each item using a five-point Likert scale (1 = "strongly disagree," 5 = "strongly agree"). The questionnaire was originally prepared in English and later translated into Chinese through a back-translation technique to maintain semantic accuracy [45]. A preliminary test with 20 CBEC practitioners was conducted to evaluate wording clarity and contextual fit. All constructs yielded Cronbach's alpha values above 0.80, confirming satisfactory internal reliability of the measures.

Although IEO and OI were measured using items reflecting multiple subdimensions—three for IEO (innovativeness, proactiveness, and risk-taking) and two for OI (inbound and outbound innovation)—both constructs were treated as unidimensional in the main analysis. This approach is consistent with prior studies that conceptualize these constructs as higher-order reflective factors (e.g., [7, 46]) and is supported by high reliability scores and factor loadings observed in the current study.

3.3. Independent Variable: International Entrepreneurial Orientation

The IEO was assessed using 12 questions derived from previously validated scales, including its core components of innovativeness, proactiveness, and risk-taking (e.g., [6, 7]). The features were refined based on expert feedback and field interviews to guarantee their relevance for Chinese SMEs in the CBEC context.

3.4. Mediating Variable: Open Innovation (OI)

The measurement of OI entailed the utilization of a set of 14 items, meticulously allocated between inbound and outbound innovation activities. The measurement scale was adapted from prior validated studies (e.g., [20, 46-48]) to capture external knowledge sourcing and sharing behaviors among Chinese SMEs.

3.5. Dependent Variable: International Performance (IP)

The assessment of IP was conducted using a set of five items that reflect both financial and non-financial outcomes. Outcome measures span a range of dimensions, including growth in foreign sales, organizational image, and alignment with strategic intentions. The scale was adapted from previously validated instruments (e.g., [49-52]) and revised to suit the CBEC context of Chinese SMEs.

4. Empirical Analysis

4.1. Reliability and Validity Assessment

Reliability was assessed using Cronbach's alpha, with all constructs exceeding the recommended 0.70 threshold [53]. The coefficients ranged from 0.842 to 0.908, indicating strong internal consistency. Among the constructs, OI showed the highest reliability ($\alpha = 0.908$), followed by IP ($\alpha = 0.875$) and IEO ($\alpha = 0.842$), supporting the robustness of the scales for subsequent analysis.

Given the high internal consistency and coherent construct structure, both IEO and OI—though measured using items reflecting multiple subdimensions—were treated as unidimensional constructs in subsequent analyses. This approach ensures model parsimony and is aligned with established practice in prior studies (e.g., [7, 46]).

Exploratory factor analysis (EFA) using principal component extraction with Varimax rotation was conducted to assess construct validity. The Kaiser–Meyer–Olkin (KMO) measure yielded a value of 0.903, suggesting excellent sampling adequacy for factor analysis [54]. Additionally, Bartlett's Test of Sphericity produced a highly significant result ($\chi^2 = 4598.351$, df = 465, $p < .001$), reinforcing the dataset's suitability [55]. Six factors with eigenvalues above 1 were extracted, explaining 65.89% of the total variance, thus satisfying the threshold typically associated with acceptable convergent validity

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([53] Table 2). All retained items loaded strongly on their respective factors (0.723–0.815), exceeding the standard cutoff of 0.50 (Table 3). Furthermore, 30 out of 31 items had communalities greater than 0.60 (M = 0.658; Min = 0.580), indicating robust shared variance. Collectively, these findings confirm the measurement model's reliability and construct validity in the CBEC setting.

Table 1.
KMO and Bartlett's Test.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.903
Bartlett's Test of Sphericity	Approx. Chi-Square	4598.351
	df	465
	Sig.	<.001

Table 2.
Total Variance Explained.

Total Variance Explained			
	Extraction Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**
1	8.614	27.788	27.788
2	3.560	11.483	39.272
3	2.679	8.640	47.912
4	2.146	6.921	54.833
5	1.767	5.700	60.533
6	1.662	5.360	65.893
Extraction Method: Principal Component Analysis.			

Table 3.
Rotated Component Matrixa.

Rotated Component Matrix[a]						
	Component					
	1	**2**	**3**	**4**	**5**	**6**
IP1			0.726			
IP2			0.746			
IP3			0.803			
IP4			0.795			
IP5			0.794			
IEOP1						0.739
IEOP2						0.802
IEOP3						0.801
IEOP4						0.740
IEOR1				0.737		
IEOR2				0.812		
IEOR3				0.749		
IEOR4				0.775		
IEOI1					0.723	
IEOI2					0.792	
IEOI3					0.806	
IEOI4					0.775	
OII1	0.783					
OII2	0.795					
OII3	0.815					
OII4	0.753					
OII5	0.800					
OII6	0.743					

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OII7	0.772					
OIO1		0.731				
OIO2		0.760				
OIO3		0.776				
OIO4		0.749				
OIO5		0.760				
OIO6		0.745				
OIO7		0.784				

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax without Kaiser Normalization.[a]

Note: a. Rotation converged in 6 iterations.

4.2. Descriptive Statistics and Correlation Analysis

The descriptive statistics and Pearson correlation coefficients for the study's primary constructs have been documented in Tables 4 to 6. The observed mean values, ranging from 3.74 to 3.91, indicate that respondents generally exhibited moderately positive attitudes toward IEO, OI, and IP. Standard deviations varied between 0.62 and 0.86, reflecting an acceptable degree of dispersion in the responses. As presented in Table 4, all variables had skewness and kurtosis values within the ±1 range, indicating that the data conformed to the assumption of normal distribution [53]. The Pearson correlation results indicated significant positive associations among the key study constructs. Both IEO and OI exhibited significant positive correlations with IP, with correlation coefficients of $r = 0.431$ ($p < 0.01$) and $r = 0.404$ ($p < 0.01$), respectively. In addition, IEO and OI were significantly correlated ($r = 0.334$, $p < 0.01$), offering initial support for the proposed mediation pathway ([56] see Table 5)[56]. To assess multicollinearity among predictors, collinearity diagnostics were performed. All predictors showed acceptable tolerance levels (> 0.70) and low VIFs (5), with IEO and OI reporting values of 0.849/1.178 and 0.783/1.276, respectively, indicating no multicollinearity issues (see Table 6).

Table 4.
Descriptive Statistics.

Descriptive Statistics									
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**	**Skewness**		**Kurtosis**	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Statistic**	**Std. Error**	**Statistic**	**Std. Error**
IP	289	1.40	5.00	3.7550	0.85638	-0.546	0.143	-0.637	0.286
IEOP	289	1.25	5.00	3.7431	0.83901	-0.628	0.143	-0.074	0.286
IEOR	289	1.25	5.00	3.7855	0.81798	-0.632	0.143	-0.241	0.286
IEOI	289	1.25	5.00	3.7630	0.84036	-0.504	0.143	-0.549	0.286
IEO	289	1.67	5.00	3.7638	0.62311	-0.800	0.143	0.655	0.286
OII	289	1.43	5.00	3.9086	0.83828	-0.869	0.143	0.023	0.286
OIO	289	1.43	5.00	3.8369	0.80051	-0.682	0.143	-0.286	0.286
OI	289	1.43	5.00	3.8727	0.69142	-0.909	0.143	0.822	0.286
Valid N (listwise)	289								

Table 5.
Pearson Correlation Coefficients.

Correlations				
		IP	**IEO**	**OI**
IP	Pearson Correlation	1		
IEO	Pearson Correlation	0.431**	1	
OI	Pearson Correlation	0.404**	0.334**	1

Note: **. Correlation is significant at the 0.01 level (2-tailed).

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Table 6.
Collinearity Statistics.

	Collinearity Statistics	
	Tolerance	**VIF**
IEO	0.849	1.178
OI	0.783	1.276

4.3. Regression and Mediation Analysis

The hypothesized associations were evaluated using a series of regression models and mediation tests conducted via PROCESS Macro (Model 4) with 5,000 bootstrap iterations, as recommended by [57].

First, a substantial and favorable relationship was identified between IEO and OI ($\beta = 0.334$, $p < 0.001$), suggesting that an entrepreneurial mindset promotes openness to external knowledge and inter-organizational collaboration. Second, OI positively influenced IP ($\beta = 0.404$, $p < 0.001$), highlighting its strategic role in enhancing global competitiveness [21]. Third, IEO retained a significant direct effect on IP even when OI was included as a mediator ($\beta = 0.334$, $p < 0.001$). OI also had a strong positive effect on IP ($\beta = 0.292$, $p < 0.001$), confirming a partial mediation pattern.

The mediation analysis revealed a statistically significant total effect of IEO on IP (effect = 0.593, SE = 0.0732, $p < 0.001$, 95% CI [0.449, 0.737]). After including OI as a mediator, the direct effect remained significant and robust (effect = 0.459, SE = 0.0741, $p < 0.001$, 95% CI [0.313, 0.604]). The indirect effect via OI was also significant (effect = 0.134, BootSE = 0.0366, 95% CI [0.072, 0.216]). The exclusion of zero from the indirect effect's confidence interval, along with the continued significance of the direct path, confirms a partial mediation effect (see Table 7).

These findings support Hypothesis H4 and indicate that OI serves as a key explanatory mechanism through which IEO enhances international performance in the CBEC context [58].

Table 7.
Bootstrap.

	path	**Effect**	**BootSE**	**BootLLCI**	**BootULCI**
total	X→Y	0.593	0.0732	0.449	0.7371
direct	X→Y	0.459	0.0741	0.3129	0.6045
indirect	X→M→Y	0.134	0.0366	0.0723	0.2155

Note: X = IEO (International Entrepreneurial Orientation); M = OI (Open Innovation); Y = IP (International Performance). Bootstrap sample size = 5,000; confidence interval = 95%. Indirect effect is significant because the CI does not include zero.

5. Discussion

5.1. Discussion of Key Findings

This study confirms that IEO significantly enhances the IP of Chinese SMEs in CBEC, supporting Hypothesis 1. Firms exhibiting strong innovativeness, proactiveness, and risk-taking are better equipped to seize digital opportunities, respond to global platform dynamics, and overcome internal constraints. These results align with Ringo, et al. [59] who found that entrepreneurial orientation drives export growth in emerging markets, and Matemane, et al. [60] who highlight that digital entrepreneurial orientation, coupled with strategic agility, improves international competitiveness. The findings emphasize that IEO facilitates accelerated rather than incremental internationalization in digital trade contexts.

Hypothesis 2 is supported, showing that IEO positively influences OI. Entrepreneurial firms are inclined toward collaboration across boundaries and external knowledge use—hallmarks of open innovation. Although direct studies on the IEO–OI link remain limited, Freixanet, et al. [61] offer empirical evidence that OI mediates the impact of IEO on innovation performance, indirectly suggesting a positive linkage. This finding supports the notion that SMEs with high IEO are more capable of leveraging external knowledge to foster innovation, particularly in fast-evolving CBEC environments.

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Further supporting Hypothesis 3, OI significantly enhances IP. In CBEC environments, SMEs that integrate external knowledge—such as user feedback, partner technologies, and platform insights—into their innovation processes can better tailor offerings, respond swiftly to market dynamics, and strengthen competitive positioning. These outcomes align with Yulianto and Supriono [62] who empirically demonstrated that inbound and outbound OI positively influences product, process, and service innovation among SMEs. Consistent with resource-based theory, this underline OI as a dynamic capability that enriches absorptive and adaptive capacities for international success.

In conclusion, Hypothesis 4 is validated, showing that OI partly mediates the relationship between IEO and IP. The IEO sets the strategic direction and aims for internationalization, while OI transforms this goal into adaptive innovation and competitive market responses. This highlights that having an entrepreneurial stance alone is insufficient for achieving outstanding global results. Supporting this, Freixanet, et al. [61] found that OI acts as a conduit, converting entrepreneurial orientation into improved innovation outcomes and emphasizing its mediating role in SME internationalization.

5.2. Theoretical and Practical Implications

The present study contributes theoretically to international entrepreneurship research by clarifying how IEO promotes SMEs' IP through OI. While prior studies have explored the link between entrepreneurial orientation and innovation-related outcomes [61] limited attention has been given to how IEO specifically drives OI in the context of CBEC. The findings of this study, when viewed through the lens of resource-based theory, position OI as a strategic capability that enables firms to convert entrepreneurial intent into tangible international outcomes. This perspective contributes to the existing body of literature on the subject by conceptualizing IEO as a dynamic input that interacts with digital ecosystems to facilitate the integration of external knowledge and adaptive learning.

Practically, the findings provide valuable guidance for SME managers engaged in CBEC, particularly those operating in export-oriented hubs such as Yiwu. First, the positive association between IEO and IP suggests that fostering innovativeness, proactiveness, and risk-taking is instrumental in identifying and capturing international opportunities. Second, in light of its moderating effect on the relationship between IEO and IP, SMEs are encouraged to strengthen their efforts in acquiring external knowledge and engaging in collaborative innovation. This may involve building data-driven insight pipelines, engaging suppliers in joint development efforts, or co-creating solutions with overseas customers. Especially in digitally dynamic environments, the strategic alignment of entrepreneurial posture with open innovation behaviors enhances agility and supports long-term international competitiveness [63].

5.3. Limitations and Future Research Directions

This study offers important insights regarding the roles of IEO and OI in shaping the international performance of Chinese CBEC SMEs. However, it is imperative to acknowledge several limitations inherent to the study. First, the sample is limited to SMEs based in Yiwu—a leading CBEC hub—without including large firms as a point of comparison. Given that firm size can significantly influence internationalization patterns and innovation strategies [64] future research could benefit from a comparative design that examines size-based heterogeneity. Second, the analysis does not consider key contextual factors—such as cultural distance, institutional settings, and digital adoption levels—that may also influence international performance. These factors have been shown to shape the success of cross-border strategies and innovation performance [65] and should be integrated into future empirical models. Third, the use of cross-sectional data restricts causal interpretation and precludes the examination of longitudinal effects—highlighting the need for future studies employing panel or longitudinal designs. Given that entrepreneurial orientation and innovation behaviors may shift throughout the internationalization process, longitudinal research designs are advisable for capturing temporal dynamics and providing a more rigorous assessment of causal pathways [43]. Limitations notwithstanding, the study advances understanding of the strategic role entrepreneurial and innovation

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capabilities play in enabling SMEs from emerging economies to thrive amid digital transformation and global competition.

6. Conclusion

This study investigates how IEO impacts the IP of Chinese SMEs within CBEC, with OI acting as a mediating factor. The findings suggest that entrepreneurial orientation meaningfully shapes firms' international outcomes and concurrently encourages greater engagement in open innovation efforts. These results underscore the role of OI in facilitating international outcomes and mediating, to some extent, the influence of IEO on firms' cross-border achievements. These results underscore that an entrepreneurial stance alone is insufficient for achieving global competitiveness in rapidly evolving digital markets. SMEs actively participate in open innovation by acquiring external information, working across boundaries, and incorporating varied inputs into their strategy processes to convert intent into international success. This study highlights that the interaction between IEO and OI enables Chinese SMEs to overcome internal constraints and enhance their global competitiveness by focusing on CBEC.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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