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The Effect of Cross-Border E-Commerce Adoption on the Internationalization Performance of MSMEs: The Mediation Role of International Market Access

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Abstract

Micro, small, and medium-sized enterprises increasingly use cross-border e-commerce to overcome foreign market entry barriers, yet its performance mechanism remains underexplored. This study examines whether international market access mediates the effect of cross-border e-commerce adoption on internationalization performance. A quantitative explanatory survey was conducted with 170 micro, small, and medium-sized enterprises engaged in digitally supported cross-border business activities. The data were analyzed using partial least squares structural equation modeling through measurement and structural model assessment. The results show that cross-border e-commerce adoption significantly improves internationalization performance and strongly enhances international market access. International market access also significantly improves internationalization performance and partially mediates the relationship between cross-border e-commerce adoption and internationalization performance. The model explains substantial variance in internationalization performance. These findings imply that digital adoption generates stronger international outcomes when firms transform platform use into practical access to foreign customers, market information, and international buyers.

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INTRODUCTION

Micro, small, and medium-sized enterprises (MSMEs) play a pivotal role in employment generation, innovation, and inclusive economic growth, yet their participation in international markets remains disproportionately limited compared with larger firms. The internationalization literature consistently shows that MSMEs face substantial constraints when attempting to expand beyond domestic boundaries, including limited managerial resources, insufficient market knowledge, weak international networks, and capability gaps that reduce their ability to identify and exploit foreign opportunities (Chandra et al., 2020; Gupta & Chauhan, 2021). These barriers are especially salient in increasingly digital and competitive environments, where foreign market participation requires not only conventional export capabilities but also the ability to navigate digital infrastructures and platform-based business ecosystems. As a result, understanding how MSMEs can overcome internationalization constraints has become a central concern in marketing and international business research.

Within this context, cross-border e-commerce (CBEC) has emerged as an important alternative pathway for MSMEs seeking to internationalize without the high commitment associated with traditional entry modes. Prior studies describe CBEC as a digitally enabled foreign market entry mode that allows firms to reach foreign customers through online platforms, digital marketplaces, and electronically coordinated transactions, thereby reducing spatial, informational, and transactional frictions (Cassia & Magno, 2022; Jin & Hurd, 2018). Research further indicates that digitalization can facilitate SMEs' participation in trade by connecting them to broader pools of customers and suppliers and by reducing dependence on physical presence in overseas markets (Añón Higón & Bonvin, 2024). From a strategic standpoint, CBEC is attractive for MSMEs because it offers flexibility, lower entry costs, and enhanced control over international commercial activities. However, the existence of such digital opportunities does not automatically guarantee improved international outcomes, which raises an important theoretical and managerial question regarding how CBEC adoption translates into internationalization performance.

The need to address this question is reinforced by recent research showing that digital transformation has both enabling and constraining implications for firm internationalization. A systematic review by Feliciano-Cestero et al., (2023) concludes

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that digital transformation can promote firms' international expansion, but its effect depends on organizational, technological, and contextual conditions. Similarly, Cumming et al., (2023) argue that the role of e-commerce in international business cannot be understood apart from policy and institutional environments, while Temouri et al., (2025) show that cross-country differences in legal systems, institutional development, and policy support shape the internationalization of e-commerce-oriented SMEs. In addition, (Zhang et al., 2025) suggest that digital platforms provide critical external resources for SME internationalization, but also expose smaller firms to new forms of competition and dependency. These studies imply that CBEC adoption should not be treated as a self-sufficient determinant of success; rather, its performance implications are likely to depend on the mechanisms through which digital adoption improves firms' ability to engage foreign markets.

One mechanism that appears theoretically promising but remains underdeveloped in the literature is international market access. For MSMEs, the value of CBEC lies not only in digitizing transactions, but also in enabling practical access to foreign customers, overseas demand, international business information, and cross-border exchange infrastructures. Existing evidence supports this perspective. Añón Higón & Bonvin, (2024) show that digitalization improves SMEs' access to foreign markets by facilitating connections with customers and suppliers, while (Chen et al., 2025) find that cross-border e-commerce platforms enable firms, especially smaller ones, to gain global market insights without physical entry into foreign countries. In related work, Tolstoy et al., (2022) argue that successful cross-border e-commerce among SMEs depends on the creation of market opportunities through digitally mediated interactions, whereas (Gong et al., 2024) emphasize that digital platforms expand internationalization by improving firms' access to platform-based ecosystems, information, and foreign contacts. Taken together, these studies suggest that international market access may function as a critical bridge between CBEC adoption and internationalization performance.

Despite these advances, the current state of the art still reveals a significant research gap. Much of the existing literature has focused either on the direct relationship between digital or export capabilities and international performance, or on adjacent mediating mechanisms such as foreign market knowledge acquisition, technological innovation, and network capability. Cassia & Magno, (2022) demonstrate that export capabilities are associated with performance in CBEC settings, while Cassia & Magno, (2022b) show that the performance effect of data-driven platform use is mediated by foreign market knowledge acquisition. Bagheri et al. (2019) identify technological

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innovation as a mediator between internationalization orientation and international performance, and Cenamor et al., (2019) find that digital platform capability contributes to firm performance through network capability. Although these studies are valuable, they leave limited room for understanding international market access as a broader integrative mediating construct that captures not only knowledge acquisition or networking, but also the actual ability to reach, connect with, and respond to foreign market opportunities. This unresolved gap forms the basis of the present study's novelty.

Accordingly, this study advances the argument that CBEC adoption can improve the internationalization performance of MSMEs both directly and indirectly through international market access. The direct effect is theoretically plausible because digital entry tools may allow firms to increase cross-border sales efficiency, expand foreign customer reach, and support market responsiveness (Cassia & Magno, 2022a; Tolstoy et al., 2022). At the same time, the indirect effect is equally important because CBEC may first enhance firms' access to foreign demand, market intelligence, and overseas business connections, which in turn improve international outcomes (Chen et al., 2025; Gong et al., 2024). On this basis, the study is grounded in the expectation that CBEC adoption is positively associated with internationalization performance, that CBEC adoption enhances international market access, and that international market access positively mediates the relationship between CBEC adoption and internationalization performance.

The scope of this study is therefore deliberately focused on MSMEs engaged in digitally enabled cross-border business activities. Rather than examining digitalization in a broad and generic sense, the study concentrates specifically on CBEC adoption as a foreign market entry mechanism and on internationalization performance as the focal outcome. This scope is important because recent reviews call for more precise, mechanism-based explanations of how digital platforms influence SME internationalization rather than treating digital transformation as a monolithic phenomenon (Bargoni et al., 2024; Da Rocha et al., 2024). By positioning international market access as the mediator, the study also responds to calls for more process-oriented and market-facing explanations of SME internationalization through digital platforms (Gong et al., 2024). In doing so, the study extends prior work by clarifying the pathway through which digital adoption can be converted into international business results.

The urgency of this research is both theoretical and practical. Theoretically, despite the rapid growth of literature on SME digitalization and internationalization, important explanatory gaps remain regarding how digitally enabled market participation produces

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performance outcomes for resource-constrained firms (Bargoni et al., 2024; Feliciano-Cestero et al., 2023). Practically, MSMEs are increasingly encouraged to internationalize through digital channels, yet many continue to struggle to convert digital presence into meaningful foreign market success. For managers, a better understanding of the mediating role of international market access may help distinguish between mere platform participation and strategically effective international engagement. For policymakers, the findings may provide insights into how digital trade support, institutional infrastructure, and market access facilitation can strengthen MSME international competitiveness (Cumming et al., 2023; Temouri et al., 2025). Therefore, this study seeks to examine the effect of CBEC adoption on the internationalization performance of MSMEs and to test the mediating role of international market access, thereby offering a more precise explanation of how and why digital internationalization succeeds for smaller firms.

THEORETICAL FOUNDATION

This study is anchored in the Resource-Based View (RBV), which argues that firms achieve superior performance when they possess and effectively deploy valuable, rare, and difficult-to-imitate resources and capabilities. In the context of MSME internationalization, cross-border e-commerce (CBEC) adoption can be understood as a strategic digital capability that enables firms to overcome resource constraints, reduce market-entry barriers, and access foreign opportunities more efficiently. However, RBV also suggests that resources do not generate performance automatically; their value depends on how they are transformed into market outcomes. In this study, international market access is positioned as the mechanism through which CBEC adoption creates internationalization performance, because digital capability becomes strategically meaningful only when it improves firms' ability to reach foreign customers, obtain market information, and participate in cross-border exchanges (Cassia & Magno, 2022a; Cenamor et al., 2019; Gong et al., 2024)

Prior studies indicate that CBEC serves as a digitally enabled foreign market entry mode that helps MSMEs interact with foreign buyers, coordinate international transactions, and expand beyond domestic markets with relatively lower costs and greater flexibility than traditional entry modes. Empirical evidence shows that digital and export-related capabilities are positively associated with international performance among smaller firms, suggesting that CBEC adoption can strengthen foreign sales activities and improve international business outcomes (Cassia & Magno, 2022a; Tolstoy

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et al., 2022; Zhang et al., 2025). Therefore, CBEC adoption is expected to directly enhance the internationalization performance of MSMEs.

H1: Cross-border e-commerce adoption has a positive effect on the internationalization performance of MSMEs.

Beyond its direct effect, CBEC adoption is also expected to improve international market access. Through digital platforms, online marketplaces, and cross-border transaction systems, MSMEs can increase their visibility in foreign markets, connect with overseas customers and partners, and obtain timely information about international demand and market conditions. Existing studies show that digitalization facilitates SMEs' access to larger pools of customers and suppliers, while CBEC platforms help smaller firms gain international market insights without requiring physical presence abroad (Añón Higón & Bonvin, 2024; Chen et al., 2025; Jin & Hurd, 2018). In turn, greater international market access should improve internationalization performance because firms with stronger access to foreign demand, information, and exchange opportunities are better positioned to identify opportunities, respond to customer needs, and achieve more favorable outcomes in overseas markets (Cenamor et al., 2019; Gong et al., 2024; Tolstoy et al., 2022). Accordingly, the following hypotheses are proposed:

H2: Cross-border e-commerce adoption has a positive effect on international market access.

H3: International market access has a positive effect on the internationalization performance of MSMEs.

The mediating logic of this study follows the mechanism-based perspective in recent international business research, which emphasizes that digital adoption affects firm outcomes through intermediate market-facing and capability-related processes rather than through technology use alone. Prior research has identified foreign market knowledge acquisition, innovation, and network capability as mediating channels linking digital capability to international outcomes (Bagheri et al., 2019; Cassia & Magno, 2022b; Cenamor et al., 2019). Extending this literature, the present study proposes that international market access is a broader and more integrative mediator, because it captures not only knowledge acquisition and relationships, but also the firm's practical ability to reach, connect with, and respond to foreign market opportunities. Thus, CBEC adoption is expected to improve internationalization performance indirectly by enhancing international market access.

H4: International market access positively mediates the relationship between cross-border e-commerce adoption and the internationalization performance of MSMEs.

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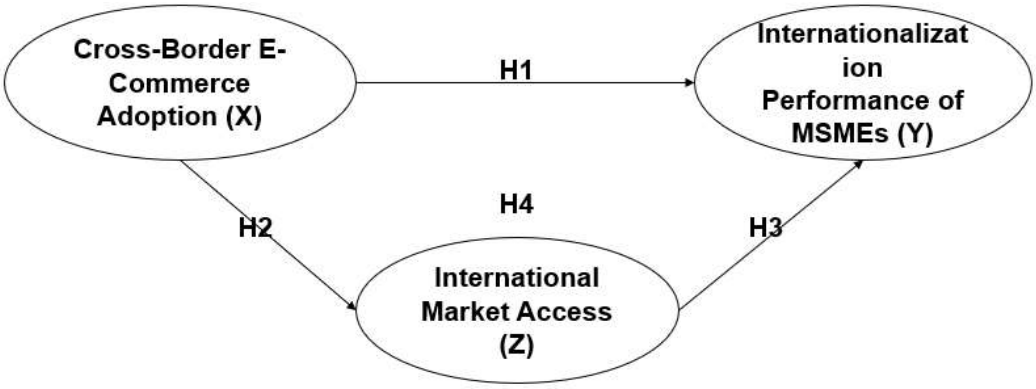


Figure 1. Conceptual Framework
Source: Adopted and modified from Research Conceptual Model, 2025

Based on these arguments, the conceptual framework of this study is concise and linear: CBEC adoption is modeled as the independent variable, international market access as the mediating variable, and internationalization performance as the dependent variable. The framework includes both a direct path from CBEC adoption to internationalization performance and an indirect path through international market access. In this way, the model explains not only whether CBEC adoption matters for MSMEs, but also how digital capability is translated into superior international outcomes.

RESEARCH METHODOLOGY

This study employed a quantitative, explanatory, cross-sectional design to examine the effect of cross-border e-commerce (CBEC) adoption on the internationalization performance of MSMEs, with international market access as a mediating variable. A survey approach was used because the study aimed to test relationships among latent constructs measured at one point in time. The research was conducted in [insert location] during [insert period]. The unit of analysis was the firm, while respondents were owners or managers with sufficient knowledge of the firm's digital and international business activities. Given the prediction-oriented objective of the study and the inclusion of mediation effects, PLS-SEM was considered appropriate (J. Hair & Alamer, 2022; J. F. Hair et al., 2021).

The population comprised MSMEs engaged in digitally supported cross-border business activities. Firms were included if they met three criteria: they were classified as MSMEs under the applicable definition, used digital channels for foreign market activities,

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and had recent experience with international transactions or overseas customer inquiries. Because a complete sampling frame was not available, the study applied purposive sampling. The final sample consisted of 170 MSMEs, which was considered adequate for PLS-SEM given the model complexity and the study's analytical purpose (J. Hair & Alamer, 2022).

Data were collected using a structured questionnaire with closed-ended items. The instrument consisted of four sections: respondent and firm profile, CBEC adoption, international market access, and internationalization performance. All substantive items were measured using a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree. The indicators were adapted from prior studies and adjusted to the context of MSMEs operating in cross-border e-commerce. CBEC adoption was measured through items related to digital selling, online promotion, payment systems, order handling, and platform use. International market access reflected the firm's ability to reach foreign customers, obtain overseas market information, and connect with international partners. Internationalization performance was measured through perceived foreign sales growth, market expansion, competitive position, and overall international business success (Cassia & Magno, 2022a; Cenamor et al., 2019; Chen et al., 2025; Tolstoy et al., 2022).

Before the main survey, the questionnaire should be reviewed by experts and pilot-tested to improve clarity and content validity. If the survey is administered in a language other than English, translation and back-translation procedures should be applied. To reduce common method bias, anonymity should be assured and the questionnaire should use simple, neutral wording (Brislin, 1970; Podsakoff et al., 2003).

The research procedure consisted of four stages. First, measurement items were identified from relevant literature and adapted to the study context. Second, the questionnaire was reviewed and pilot-tested. Third, the final survey was distributed to eligible MSMEs through the final questionnaire was administered to eligible MSMEs through a structured survey conducted between January and March 2026. Fourth, returned questionnaires were screened for completeness and consistency before analysis. Only one valid response was accepted from each firm, and incomplete or careless responses were excluded.

The data were analyzed using PLS-SEM in two stages: measurement model evaluation and structural model evaluation. For the measurement model, reflective constructs were assessed using outer loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and heterotrait-monotrait ratio (HTMT). Commonly

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accepted thresholds were applied, including loadings above 0.70, composite reliability above 0.70, AVE above 0.50, and HTMT below 0.85 or 0.90 (J. Hair & Alamer, 2022).

For the structural model, the analysis examined collinearity, path coefficients, coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). Hypotheses were tested using bootstrapping with 5,000 resamples. The mediating role of international market access was assessed through the significance of the indirect effect of CBEC adoption on internationalization performance. A significant indirect effect indicated mediation, while the significance of the direct effect was used to distinguish between partial and full mediation (J. Hair & Alamer, 2022; J. F. Hair et al., 2021).

Table 1. Operational Definitions and Measurement Indicators of the Study Variables

Variable	Operational definition	Measurement indicators	Main source(s) for adaptation
Cross-Border E-Commerce Adoption	The extent to which an MSME uses digital and platform-based tools to support and conduct cross-border commercial activities.	1. The firm uses online platforms or marketplaces to reach foreign customers.	(Cassia & Magno, 2022b, 2022a)
		2. The firm uses digital channels to promote products in overseas markets.	
		3. The firm uses online payment systems for cross-border transactions.	
		4. The firm uses digital tools to manage foreign customer inquiries and orders.	
		5. The firm uses platform data or analytics to support international selling decisions.	
International Market Access	The degree to which an MSME can reach, connect with, and respond to foreign market	1. The firm can more easily reach customers in foreign markets. 2. The firm has greater visibility in international markets. 3. The firm can identify foreign market opportunities more quickly.	(Chen et al., 2025; Gong et al., 2024; Tolstoy et al., 2022)

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	opportunities through digitally enabled channels.	4. The firm can obtain useful information about overseas customer needs and demand. 5. The firm can connect more effectively with international buyers or partners.	
Internationalization Performance	The extent to which an MSME achieves favorable outcomes from its international business activities.	1. The firm's foreign sales have improved. 2. The firm has expanded its reach to overseas customers or markets. 3. The firm's international business performance meets its expectations. 4. The firm's competitive position in foreign markets has improved. 5. Overall, the firm is satisfied with its internationalization results.	(Cassia & Magno, 2022a; Cenamor et al., 2019; Tolstoy et al., 2022)

Source: Secondary data processed 2026

RESULT AND DISCUSSION

Table 2. Demographic Profile of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	92	54.1
	Female	78	45.9
Age	25–34 years	56	32.9
	35–44 years	64	37.6
	45 years and above	50	29.4
Position	Owner	71	41.8
	Owner-manager	68	40.0
	Manager/Staff	31	18.2
Business Age	< 3 years	38	22.4
	3–5 years	52	30.6
	> 5 years	80	47.1

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Firm Size	Micro	84	49.4
	Small	61	35.9
	Medium	25	14.7
Primary Digital Channel	Marketplace platform	73	42.9
	Social media commerce	48	28.2
	Website/webstore	19	11.2
	Multiple channels	30	17.6
Cross-Border Experience	< 1 year	35	20.6
	1–3 years	74	43.5
	> 3 years	61	35.9

Source: Data processed 2026

The respondent profile indicates that the sample was slightly dominated by male respondents (54.1%), while the largest age group was 35–44 years (37.6%). Most respondents were business owners or owner-managers (81.8%), suggesting that the data were obtained from individuals with substantial decision-making authority. In terms of firm characteristics, most businesses had operated for more than five years (47.1%) and were categorized as micro enterprises (49.4%). Marketplace platforms were the most widely used digital channel (42.9%), and most firms had between one and three years of cross-border business experience (43.5%).

Table 3. Descriptive Statistics of the Study Variables

Variable	Code	No. of Indicators	N	Minimum	Maximum	Mean	Std. Deviation
Cross-Border E-Commerce Adoption	X	5	170	1.867	5.000	4.007	0.731
International Market Access	Z	5	170	3.000	5.000	4.315	0.599
Internationalization Performance	Y	5	170	2.533	5.000	4.251	0.561

Source: Primary data processed, 2026.

The descriptive statistics show that all study variables obtained relatively high mean scores. International market access recorded the highest mean value (M = 4.315, SD = 0.599), indicating that MSMEs generally perceived digital channels as helpful in improving

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their ability to reach foreign customers, obtain overseas market information, and connect with international buyers or partners. Internationalization performance also showed a high mean score (M = 4.251, SD = 0.561), suggesting that respondents tended to report favorable outcomes from their international business activities. Meanwhile, cross-border e-commerce adoption had a mean score of 4.007 with the highest standard deviation (SD = 0.731), indicating that although CBEC adoption was generally high, the level of adoption varied more widely among MSMEs compared with the other variables. Overall, these results provide an initial indication that MSMEs in the sample have relatively strong digital adoption, market access, and internationalization performance, which supports further testing of the proposed structural model.

Table 4. Outer Loadings, Composite Reliability, and Convergent Validity

Construct	Indicator	Outer Loading	Cronbach's Alpha	rho_A	Composite Reliability	AVE	Decision
Cross-Border E-Commerce Adoption	X1.1	0.917	0.943	0.946	0.956	0.814	Valid
	X1.2	0.875					Valid
	X1.3	0.923					Valid
	X1.4	0.866					Valid
	X1.5	0.928					Valid
International Market Access	Z2.1	0.865	0.932	0.934	0.949	0.787	Valid
	Z2.2	0.878					Valid
	Z2.3	0.912					Valid
	Z2.4	0.929					Valid
	Z2.5	0.850					Valid
Internationalization Performance	Y1.1	0.879	0.918	0.920	0.939	0.754	Valid
	Y1.2	0.832					Valid
	Y1.3	0.899					Valid
	Y1.4	0.879					Valid
	Y1.5	0.852					Valid

Source: Primary data processed, 2026.

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The measurement model results indicate that all indicators have outer loading values above the recommended threshold of 0.70. The outer loadings range from 0.866 to 0.928 for Cross-Border E-Commerce Adoption, from 0.850 to 0.929 for International Market Access, and from 0.832 to 0.899 for Internationalization Performance. These findings show that each indicator adequately represents its respective latent construct. The reliability results also demonstrate strong internal consistency. Cronbach's alpha values range from 0.918 to 0.943, while composite reliability values range from 0.939 to 0.956, indicating that all constructs meet the reliability criteria. In addition, the AVE values are above 0.50, namely 0.814 for Cross-Border E-Commerce Adoption, 0.787 for International Market Access, and 0.754 for Internationalization Performance. Therefore, the constructs satisfy convergent validity, and no indicator needs to be removed from the measurement model.

Table 5. Discriminant Validity Assessment Using HTMT

Construct	Cross-Border E-Commerce Adoption	International Market Access	Internationalization Performance
Cross-Border E-Commerce Adoption	-	-	-
International Market Access	0.709	-	-
Internationalization Performance	0.753	0.886	-

Source: SmartPLS output, data processed 2026.

The HTMT results indicate that the discriminant validity of the constructs was generally established. The HTMT value between Cross-Border E-Commerce Adoption and International Market Access was 0.709, while the value between Cross-Border E-Commerce Adoption and Internationalization Performance was 0.753. Both values are below the recommended threshold of 0.85 and 0.90, indicating that these constructs are empirically distinct. The HTMT value between International Market Access and Internationalization Performance was 0.886. Although this value is relatively high, it remains below the 0.90 threshold commonly accepted in PLS-SEM studies. This result suggests that International Market Access and Internationalization Performance are

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closely related but still sufficiently distinct constructs. Therefore, the measurement model satisfies the discriminant validity requirement and can be continued to the structural model evaluation.

Table 6. Discriminant Validity Using Fornell–Larcker Criterion

Construct	Cross-Border E-Commerce Adoption	International Market Access	Internationalization Performance
Cross-Border E-Commerce Adoption	0.902		
International Market Access	0.667	0.887	
Internationalization Performance	0.703	0.822	0.868

Source**:** SmartPLS output, data processed 2026.

The Fornell–Larcker criterion was used to further assess discriminant validity among the three latent constructs. As shown in Table 6, the square root of AVE for Cross-Border E-Commerce Adoption was 0.902, which was higher than its correlations with International Market Access (0.667) and Internationalization Performance (0.703). Similarly, the square root of AVE for International Market Access was 0.887, exceeding its correlations with Cross-Border E-Commerce Adoption (0.667) and Internationalization Performance (0.822). The square root of AVE for Internationalization Performance was also adequate at 0.868, which was higher than its correlations with the other constructs. These results indicate that each construct shares more variance with its own indicators than with other constructs in the model. Therefore, the Fornell–Larcker results confirm that the measurement model satisfies the discriminant validity requirement and is suitable for further structural model assessment.

Table 7. Collinearity Assessment of Predictor Constructs

Endogenous Construct	Predictor Construct	\VIF	Decision
International Market Access	Cross-Border E-Commerce Adoption	1.000	No collinearity problem

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Internationalization Performance	Cross-Border E-Commerce Adoption	1.802	No collinearity problem
Internationalization Performance	International Market Access	1.802	No collinearity problem

Source: SmartPLS output, data processed 2026.

The collinearity assessment was conducted to ensure that the predictor constructs in the structural model were not highly correlated with one another. As shown in Table 7, the VIF value for the effect of Cross-Border E-Commerce Adoption on International Market Access was 1.000. This value is expected because International Market Access has only one predictor in the model.For Internationalization Performance, the VIF values of Cross-Border E-Commerce Adoption and International Market Access were both 1.802. These values are far below the commonly accepted threshold of 5.00, indicating that multicollinearity is not a serious concern. Therefore, the structural model can be considered stable for further hypothesis testing, including the assessment of direct and indirect effects.

Table 8. Coefficient of Determination, Effect Size, and Predictive Relevance

Endogenous Construct	Predictor Construct	R^2	R^2 Adjusted	f^2	Q^2	Interpretation
International Market Access	Cross-Border E-Commerce Adoption	0.445	0.442	0.802	0.346	Moderate explanatory power, large effect size, predictive relevance established
Internationalization Performance	Cross-Border E-Commerce Adoption	0.718	0.715	0.152	0.531	Substantial explanatory power, medium effect size, predictive relevance established

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Internationalization Performance	International Market Access	0.718	0.715	0.795	0.531	Substantial explanatory power, large effect size, predictive relevance established

Source: SmartPLS algorithm and blindfolding output, data processed 2026.

The coefficient of determination results show that Cross-Border E-Commerce Adoption explains 44.5% of the variance in International Market Access, as indicated by an R^2 value of 0.445. This suggests that CBEC adoption has moderate explanatory power in predicting MSMEs' access to international markets. The f^2 value of 0.802 further indicates that CBEC adoption has a large substantive effect on International Market Access.

For Internationalization Performance, the R^2 value is 0.718, meaning that Cross-Border E-Commerce Adoption and International Market Access jointly explain 71.8% of the variance in MSMEs' internationalization performance. This reflects substantial explanatory power. The effect size results show that Cross-Border E-Commerce Adoption has a medium effect on Internationalization Performance ($f^2 = 0.152$), while International Market Access has a large effect ($f^2 = 0.795$). These findings indicate that International Market Access is the more dominant predictor of Internationalization Performance in the structural model.

The predictive relevance assessment also supports the model's predictive capability. The Q^2 value for International Market Access is 0.346, while the Q^2 value for Internationalization Performance is 0.531. Since both values are greater than zero, the model demonstrates predictive relevance for both endogenous constructs. Overall, these results confirm that the structural model has adequate explanatory and predictive quality, with International Market Access playing a particularly important role in explaining MSMEs' internationalization performance.

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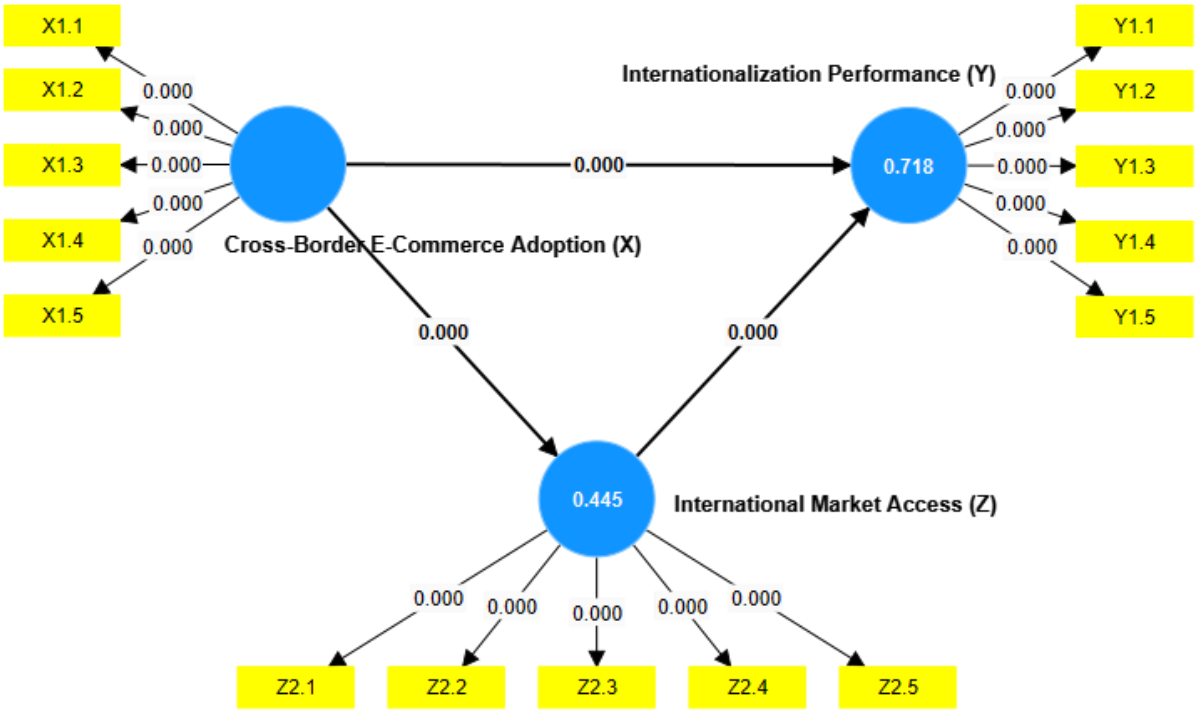


Figure 2. Structural Model Results

Table 9. Direct Effect and Spesifik Indirect Effect Hypothesis

Relationship	Effect Type	Original Sample (O)	Sample Mean (M)	STDEV	T Statistics	P Values	Decision
Cross-Border E-Commerce Adoption → Internationalization Performance	Direct effect	0.278	0.276	0.067	4.124	<0.001	Supported
Cross-Border E-Commerce Adoption → International Market Access	Direct effect	0.667	0.668	0.054	12.320	<0.001	Supported
International Market Access →	Direct effect	0.636	0.639	0.065	9.731	<0.001	Supported

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Internationalization Performance							
Cross-Border E-Commerce Adoption → International Market Access → Internationalization Performance	Specific indirect effect	0.424	0.427	0.057	7.453	<0.001	Supported

Source: SmartPLS bootstrapping output, data processed 2026.

The bootstrapping results indicate that all proposed direct relationships are statistically significant. Cross-Border E-Commerce Adoption has a positive and significant effect on Internationalization Performance (β = 0.278, t = 4.124, p < 0.001), supporting H1. This result suggests that MSMEs with stronger adoption of cross-border e-commerce tend to achieve better internationalization outcomes. Cross-Border E-Commerce Adoption also has a strong positive effect on International Market Access (β = 0.667, t = 12.320, p < 0.001), supporting H2. This finding indicates that the use of digital platforms, online promotion, digital payment systems, and platform-based selling tools improves MSMEs' ability to reach foreign customers, identify overseas opportunities, and connect with international buyers. Furthermore, International Market Access positively affects Internationalization Performance (β = 0.636, t = 9.731, p < 0.001), supporting H3.

The specific indirect effect is also significant (β = 0.424, t = 7.453, p < 0.001), with a confidence interval ranging from 0.321 to 0.542. Because the confidence interval does not include zero, H4 is supported. This means that International Market Access significantly mediates the relationship between Cross-Border E-Commerce Adoption and Internationalization Performance. Since both the direct effect and indirect effect are significant and positive, the mediation can be interpreted as partial complementary mediation. In other words, CBEC adoption improves internationalization performance directly, but its effect becomes stronger when MSMEs are able to convert digital adoption into broader access to international markets.

The summary of hypothesis testing shows that all proposed hypotheses are supported. The direct effect of Cross-Border E-Commerce Adoption on Internationalization Performance is positive and significant, indicating that MSMEs that

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adopt cross-border e-commerce more intensively tend to achieve better international business outcomes. This supports H1.

H2 is also supported, as Cross-Border E-Commerce Adoption has a strong positive effect on International Market Access. This finding confirms that digital platforms, online promotion, digital payment systems, and platform-based transaction tools help MSMEs reach foreign customers and identify overseas market opportunities more effectively. Furthermore, H3 is supported because International Market Access has a positive and significant effect on Internationalization Performance.

The mediation hypothesis is also supported. The specific indirect effect of Cross-Border E-Commerce Adoption on Internationalization Performance through International Market Access is significant. Since both the direct and indirect effects are significant, the mediation can be classified as partial complementary mediation. This means that CBEC adoption contributes to internationalization performance directly, while also strengthening performance indirectly by improving MSMEs' access to international markets.

The findings of this study provide empirical support for the proposed model linking cross-border e-commerce adoption, international market access, and internationalization performance among MSMEs. Overall, the results confirm that cross-border e-commerce adoption does not only function as a digital transaction mechanism, but also as a strategic capability that enables smaller firms to overcome resource limitations and improve their international business outcomes. This finding is consistent with the Resource-Based View, which argues that firm resources and capabilities create performance advantages when they are effectively deployed to access market opportunities. In the context of this study, CBEC adoption becomes valuable because it helps MSMEs reach foreign customers, manage cross-border interactions, and transform digital participation into international performance outcomes.

First, H1 is supported, indicating that cross-border e-commerce adoption has a positive and significant effect on internationalization performance. The result shows that MSMEs with stronger adoption of online platforms, digital promotion, online payment systems, and platform-based selling tools tend to achieve better international business performance. This suggests that CBEC adoption helps MSMEs reduce traditional barriers to internationalization, such as limited physical presence, high market entry costs, and restricted access to overseas customers. Through digital channels, MSMEs can promote products internationally, handle foreign customer inquiries, and coordinate transactions more efficiently. This finding supports previous studies which argue that cross-border e-commerce can serve as an effective foreign market entry mode for SMEs and can

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strengthen export or international performance when firms possess adequate digital and export capabilities (Cassia & Magno, 2022a; Tolstoy et al., 2022).

Second, H2 is supported, showing that cross-border e-commerce adoption has a strong positive effect on international market access. This is one of the most important findings of the study because it demonstrates that digital adoption contributes directly to MSMEs' ability to reach and understand foreign markets. The path coefficient for this relationship is relatively strong, suggesting that CBEC adoption plays a substantial role in expanding MSMEs' access to foreign customers, international buyers, overseas market information, and cross-border business opportunities. This result confirms that digital platforms are not merely sales channels, but also market access infrastructures. For MSMEs, the ability to use marketplace platforms, digital analytics, online communication tools, and electronic transaction systems can reduce information asymmetry and improve visibility in foreign markets. This finding is in line with Chen et al. (2025), Gong et al. (2024), and Añón Higón and Bonvin (2024), who emphasized that digital platforms and digitalization help smaller firms gain foreign market insights and access broader customer and supplier networks.

Third, H3 is supported, confirming that international market access has a positive and significant effect on internationalization performance. This result indicates that MSMEs are more likely to achieve favorable international outcomes when they are able to reach foreign customers, identify overseas opportunities, and obtain relevant information about international demand. In practical terms, internationalization performance is not determined only by the availability of digital tools, but also by whether those tools allow firms to develop meaningful access to foreign markets. MSMEs that can understand customer needs, connect with international partners, and respond quickly to overseas market opportunities are better positioned to improve foreign sales, expand market reach, and strengthen their competitive position. This finding supports prior literature which highlights the importance of market knowledge, networks, and platform-based access in improving SME internationalization outcomes (Cenamor et al., 2019; Gong et al., 2024; Tolstoy et al., 2022).

Fourth, H4 is supported, indicating that international market access significantly mediates the relationship between cross-border e-commerce adoption and internationalization performance. The significant indirect effect shows that CBEC adoption improves internationalization performance partly because it enhances MSMEs' access to international markets. Since the direct effect of CBEC adoption on internationalization performance remains significant, the mediation can be interpreted as

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partial complementary mediation. This means that CBEC adoption contributes to international performance through two pathways. The first pathway is direct, where digital adoption improves efficiency, visibility, and transaction capability. The second pathway is indirect, where digital adoption first strengthens international market access, which then improves internationalization performance.

This mediation finding provides an important theoretical contribution. It shows that the relationship between digital adoption and international performance should not be understood as a simple direct relationship. Rather, digital adoption becomes more valuable when it is converted into market-facing capabilities. In this study, international market access acts as the key mechanism that explains how CBEC adoption produces stronger internationalization outcomes. This extends previous research that has examined mediating mechanisms such as foreign market knowledge acquisition, innovation, and network capability (Bagheri et al., 2019; Cassia & Magno, 2022b; Cenamor et al., 2019). Unlike those more specific mechanisms, international market access offers a broader explanation because it captures the firm's ability to reach customers, obtain market information, identify opportunities, and connect with international buyers or partners.

From a managerial perspective, the findings imply that MSMEs should not treat CBEC adoption as a technical activity only. Simply joining digital platforms or using online payment systems may not be sufficient to improve international performance. MSMEs need to use CBEC strategically to build visibility, collect market intelligence, communicate with foreign customers, and develop international buyer relationships. Therefore, managers should strengthen digital platform capability, improve product presentation for foreign markets, use data from online platforms, and actively manage customer interaction across borders. The stronger the ability of MSMEs to translate digital adoption into real international market access, the higher their potential to improve internationalization performance.

From a policy perspective, the findings suggest that support for MSME internationalization should go beyond encouraging digital platform adoption. Policymakers and business support institutions need to facilitate access to international market information, digital export training, cross-border payment infrastructure, logistics support, and international buyer networks. Such support can help MSMEs move from basic digital participation toward more effective digital internationalization. Thus, the study confirms that CBEC adoption is important, but its strategic value becomes stronger when it expands MSMEs' practical access to foreign markets.

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CONCLUSION

This study examined the effect of cross-border e-commerce adoption on the internationalization performance of MSMEs and the mediating role of international market access. The findings show that all proposed hypotheses are supported. Cross-border e-commerce adoption has a positive and significant effect on internationalization performance, indicating that MSMEs that use digital platforms, online promotion, online payment systems, and platform-based selling tools are more likely to achieve better foreign market outcomes. The results also show that cross-border e-commerce adoption strongly enhances international market access, while international market access significantly improves internationalization performance. This confirms that digital adoption creates stronger value when MSMEs can transform it into practical access to foreign customers, overseas market information, international opportunities, and buyer networks.

The main contribution of this study is the evidence that international market access partially mediates the relationship between cross-border e-commerce adoption and internationalization performance. This finding extends the literature on MSME internationalization and digital internationalization by showing that digital capability produces performance benefits through market-facing capability. Practically, MSMEs should use cross-border e-commerce not only as a sales channel, but also as a strategic tool to improve foreign market visibility, gather market intelligence, and build international customer relationships. Policymakers and business support institutions should strengthen digital export training, market information access, payment infrastructure, logistics support, and international buyer facilitation. Future research may test this model in different industries, countries, or longitudinal settings, and may include variables such as digital capability, export readiness, institutional support, or platform dependency.

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