“Export performance of Vietnamese manufacturing SMEs: A PLS-SEM test of resource-based determinants, absorptive capacity, and international competition”

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EXPORT PERFORMANCE OF VIETNAMESE MANUFACTURING SMES: A PLS-SEM TEST OF RESOURCE-BASED DETERMINANTS, ABSORPTIVE CAPACITY, AND INTERNATIONAL COMPETITION

Abstract

Export performance has become crucial for Vietnamese manufacturing SMEs as they face digital transformation and stronger global competition. This study investigates how resource-based determinants affect the export performance of Vietnamese manufacturing SMEs, with absorptive capacity (mediation) and international competition (moderation). Cross-sectional survey data from 420 manufacturing SMEs in Vietnam were collected during February–August 2025 and completed by authorized firm representatives (owners/directors/senior managers). Partial least squares structural equation modeling (SmartPLS 4.1) with 5,000 bootstraps was employed. Digital transformation ($\beta = 0.304$, $p < 0.01$), logistics infrastructure ($\beta = 0.289$, $p < 0.01$), and human capital ($\beta = 0.284$, $p < 0.001$) are the strongest predictors; marketing capability ($\beta = 0.124$, $p < 0.01$) and access to finance ($\beta = 0.108$, $p < 0.01$) are positive. Absorptive capacity positively affects exports ($\beta = 0.161$, $p < 0.01$) and mediates four determinants (the most significant for human capital, indirect $\beta = 0.046$, $p < 0.01$). International competition strengthens the effect of human capital ($\beta = 0.115$, $p < 0.01$) but weakens marketing capability ($\beta = -0.102$, $p < 0.01$). The model explains 57.3% of the variance in export performance. These findings highlight the need for policies promoting digital adoption, logistics upgrades, and human-capital development, while firms should enhance learning capabilities and recalibrate marketing strategies under increasing competitive pressure.

Keywords exports, SMEs, RBV, absorptive capacity, competition, digital transformation

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INTRODUCTION

In the era of international economic integration and rapid technological advancement, export performance has become a crucial measure of survival and growth for small and medium-sized enterprises (SMEs) in Vietnam's manufacturing sector. Previous studies have emphasized that internal resources, such as infrastructure quality, international marketing capabilities, skilled human resources, and financial accessibility, are critical determinants of SMEs' competitiveness and global market expansion (Le et al., 2022). At the same time, operational digital transformation not only optimizes internal processes but also enables SMEs to quickly adapt to international standards, supply chain management, and logistics requirements (Tran et al., 2025).

One other important dimension is absorptive capacity, which refers to firms' ability to capture, transform, assimilate, and exploit external knowledge to enhance innovation and improve export performance

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(Lane et al., 2006; Volberda et al., 2010; Flatten et al., 2011). Furthermore, the dynamic capabilities framework suggests that in turbulent international environments, SMEs must reconfigure, integrate, and leverage their resources to sustain competitive advantage (Teece et al., 1997). However, despite increasing scholarly attention to these perspectives, empirical evidence from emerging economies such as Vietnam remains insufficient and fragmented, particularly regarding how firms operationalize resource advantages under competitive external pressures.

Although the resource-based view and dynamic capabilities have attracted increasing research interest, two critical scientific gaps remain unaddressed in the context of Vietnam. First, existing studies provide limited insight into how absorptive capacity functions as an internal mechanism linking firm resources with improved export outcomes. Second, research has yet to systematically examine how international competition alters or conditions the effectiveness of such resources, either strengthening or weakening their impact on SME export performance. These gaps indicate that current understanding of the resource–performance relationship in emerging economies remains theoretically incomplete and empirically underdeveloped. These limitations converge into a broader scientific problem, namely the absence of an integrated, empirically grounded explanation of how resource-based determinants, internal learning mechanisms, and external competitive pressures jointly shape SME export performance in Vietnam. Accordingly, the present study is motivated by the need to clarify these unresolved issues, particularly the internal processes and contextual constraints that influence SMEs' export competitiveness in an increasingly demanding international environment.

1. LITERATURE REVIEW AND HYPOTHESES

Understanding the determinants of export performance requires a comprehensive theoretical grounding that integrates internal firm resources, capability development processes, and contextual pressures shaping international competitiveness.

The resource-based view (RBV) is widely regarded as a prominent theoretical framework for explaining firm competitiveness and performance. RBV argues that firms achieve sustainable performance advantages by possessing and effectively utilizing strategic resources and distinctive competencies that are valuable, scarce, difficult to replicate, and irreplaceable (Barney, 1991). These resources can include tangible assets (e.g., infrastructure, financial capital) and intangible capabilities (e.g., managerial expertise, knowledge, organizational culture). For SMEs, such resources are particularly critical because SMEs often face significant resource constraints compared to larger firms (Barney, 1991).

Export performance, which encompasses outcomes such as export sales growth, profitability, and international market share, is closely tied to the ability of firms to mobilize their internal resources in a way that aligns with external opportunities (Zou & Stan, 1998). For Vietnamese manufacturing SMEs, integration into global value chains requires not only cost competitiveness but also the ability to adapt to international standards of quality, technology, and logistics (Le et al., 2022). This makes resource-based determinants especially critical for sustaining export success.

Operational digital transformation refers to the digitalization of internal processes, operational systems, and supply chain activities to enhance business efficiency, innovation, and responsiveness to market demands (Bharadwaj et al., 2013). In the export context, technologies such as enterprise resource planning (ERP), blockchain-enabled supply chains, warehouse management systems, and artificial intelligence-based forecasting tools improve the accuracy of demand forecasting, strengthen relationships with foreign partners, and reduce transaction costs (Gao et al., 2022; Yu et al., 2022). Empirical evidence demonstrates that operational digitalization significantly enhances export performance by improving productivity and international competitiveness, especially in emerging economies (Banga & te Velde, 2018). OECD (2019a) further shows that SMEs adopting digital tools are more likely to engage in exporting, owing to reduced information asymmetries and

enhanced global connectivity. In Vietnam, Tran et al. (2025) demonstrate that digital transformation helps SMEs standardize processes, comply with regulations, and improve logistics coordination. These findings suggest that digitalization acts not only as an efficiency-enhancing tool but also as a dynamic capability that helps firms reconfigure resources to respond to international demands.

Logistics infrastructure constitutes both a tangible resource and a capability that directly affects firms' ability to compete in international markets under the RBV. High-quality logistics services reduce transportation costs, accelerate delivery times, and enhance supply chain reliability, thereby creating value that is difficult for competitors to replicate (Barney, 1991). In export activities, efficient customs procedures, multimodal connectivity, and cold-chain services are indispensable. Empirical evidence confirms a strong link between logistics infrastructure and export outcomes. Portugal-Perez and Wilson (2012) demonstrate that both "hard infrastructure" (ports, roads, ICT) and "soft infrastructure" (customs procedures, regulatory efficiency) significantly boost export performance in developing economies. Similarly, Hoekman and Nicita (2011) highlight the role of improved logistics efficiency in reducing trade costs and enhancing SMEs' participation in global trade. Ojala et al. (2018) emphasize that logistics performance is a critical determinant of firms' ability to integrate into global value chains. In Vietnam, logistics costs are estimated to account for around 16–20% of GDP, much higher than the global average of 10–12%, creating major disadvantages for SMEs (Oh et al., 2019). Evidence shows that logistics infrastructure and service quality strongly affect economic outcomes, underscoring the need for efficient systems to enhance competitiveness (Nguyen et al., 2021). As global integration deepens under CPTPP and RCEP, logistics capability increasingly becomes a decisive factor enabling SMEs to meet delivery requirements and sustain export growth.

International marketing capability functions as an intangible resource enabling firms to identify market needs, position products, and manage cross-border relationships (Day, 1994). Strong marketing capabilities enhance export performance by improving product adaptation, pricing, distribution, and customer engagement (Zou et al., 2003; Morgan et al., 2004). This is particularly relevant for emerging-market SMEs that lack brand recognition and struggle with limited foreign market intelligence (Zhang et al., 2009). Evidence from Vietnam shows that investments in export-specific marketing activities, trade fairs, product differentiation, and international branding significantly enhance SMEs' ability to secure long-term contracts (Ngo et al., 2024; Vo et al., 2023). Thus, marketing capability remains a crucial intangible resource for firms seeking to expand and sustain export presence.

Human capital is widely recognized as a critical intangible resource for building long-term competitiveness. Human capital includes knowledge, skills, and international experience of employees and managers, enabling firms to utilize resources effectively and adapt to foreign market demands (Becker, 1994; Wright et al., 2001). High-quality human capital reduces transaction costs and facilitates internationalization, and numerous studies confirm the positive effect of human capital on firms' export performance. Managerial expertise is often considered a strategic asset that helps firms recognize and exploit global opportunities (Castanias & Helfat, 2001). Firms with higher levels of skilled labor and continuous employee training are better positioned to innovate and to compete in global markets (Crook et al., 2011; Ganotakis & Love, 2012). In Vietnam, manufacturing SMEs often face shortages of highly skilled labor in supply chain management, international marketing, and digital technologies (Nguyen et al., 2013). Nevertheless, SMEs that invest in employee training, improve foreign language proficiency, and recruit managers with international experience are more likely to succeed in export markets (Nguyen et al., 2013). With Vietnam's deeper integration into trade agreements such as CPTPP and RCEP, strengthening human capital has become an urgent priority for sustaining export competitiveness.

Within the RBV, financial resources are a fundamental tangible asset that enables firms to mobilize and combine complementary capabilities such as technology, skilled labor, and marketing to enhance competitiveness (Barney, 1991). For exporting SMEs, finance is essential to support

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investments in product adaptation, certification, logistics, and working capital. Without affordable financing, these activities are constrained, undermining export performance. Prior studies have shown that SMEs in developing countries face severe credit constraints that limit their internationalization (Minetti & Zhu, 2011). Recent evidence confirms that firms with better access to trade finance instruments, such as export credits and bank guarantees, achieve higher levels of export intensity and survival in international markets (Wagner, 2019). In Vietnam, access to finance remains a major obstacle for Vietnamese exporting manufacturing SMEs, and empirical evidence indicates that improved financial access enhances their productivity while persistent constraints diminish it, underscoring finance as a critical antecedent of export competitiveness (Mai et al., 2019; Nguyen, 2023). Survey-based evidence further indicates that government support policies, including tax incentives, credit incentives, trade promotion, and customs reforms, play a crucial role in enhancing export outcomes, with trade promotion being the most impactful and credit incentives the least (Vo et al., 2023). Overall, access to finance is expected to be a decisive factor shaping the export performance of Vietnamese manufacturing SMEs.

Absorptive capacity is a cornerstone concept explaining how firms transform external knowledge into competitive advantage. Cohen and Levinthal (1990) defined it as a firm's ability to recognize, assimilate, and apply external knowledge for commercial purposes. Zahra and George (2002) advanced this view by dividing absorptive capacity into potential capacity, which involves the capture and integration of external knowledge, and realized capacity, which reflects the transformation and utilization of that knowledge. Within the RBV and the dynamic capabilities framework, absorptive capacity functions as a higher-order capability that allows firms to reconfigure and leverage resources in response to environmental turbulence (Teece et al., 1997). Empirical research highlights its mediating role in linking firm resources to performance outcomes. Lane et al. (2006) demonstrated that absorptive capacity operates through organizational learning processes, thereby enhancing innovation and supporting long-term competitiveness. Flatten et al. (2011) validated a multidimensional scale of absorptive capacity and confirmed its positive link with innovation outcomes. Volberda et al. (2010) further showed that stronger absorptive capacity enables firms to exploit external linkages more effectively. Subsequent studies emphasize the intermediary role of absorptive capacity in connecting knowledge inflows with innovation, thereby influencing both technological advancement and financial performance (Kostopoulos et al., 2011).

In the international business context, absorptive capacity is particularly vital for SMEs operating under resource constraints. By acquiring and assimilating external knowledge through partnerships, participation in global value chains, and adoption of advanced technologies, SMEs can enhance their innovation capability and improve export competitiveness. Studies in export-oriented firms confirm that absorptive capacity directly strengthens international performance and mediates the effect of knowledge-search strategies on export outcomes (Ferreras-Méndez et al., 2019). Evidence from Vietnam further underscores the importance of absorptive capacity. Vu (2020) found that Vietnamese manufacturing firms benefit from foreign spillovers only after surpassing certain absorptive capacity thresholds, suggesting that investments in learning and knowledge systems are necessary conditions for international competitiveness. Likewise, policy reports highlight that limited R&D investment and weak knowledge linkages constrain the development of absorptive capacity among Vietnamese SMEs, reducing their ability to transform internal resources into sustainable export advantages (OECD, 2021). Consequently, absorptive capacity is expected to function as a crucial mediating mechanism between resource-based determinants and export performance in Vietnamese manufacturing SMEs.

From an industrial organization perspective, rising competitive intensity compels firms to reduce costs, differentiate, and accelerate innovation (Porter, 1980). Within the dynamic capabilities framework, competitive intensity serves as a boundary condition that shapes how firms deploy and reconfigure internal resources under turbulent environments (Teece, 2007). These perspectives imply that international competition can significantly condition the link between resource-

based determinants and export performance. Empirical evidence supports this moderating role. Cadogan et al. (2009) found that the link between export market orientation and export performance depends on the level of market dynamism and firm internationalization. Similarly, Morgan et al. (2009) demonstrated that marketing capabilities yield stronger performance effects under competitive environments, while Efrat et al. (2018) showed that dynamic export capabilities enhance competitive advantage and firm outcomes in turbulent international markets. Overall, competitive intensity emerges as a key contextual factor influencing export-performance determinants (Chen et al., 2016). For Vietnamese manufacturing SMEs, recent participation in trade agreements such as CPTPP, EVFTA, and RCEP has both expanded export opportunities and heightened international competition. These agreements expose SMEs to stricter quality standards, rapidly shifting consumer preferences, and more powerful global competitors. According to the World Bank (2020), Vietnamese firms must upgrade capabilities in logistics, digital transformation, and marketing to convert such pressures into sustainable export gains. OECD (2021) further notes that limited innovation and managerial capacities remain key bottlenecks for SMEs, making international competition a decisive contextual factor. These insights suggest that competitive pressures are likely to condition whether firm resources translate effectively into export performance, particularly in the context of emerging economies such as Vietnam.

In summary, existing literature highlights the importance of internal resources, capability development, and external pressures in shaping export performance. However, prior research in Vietnam remains fragmented and has not jointly examined (i) how absorptive capacity mediates the effects of key resource-based determinants, and (ii) how international competition moderates these relationships. These gaps indicate the need for a more integrated model linking the resource-based view (RBV), dynamic capabilities, and contextual boundary conditions.

Accordingly, the purpose of this study is to examine how five resource-based determinants (operational digital transformation, logistics infrastructure quality, international marketing capability, human capital quality, and financial access) affect the export performance of Vietnamese manufacturing SMEs, with absorptive capacity as a mediator and international competition as a moderator. Figure 1 shows the conceptual model.

Drawing on the resource-based view and dynamic capabilities, this study proposes the following hypotheses:

H1: Operational digital transformation is positively linked to export performance.

H2: Logistics infrastructure quality is positively linked to export performance.

H3: International marketing capability is positively linked to export performance.

H4: Human capital quality is positively linked to export performance.

H5: Financial access is positively linked to export performance.

H6a: Operational digital transformation is positively linked to absorptive capacity.

H6b: Logistics infrastructure quality is positively linked to absorptive capacity.

H6c: International marketing capability is positively linked to absorptive capacity.

H6d: Human capital quality is positively linked to absorptive capacity.

H6e: Access to finance is positively linked to absorptive capacity.

H7: Absorptive capacity is positively linked to export performance.

H8a: Absorptive capacity serves as a mediator linking operational digital transformation and export performance.

H8b: Absorptive capacity serves as a mediator linking logistics infrastructure quality and export performance.

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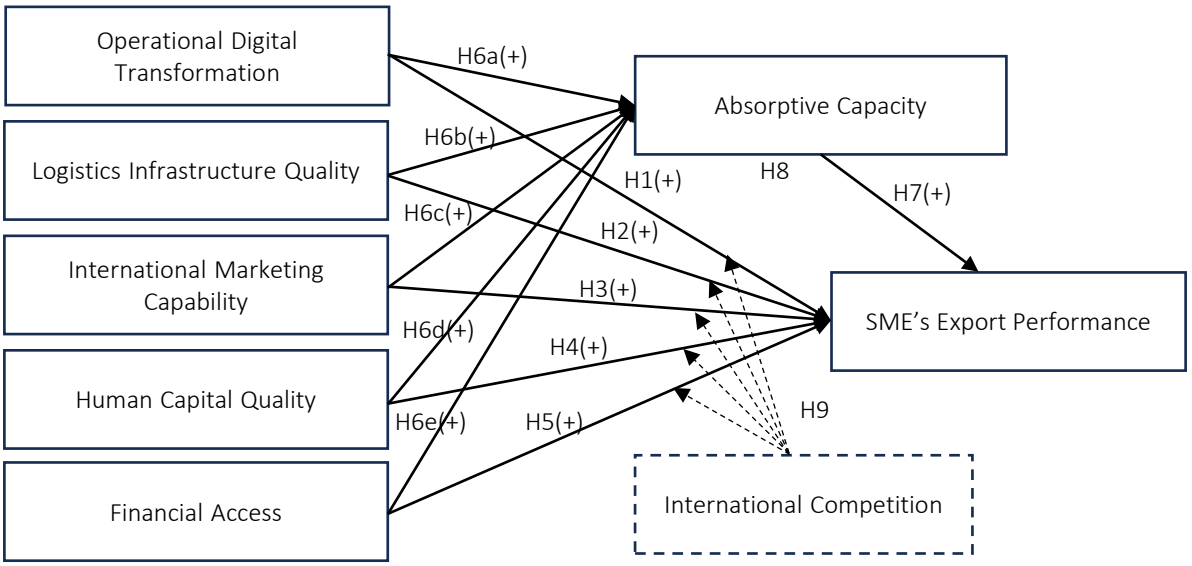

Figure 1. Proposed research model

H8c: Absorptive capacity serves as a mediator linking international marketing capability and export performance.

H8d: Absorptive capacity serves as a mediator linking human capital quality and export performance.

H8e: Absorptive capacity serves as a mediator linking finance access and export performance.

H9: International competition moderates the relationships between resource-based determinants and export performance.

2. METHODS

This study employs a quantitative research design using a survey of Vietnamese manufacturing SMEs. A survey-based approach is appropriate because the key constructs (export performance, operational digital transformation, logistics infrastructure quality, international marketing capability, human capital quality, absorptive capacity, and perceived international competition) are latent, firm-level, and partly perceptual in nature. These constructs cannot be directly observed in secondary data (e.g., customs statistics or financial statements) and therefore require standardized multi-item scales for reliable cross-firm measurement (Morgan et al., 2009; Zou & Stan, 1998).

The proposed model was assessed using structural equation modeling based on the partial least squares approach (PLS-SEM). This method is particularly suitable for exploratory models with mediation and moderation, and for studies with relatively small sample sizes (Hair et al., 2019).

The target population consists of manufacturing SMEs in Vietnam that have engaged in export activities within the last three years. Sampling frames were obtained from official SME directories and government databases. Stratified sampling was applied to capture firms from diverse manufacturing subsectors, including textiles and garments, food processing, furniture, and electronics. A structured survey was then conducted between February and August 2025. Questionnaires (Appendix A) were distributed both online via Google Forms (through SME associations and email lists) and in person through local chambers of commerce. Respondents were typically senior managers, directors, or owners directly responsible for international operations, ensuring that the information collected accurately reflects firms' export strategies and outcomes. Participation was entirely voluntary, and respondents retained full discretion over whether to answer any question. All responses were kept anonymous and used solely for academic research purposes. All constructs in the questionnaire were measured using established multi-item scales adapted from prior empirical studies. All items were assessed using

Table 1. Descriptive statistics of the survey sample

Category	Sub-category	Frequency	Percentage (%)
Manufacturing Subsector	Textiles and Garments	110	26.19
	Food Processing	95	22.62
	Wood/Furniture	85	20.24
	Electronics	90	21.43
	Others	40	9.52
Firm Size	< 50 employees	146	34.76
	50–100 employees	125	29.76
	101–200 employees	86	20.48
	> 200 employees	63	15.00

Note: n = 420.

a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Out of 500 distributed questionnaires, 436 were returned, of which 420 were deemed valid after screening for missing values and inconsistencies. This final sample size not only surpasses the "10-times rule" minimum of 60 observations and the recommended range of 150–300 for medium-complexity PLS-SEM models (Hair et al., 2017, 2021), but also provides strong statistical power and reliability for subsequent analysis.

Table 1 presents the characteristics of the survey samples by subsector and firm size. The distribution shows that textiles and garments, food processing, wood and furniture, and electronics account for the majority of respondents, with a small proportion belonging to other subsectors. In terms of labor size, most enterprises employ fewer than 200 workers, consistent with the definition of SMEs in Vietnam, while a smaller number of firms with more than 200 employees are also represented. In addition, a smaller proportion of firms fall into the "Others" category, which mainly includes producers of plastics and rubber products, metal and machinery manufacturing, and packaging and printing. These subsectors, though modest in scale, also participate in export activities and contribute to the diversity of Vietnam's export-oriented manufacturing SMEs.

The data were analyzed using SmartPLS 4.1 following a two-step approach. First, the measurement model was evaluated through indicator reliability (outer loadings), internal consistency (through Cronbach's alpha, together with composite reliability), evidence of convergent validity (AVE), and discriminant validity (HTMT ratio). Second, the structural model was evaluated by examining collinearity diagnostics (VIF), path coefficients (β), and coefficient of determination (R^2 and adjusted R^2). The significance of hypothesized direct, mediating, and moderating effects was tested using bootstrapping with 5,000 resamples. Indirect effects were assessed through bootstrapped confidence intervals, and moderating effects were evaluated by estimating the interaction terms.

3. RESULTS

Table 2 reports the results of the measurement model assessment, i.e., construct reliability and validity. Overall, the findings indicate that all constructs meet the recommended thresholds suggested by Hair et al. (2019, 2021). Specifically, all outer loadings are above the minimum acceptable level of 0.70, with most items loading strongly (>0.75) on their respective constructs. This demonstrates that the observed indicators reliably represent the underlying latent variables.

In terms of internal consistency, Cronbach's Alpha values for all constructs range from 0.833 to 0.907, exceeding the recommended cut-off of 0.70. Composite reliability (CR) values are also high, ranging between 0.880 and 0.931, which further confirms internal consistency reliability. The AVE values of all constructs exceed the 0.50 threshold, ranging from 0.595 to 0.732, which supports the presence of convergent validity.

In summary, Table 2 provides strong evidence that the measurement scales used in this study are both reliable and valid. Therefore, the measurement model demonstrates satisfactory reliability and validity, providing a solid basis for further structural model analysis using PLS-SEM.

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Table 2. Construct reliability and validity

No.	Variables		Outer loadings	Cronbach's Alpha	CR	AVE
1	Operational Digital Transformation (ODT)	ODT1	0.834	0.880	0.913	0.680
		ODT2	0.713			
		ODT3	0.782			
		ODT4	0.843			
		ODT5	0.936			
2	Logistics Infrastructure Quality (LIQ)	LIQ1	0.778	0.833	0.880	0.595
		LIQ2	0.716			
		LIQ3	0.764			
		LIQ4	0.794			
		LIQ5	0.803			
3	International Marketing Capability (IMC)	IMC1	0.823	0.898	0.924	0.710
		IMC2	0.855			
		IMC3	0.871			
		IMC4	0.856			
		IMC5	0.807			
4	Human Capital Quality (HCQ)	HCQ1	0.845	0.907	0.931	0.732
		HCQ2	0.830			
		HCQ3	0.753			
		HCQ4	0.888			
		HCQ5	0.950			
5	Financial Access (FA)	FA1	0.798	0.869	0.905	0.656
		FA2	0.795			
		FA3	0.736			
		FA4	0.875			
		FA5	0.840			
6	Absorptive Capacity (AC)	AC1	0.841	0.890	0.920	0.697
		AC2	0.809			
		AC3	0.729			
		AC4	0.870			
		AC5	0.913			
7	Export Performance (EP)	EP1	0.854	0.856	0.896	0.635
		EP2	0.792			
		EP3	0.721			
		EP4	0.827			
		EP5	0.783			

Table 3. Discriminant validity – Heterotrait-monotrait ratio matrix

	AC	EP	FA	HCQ	IMC	LIQ	ODT
AC							
EP	0.572						
FA	0.334	0.387					
HCQ	0.513	0.616	0.363				
IMC	0.367	0.462	0.185	0.322			
LIQ	0.329	0.573	0.153	0.372	0.322		
ODT	0.425	0.600	0.322	0.369	0.350	0.321	

Note: ODT = Operational Digital Transformation; LIQ = Logistics Infrastructure Quality; IMC = International Marketing Capability; HCQ = Human Capital Quality; FA = Financial Access; AC = Absorptive Capacity; EP = Export Performance.

Table 3 presents the discriminant validity of the constructs based on the heterotrait-monotrait ratio (HTMT). Henseler et al. (2015) suggest that discriminant validity is confirmed when HTMT values are below the conservative threshold of 0.85 or the more lenient threshold of 0.90. The results show that all HTMT values among the latent constructs are below 0.85, ranging from 0.153 to 0.616. These findings confirm that each construct in the measurement model is empirically distinct from the others, thereby satisfying the criterion of discriminant validity. This ensures that the constructs do not overlap conceptually and that they capture unique aspects of the resource-based determinants, absorptive capacity, and export performance. Together with the results in Table 2, these outcomes provide robust evidence of the measurement model's adequacy regarding construct consistency and validity, thereby establishing a solid foundation for subsequent testing of the structural relationships.

Table 4 presents the bootstrapping results of the direct effects in the structural model. All hypotheses (H1–H7) are supported, as the path coefficients are statistically significant with *p*-values below 0.05. Variance Inflation Factor (VIF) values range from 1.164 to 1.998, all well below the threshold of 5, indicating no multicollinearity concerns among the predictors.

Among the direct effects on export performance (EP), operational digital transformation (ODT → EP, β = 0.304, $p < 0.001$), logistics infrastructure quality (LIQ → EP, β = 0.289, $p < 0.001$), and human capital quality (HCQ → EP, β = 0.284, $p < 0.001$) exert the strongest influences. International marketing capability (IMC → EP, β = 0.124, $p = 0.002$) and financial access (FA → EP, β = 0.108, $p = 0.005$) also contribute positively, albeit with comparatively smaller effect sizes.

With respect to absorptive capacity (AC), all resource-based determinants have significant positive effects. The strongest predictor is human capital quality (HCQ → AC, β = 0.288, $p < 0.001$), followed by operational digital transformation (β = 0.177, $p < 0.001$), international marketing capability (β = 0.143, $p = 0.002$), financial access (β = 0.121, $p = 0.005$), and logistics infrastructure quality (β = 0.091, $p = 0.032$). Finally, absorptive capacity itself exerts a significant positive effect on export performance (AC → EP, β = 0.161, $p < 0.001$), underscoring its role as a critical dynamic capability that enhances SME export outcomes.

Overall, these findings demonstrate that all proposed resource-based determinants are valid predictors of both absorptive capacity and export performance. The results particularly highlight the strong contributions of operational digital transformation, logistics infrastructure quality, and human capital quality in shaping export success among Vietnamese manufacturing SMEs.

Table 5 reports the bootstrapping results for the indirect effects mediated by absorptive capacity (AC). Four out of the five hypothesized mediation paths (H8a, H8c, H8d, H8e) are supported, while one (H8b) is rejected. Specifically, the mediating role of AC is significant in the relationships between operational digital transformation and ex-

Table 4. Bootstrapping results of direct effects

Hypothesis	Path	Original sample	VIF	p-value	Conclusion
H1	ODT → EP	0.304	1.523	0.000	Accepted
H2	LIQ → EP	0.289	1.492	0.000	Accepted
H3	IMC → EP	0.124	1.702	0.002	Accepted
H4	HCQ → EP	0.284	1.998	0.000	Accepted
H5	FA → EP	0.108	1.250	0.005	Accepted
H6a	ODT → AC	0.177	1.262	0.000	Accepted
H6b	LIQ → AC	0.091	1.211	0.032	Accepted
H6c	IMC → AC	0.143	1.196	0.002	Accepted
H6d	HCQ → AC	0.288	1.327	0.000	Accepted
H6e	FA → AC	0.121	1.164	0.005	Accepted
H7	AC → EP	0.161	1.593	0.000	Accepted

Note: ODT = Operational Digital Transformation; LIQ = Logistics Infrastructure Quality; IMC = International Marketing Capability; HCQ = Human Capital Quality; FA = Financial Access; AC = Absorptive Capacity; EP = Export Performance.

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Table 5. Bootstrapping results of indirect effects

Hypothesis	Path	Original sample	p-values	Conclusion
H8a	ODT → AC → EP	0.028	0.012	Accepted
H8b	LIQ → AC → EP	0.015	0.074	Rejected
H8c	IMC → AC → EP	0.023	0.018	Accepted
H8d	HCQ → AC → EP	0.046	0.002	Accepted
H8e	FA → AC → EP	0.019	0.031	Accepted

Note: ODT = Operational Digital Transformation; LIQ = Logistics Infrastructure Quality; IMC = International Marketing Capability; HCQ = Human Capital Quality; FA = Financial Access; AC = Absorptive Capacity; EP = Export Performance.

port performance (ODT → AC → EP, β = 0.028, p = 0.012), international marketing capability and export performance (IMC → AC → EP, β = 0.023, p = 0.018), human capital quality and export performance (HCQ → AC → EP, β = 0.046, p = 0.002), and financial access and export performance (FA → AC → EP, β = 0.019, p = 0.031). Among these, human capital quality exerts the strongest indirect effect through AC, confirming the critical role of skilled human resources in leveraging external knowledge for export success.

In contrast, the indirect effect of logistics infrastructure quality on export performance via AC (LIQ → AC → EP, β = 0.015, p = 0.074) is not statistically significant. This suggests that while logistics infrastructure directly enhances export performance (as shown in Table 4), it does not substantially contribute to building absorptive capacity as a mechanism for improved export outcomes. These results confirm the partial mediating role of absorptive capacity in the model. Absorptive capacity acts as an important channel through which most resource-based determinants enhance export performance, but its mediating effect is not uniform across all resources.

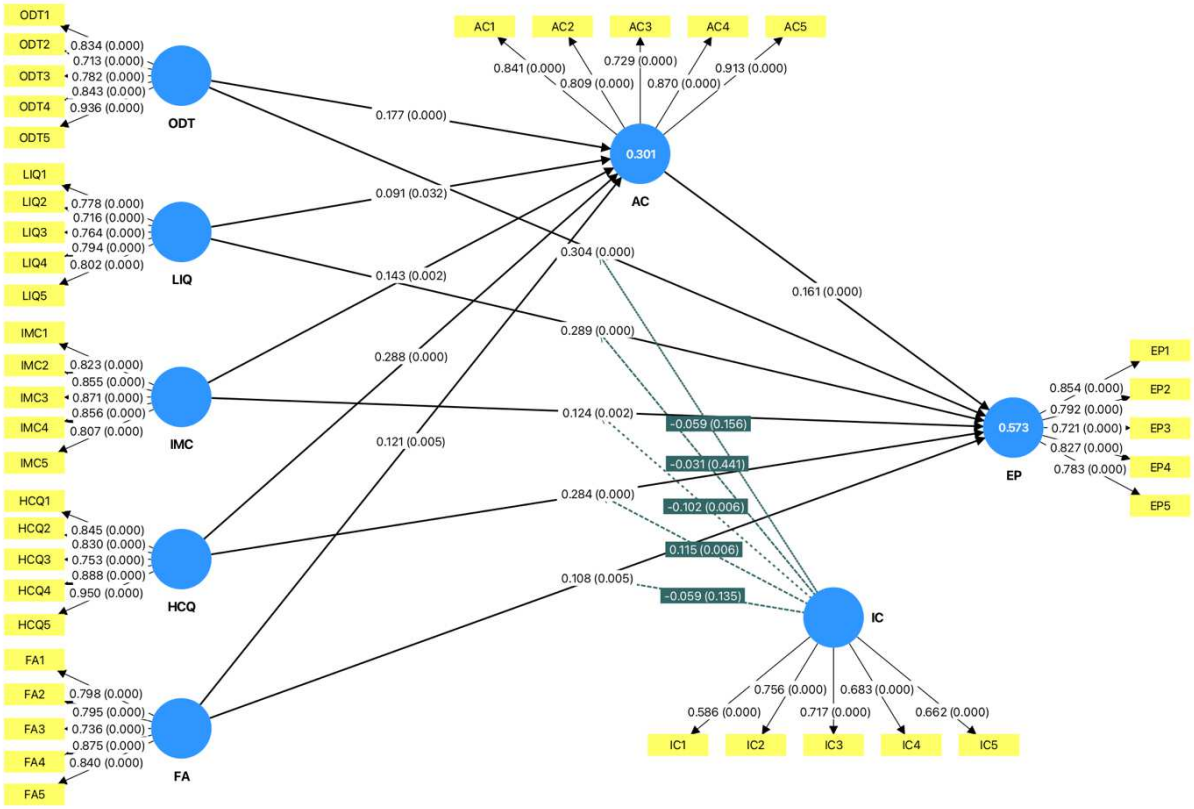
Table 6 presents the results of the moderating effects of international competition (IC) on the relationships between resource-based determinants and export performance (EP). The findings show that only two moderation paths are statistically significant. Specifically, international competition positively strengthens the effect of human capital quality on export performance (IC × HCQ → EP, β = 0.115, p = 0.006), suggesting that firms with high-quality human capital are better able to leverage competitive pressure in international markets to improve their export outcomes. Conversely, international competition negatively moderates the relationship between international marketing capability and export performance (IC × IMC → EP, β = –0.102, p = 0.006), implying that under intense competitive conditions, marketing efforts alone may not translate into improved export results, possibly due to resource constraints or aggressive strategies from foreign competitors.

The moderating effects of international competition on financial access, logistics infrastructure quality, and operational digital transformation are not significant, as indicated by p-values above 0.05. This suggests that the impact of these determinants on export performance remains relatively stable regardless of the level of international competition. Overall, the results highlight that international competition plays a selective moderating role in the model. While it amplifies the benefits of human capital quality, it dampens the positive effect of international marketing capability, underscoring the complex ways in which external market conditions interact with firm resources in shaping export performance.

Table 6. Moderating effects of international competition

Hypothesis	Path	Original sample	VIF	p-values	Conclusion
H9	IC x FA → EP	–0.059	1.292	0.135	Rejected
	IC x HCQ → EP	0.115	1.690	0.006	Accepted
	IC x IMC → EP	–0.102	1.314	0.006	Accepted
	IC x LIQ → EP	–0.031	1.614	0.441	Rejected
	IC x ODT → EP	–0.059	1.337	0.156	Rejected

Note: ODT = Operational Digital Transformation; LIQ = Logistics Infrastructure Quality; IMC = International Marketing Capability; HCQ = Human Capital Quality; FA = Financial Access; AC = Absorptive Capacity; EP = Export Performance.



Note: ODT = Operational Digital Transformation; LIQ = Logistics Infrastructure Quality; IMC = International Marketing Capability; HCQ = Human Capital Quality; FA = Financial Access; AC = Absorptive Capacity; EP = Export Performance.

Figure 2. Confirmed research model

Table 7 reports the coefficient of determination (R^2) and adjusted R^2 values for the two dependent variables in the model. The adjusted R^2 value for absorptive capacity (AC) is 0.301, indicating that 30.1% of the variance in AC is explained by the set of resource-based determinants (ODT, LIQ, IMC, HCQ, FA). This suggests a moderate explanatory power for the predictors in shaping firms' absorptive capacity.

Table 7. R-squared and R-squared adjusted coefficients

Dependent variables	R-squared	R-squared adjusted
AC	0.309	0.301
EP	0.586	0.573

For export performance (EP), the adjusted R^2 value is 0.573, meaning that 57.3% of the variance in EP is accounted for by both the resource-based determinants and absorptive capacity. According to the guidelines of Hair et al. (2019), this level of R^2 can be considered substantial in the context of social science research, particularly in studies involving SMEs where multiple external factors also influence export outcomes.

These results demonstrate that the proposed model has satisfactory explanatory power, with a stronger predictive capacity for export performance than for absorptive capacity (Figure 2). This finding underscores the robustness of the conceptual framework in capturing the key drivers of export success among Vietnamese manufacturing SMEs.

4. DISCUSSION

This study provides strong evidence that resource-based determinants significantly shape the export performance of Vietnamese manufacturing SMEs. In line with the RBV, both tangible resources (logistics infrastructure, financial access) and intangible capabilities (digital transformation, international marketing capability, and human capital quality) enhance SMEs' competitiveness in international markets. Among these, operational digital transformation ($\beta = 0.304$, $p < 0.001$), logistics infrastructure

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quality (β = 0.289, $p < 0.001$), and human capital quality (β = 0.284, $p < 0.001$) exert the strongest direct effects, underscoring their strategic role in sustaining export performance.

The finding on digital transformation confirms prior studies by Banga and te Velde (2018) and OECD (2019b), which emphasize its positive impact on productivity and connectivity. Consistent with Tran et al. (2025), digital adoption enables SMEs to comply with international standards and improve logistics coordination. This extends earlier evidence by showing that digitalization functions not only as a technological tool but also as a dynamic capability in emerging economies.

Results on logistics infrastructure also align with global studies by Portugal-Perez and Wilson (2012) and Hoekman and Nicita (2011), which highlight its role in reducing trade costs. However, the mediation analysis reveals a divergence: while logistics infrastructure improves export performance directly (β = 0.289, $p < 0.001$), it does not significantly enhance absorptive capacity (β = 0.015, $p = 0.074$). This finding contrasts with Ojala et al. (2018), who associate infrastructure improvements with organizational learning, suggesting that in the Vietnam context, infrastructure yields immediate efficiency gains rather than long-term knowledge-based benefits.

For human capital, findings corroborate earlier work stressing managerial expertise as a strategic asset (Castanias & Helfat, 2001; Ganotakis & Love, 2012). Consistent with Nguyen et al. (2013), SMEs with internationally experienced employees achieve superior outcomes. Moreover, human capital exerts the strongest indirect effect via absorptive capacity (β = 0.046, $p = 0.002$), confirming its dual role in driving both direct and knowledge-mediated advantages.

The results on international marketing capability (IMC) partly confirm prior evidence by Zou et al. (2003) and Morgan et al. (2004), which emphasize its positive direct effect on export performance (β = 0.124, $p = 0.002$). However, under conditions of intense competition, this effect becomes weaker (β = –0.102, $p = 0.006$), diverging from findings in developed economies where marketing capabilities typically yield stronger benefits in rivalrous contexts (Efrat et al., 2018). This pattern suggests that Vietnamese SMEs, constrained by resource limitations and modest brand visibility, face challenges in leveraging marketing-based advantages when competing directly with global firms.

For financial access, the results are consistent with Minetti and Zhu (2011) and Wagner (2019), who highlight its importance in overcoming credit constraints. Accordingly, financial access contributes positively to export performance (β = 0.108, $p = 0.005$) and modestly to absorptive capacity (β = 0.121, $p = 0.005$), functioning more as an enabling condition than a primary driver.

The analysis of absorptive capacity underscores its role as a key mediating mechanism. Four of the five determinants indirectly enhance export performance through this channel, with human capital showing the strongest mediation effect. These findings confirm that learning and knowledge transformation are indispensable for translating resources into sustained export success.

The moderating role of international competition (IC) provides nuanced insights. It strengthens the effect of human capital (β = 0.115, $p = 0.006$), aligning with Cadogan et al. (2009). Conversely, international competition reduces the effectiveness of international marketing capability (β = –0.102, $p = 0.006$), a pattern that differs from evidence in developed markets where firms often achieve higher returns from marketing activities under competitive pressure (Efrat et al., 2018). It does not significantly moderate the effects of digital transformation, logistics infrastructure, or financial access, indicating that these determinants provide stable performance benefits regardless of competition intensity.

CONCLUSION

This study examined how five resource-based determinants (operational digital transformation, logistics infrastructure quality, international marketing capability, human capital quality, and financial access) affect the export performance of Vietnamese manufacturing SMEs, with absorptive capacity as a

mediator and international competition as a moderator. Using cross-sectional data from 420 firms and PLS-SEM, the paper provides a comprehensive empirical test of an integrated RBV–dynamic capabilities framework.

Empirically, the findings demonstrate that operational digital transformation, logistics infrastructure quality, and human capital quality exert the strongest direct effects on export performance, while marketing capability and access to finance show smaller yet significant contributions. Absorptive capacity enhances export outcomes and mediates several determinant-performance links, particularly those involving human capital. Moreover, international competition intensifies the impact of human capital but weakens that of marketing capability, suggesting that contextual pressures shape the effectiveness of resource deployment in emerging economies. The model explains 57.3% of the variance in export performance, confirming robust explanatory power.

From a theoretical standpoint, this study extends the resource-based view by incorporating absorptive capacity and dynamic capabilities into a single framework, clarifying how and when firm resources translate into superior export performance. In practical terms, the results emphasize the need for both policymakers and managers to foster digital adoption, logistics modernization, and especially human capital development, alongside building organizational learning systems that strengthen absorptive capacity and sustain competitiveness under global pressure.

Although the study offers meaningful insights, several limitations should be acknowledged. First, the cross-sectional research design restricts the ability to capture dynamic changes in SME capabilities and export outcomes over time. Second, the analysis is based on survey data from manufacturing SMEs in Vietnam, which may limit the generalizability of results to other sectors or countries. Third, measurement constraints and reliance on self-reported data may lead to response biases.

Future research directions should address these limitations by adopting longitudinal and mixed-method designs to examine causal relationships, expanding samples to cover diverse sectors and countries, and integrating qualitative methods to capture contextual nuances. Moreover, further studies could explore additional moderating factors such as institutional quality, global value chain participation, or sustainability practices, thereby enriching the understanding of how resource-based determinants translate into export competitiveness under varying external conditions.

AUTHOR CONTRIBUTIONS

Conceptualization: Bui Van Vien, Tran The Tuan.
Data curation: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Formal analysis: Bui Van Vien, Tran The Tuan.
Funding acquisition: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Investigation: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Methodology: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Project administration: Bui Van Vien, Tran The Tuan.
Resources: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Software: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Supervision: Bui Van Vien, Tran The Tuan.
Validation: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Visualization: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.
Writing – original draft: Bui Van Vien, Tran The Tuan.
Writing – review & editing: Bui Van Vien, Vo Huu Khanh, Tran The Tuan.

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APPENDIX A

Survey

Hello Sir/Madam!

My name is Bui Van Vien, Faculty of Management, University of Transport Technology. I am conducting a research survey to examine how resource-based determinants influence the export performance of Vietnamese manufacturing SMEs. Your participation will greatly contribute to improving the understanding of factors that shape SMEs' competitiveness in international markets.

Participation in this survey is entirely voluntary, and you may choose to skip any question or withdraw at any time. All information you provide will be used solely for academic research purposes.

To ensure data security, all responses are kept strictly confidential, used only for research, and reported in an aggregated and anonymous form. No personally identifiable information will be collected or disclosed for any commercial or administrative purpose.

Thank you sincerely for your time and support. Your input is highly appreciated.

PART 1: RESPONDENTS' PERSONAL INFORMATION

1. Gender ☐ Male ☐ Female

2. Age ☐ Under 30 ☐ 30–40 ☐ 41–50 ☐ Over 50

3. Firm's Primary Business Sector

☐ Textile & Garment ☐ Food Processing ☐ Wood/Furniture

☐ Electronics ☐ Other (please specify):

4. Respondent's Position in the Enterprise

☐ Business Owner/Founder ☐ Managing Director/ CEO

☐ Deputy Director/Deputy Manager ☐ Head of Export/International Business

☐ Head of Production/Operations ☐ Head of Marketing/Sales

☐ Other (please specify):

5. Years of Export Experience of the Firm

☐ Less than 3 years ☐ 3–7 years ☐ More than 7 years

6. Number of Employees in Your Firm

☐ ≤ 50 employees ☐ 50–100 employees

☐ 101–200 employees ☐ > 200 employees

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PART 2: INTERNAL RESOURCES AND CAPABILITIES OF YOUR FIRM

Please rate the following statements on a 5-point scale, with 1: Completely disagree and 5: Completely agree.

No.	Survey Statement	Code	1	2	3	4	5
1. Operational Digital Transformation (ODT)							
1.1	We adopt digital platforms to support export operations.	ODT1					
1.2	Our production and logistics data are digitally integrated to coordinate with foreign partners.	ODT2					
1.3	We use data analytics to forecast export demand and plan shipments.	ODT3					
1.4	Digital tools have streamlined our export documentation and compliance.	ODT4					
1.5	Investment in digital technologies has improved our responsiveness to export markets.	ODT5					
2. Logistics Infrastructure Quality (LIQ)							
2.1	We have reliable access to ports/air cargo and domestic transport corridors.	LIQ1					
2.2	The export customs and clearance procedures we face are efficient and predictable.	LIQ2					
2.3	Lead times for export shipments are short and consistent.	LIQ3					
2.4	Cold-chain/warehouse/bonded services we use meet international buyer requirements.	LIQ4					
2.5	Logistics service providers (3PLs) we work with are responsive and dependable.	LIQ5					
3. International Marketing Capability (IMC)							
3.1	We conduct systematic research on target export markets and customers.	IMC1					
3.2	We can effectively position and differentiate our products in foreign markets.	IMC2					
3.3	Our firm builds and maintains strong relationships with foreign distributors/buyers.	IMC3					
3.4	We adapt pricing, branding, and promotions to specific export markets.	IMC4					
3.5	We respond quickly to changes in preferences and regulations abroad.	IMC5					
4. Human Capital Quality (HCQ)							
4.1	Employees possess adequate foreign-language and cross-cultural skills for export tasks.	HCQ1					
4.2	Managers have prior international business experience.	HCQ2					
4.3	We provide continuous training for export, quality, and compliance standards.	HCQ3					
4.4	Our technical workforce can meet international product/process specifications.	HCQ4					
4.5	We can attract and retain skilled employees critical to export operations.	HCQ5					
5. Financial Access (FA)							
5.1	It is easy for our firm to obtain bank loans/credit lines to finance export orders.	FA1					
5.2	We have access to trade-finance instruments (L/Cs, export credit insurance).	FA2					
5.3	The interest rates and collateral requirements we face are reasonable.	FA3					
5.4	We can secure financing to upgrade technology for export compliance.	FA4					
5.5	Government credit support programs for exporters are accessible to our firm.	FA5					
6. Absorptive Capacity (AC)							
6.1	We effectively acquire relevant external knowledge from partners/buyers.	AC1					
6.2	We systematically assimilate and share external knowledge within the firm.	AC2					
6.3	We transform external knowledge into improved processes/products.	AC3					
6.4	We exploit new knowledge to address export market needs.	AC4					
6.5	Our routines support continual learning from global value chains.	AC5					
7. Export Performance (EP)							
7.1	Our export sales have increased over the past three years.	EP1					
7.2	Our export profitability has improved relative to key competitors.	EP2					
7.3	Our export market share in target markets has expanded.	EP3					
7.4	Our export customer retention is high and improving.	EP4					
7.5	Overall, our export performance meets/exceeds our objectives.	EP5					
8. International Competition (IC)							
8.1	Competition in our export markets is intense.	IC1					
8.2	Prices are highly competitive in our export markets.	IC2					
8.3	Foreign rivals introduce new products frequently.	IC3					
8.4	Customer preferences in our export markets change rapidly.	IC4					
8.5	We face strong pressure to improve quality and reduce costs to stay competitive.	IC5					

Sincerely thank!