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Research article

Intra-provincial tourism linkages for sustainable development: Evidence from tourism enterprises

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ABSTRACT

This study aims to identify how internal and external enterprise factors shape the effectiveness of intra-provincial tourism linkages for sustainable destination development in Phu Tho, Vietnam. The research employs a survey of 380 tourism enterprises and analyses the data using Partial Least Squares Structural Equation Modeling in a two-stage approach with five thousand bootstrap resamples. Results show that both internal enterprise factors (managerial capacity and enterprise resources) and external enterprise factors (local government planning and policies, local tourism resource, tourism infrastructure and supporting facilities, and demand conditions) have positive, statistically significant effects on linkage effectiveness, with external factors exerting the stronger influence. Moderation tests indicate significant effects of enterprise size and years of experience on the relationship between internal factors and linkage effectiveness, and of geographical area of operation on the relationship between external factors and linkage effectiveness; enterprise type does not moderate these relationships. The findings imply priorities for provincial coordination mechanisms, investment in soft and digital infrastructure, and cluster-based product development, alongside capability building tailored to firm size, tenure, and spatial conditions. The study's value lies in integrating formative higher-order constructs with contextual moderators on a large enterprise sample to generate actionable evidence for sustainable intra-provincial tourism governance.

KEYWORDS

Linkages, tourism, intra-provincial, enterprises, sustainability

Introduction

In the context of an increasingly competitive tourism industry and the global shift toward sustainable development, linkages in tourism development have become essential due to the multiple benefits they offer to local destinations (Lekgau et al., 2024; Scheyvens, 2018; Telfer, 2014). Goal 17 of the United Nations' 2030 Agenda for Sustainable Development emphasizes the need to "strengthen the means of implementation and revitalize the global partnership for sustainable development," highlighting the critical role of collaboration and integrated development as key drivers in realizing sustainable development opportunities (Huck, 2023). Tourism linkage denotes structured collaboration and exchange among actors across the tourism value chain in managing and operating activities (Van Hoa Hoang et al., 2018). Such arrangements optimize resources, leverage place-specific natural and infrastructural assets (Lekgau et al., 2024; Scheyvens, 2018), and align stakeholders in product development, service delivery, destination branding, and environmental protection. Effective arrangements enhance competitiveness, attract investment, and increase visitation (Tinsley & Lynch, 2001), supporting long-term sustainability outcomes (Scheyvens, 2018). Recognizing this, governments embed area-based coordination in development plans (Van Hoa Hoang et al., 2018). Firms respond via alliances and networks to share costs/risks and bundle offerings, strengthening competitive advantage. However, scholarship still prioritizes international/interregional

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settings (Tinsley & Lynch, 2001; To Minh Chau, 2024; Van Hoa Hoang et al., 2018), leaving intra-provincial collaboration underexamined and under-measured from the enterprise perspective (To Minh Chau, 2024). The effectiveness of intra-provincial tourism linkages is multi-causal, yet rigorous evidence remains scarce at this scale especially in destinations with distinctive potential such as Phu Tho, a midland and mountain province in northern Vietnam increasingly positioned as a regional hub for sustainable tourism. This research examines determinants of linkage effectiveness from the enterprise perspective because: (1) enterprises are direct implementing actors in local tourism (Freeman et al., 2018); (2) their linkage capacity reflects both internal attributes and interactions with the external environment; and (3) effective intra-provincial linkages within a defined resource–spatial context are foundational for local sustainable tourism outcomes. This research seeks to answer the following question: What are the key factors influencing the effectiveness of sustainable tourism linkages among tourism enterprises within the province? The case of Phu Tho contributes to addressing theoretical gaps in local-level tourism linkage studies and provides important empirical evidence to inform sustainable tourism policy based on effective multi-stakeholder collaboration at the intra-provincial scale.

Literature review

The literature indicates two driver groups of tourism-business linkage effectiveness: (i) internal firm factors and (ii) external environmental factors. Internally, managerial capability, cooperative orientation, experience, and resource endowments shape participation and performance (Han & Shah, 2020; To Minh Chau, 2024; Van Hoa Hoang et al., 2018). Competitive Advantage Theory highlights organization and coordination as cores of sustained advantage, while Business Ecosystem Theory stresses endogenous capacity for collaboration (Porter, 1980; Ritchie & Crouch, 2010; Adner, 2017; Moore, 1993). Externally, institutions and policies, resource endowments, infrastructure/technology, and demand conditions shape opportunities for cooperation and value creation (Han & Shah, 2020; Porter, 1980; Ritchie & Crouch, 2010; To Minh Chau, 2024; Van Hoa Hoang et al., 2018). Taken together, these perspectives imply that enabling environments amplify actor interactions and outcomes; recent evidence from Vietnam links cultural natural assets, infrastructure/safety, and policy frameworks to stronger interlocal coordination (Adner, 2017; Han & Shah, 2020; To Minh Chau, 2024). Beyond internal/external drivers, ecosystem and network perspectives highlight contextual contingencies. Firm size shapes resource mobilization, bargaining power, and network centrality; larger firms tend to lead cooperation, while smaller ones show greater dependency. Geographical location (core vs. periphery), service type (accommodation, transport, tour operation), and operational experience influence actors' motivations and capabilities to collaborate. Together, these contingencies condition positionality and the capacity to initiate and sustain relationships within the broader system (Jacobides et al., 2018). In the context of developing intra-provincial tourism linkage networks, the internal capacity of tourism enterprises including managerial capability and existing resources is considered a key factor determining the level of proactiveness, participation, and linkage effectiveness (Baggio et al., 2010; Han & Shah, 2020; Tinsley & Lynch, 2001). According to the Competitive Advantage Theory (Porter, 1980; Ritchie & Crouch, 2010) and the Business Ecosystem Theory (Adner, 2017), enterprises with strong organizational capacity and robust internal resources are more likely to proactively initiate and sustain cooperative relationships (Jacobides et al., 2018). Therefore, in this research, the Internal Enterprise Factors construct is conceptualized as a second-order latent variable, measured by two first-order constructions: Managerial Capacity and Enterprise Resources. This structure aims to comprehensively reflect the intrinsic capacity of tourism enterprises to engage in and develop intra-provincial tourism linkages. The following hypothesis is proposed:

Hypothesis H1: Internal Enterprise Factors, as reflected by (a) managerial capacity and (b) enterprise resources, have a positive impact on the effectiveness of intra-provincial tourism linkages among tourism enterprises.

Grounded in Business Ecosystem and Competitive Advantage theories, linkage effectiveness reflects not only firms' internal capacity but also external conditions policies, infrastructure, resource endowments, and market/demand trends that enable or constrain cooperation (Adner, 2017; Moore, 1993; Porter, 1980; Ritchie & Crouch, 2010; Jacobides et al., 2018). Such environments shape the mechanisms for efficient, sustainable coordination. External factors reduce transaction costs through institutional coherence and infrastructural synergy. Hard infrastructure (facilities, networks) and soft infrastructure (governance, policies) function interdependently. Demand stability and diversity directly enable specialized collaborative services. Destinations with institutional fragility and poor governance face prohibitively high coordination costs,

constraining linkage formation despite strong internal enterprise capabilities (Koshkalda & Riasnianska, 2026; Serruto-Perea, 2024). Therefore, the following research hypothesis is proposed:

Hypothesis H2: External Enterprise Factors, as reflected by (a) local government planning and policies, (b) local tourism resource, (c) tourism infrastructure and supporting facilities, and (d) demand conditions, have a positive impact on the effectiveness of intra-provincial tourism linkages among tourism enterprises.

Firm size shapes roles and capabilities within ecosystems: larger firms typically command greater financial, human, and technological resources and stronger managerial capacity, enabling superior leverage of internal factors (Adner, 2017; Moore, 1993; Goetz et al., 2023; Han & Shah, 2020). This should amplify the effect of internal enterprise factors on linkage effectiveness. Firm size moderates the effect of internal factors through two pathways: resource leverage and strategic positioning. Small enterprises face collaborative resource constraints, amplifying managerial quality's impact (Chamboko-Mpotaringa et al., 2025). Larger enterprises possess resource abundance compensating for management deficiencies (Wang & Butkouskaya, 2025). Therefore, this research proposes the following hypothesis:

Hypothesis H3: The relationship between internal enterprise factors and the effectiveness of intra-provincial tourism linkages varies depending on enterprise size.

Stakeholder Theory posits heterogeneous positions, roles, and motivations across actor groups, shaping how internal capacities are deployed (Freeman et al., 2018; Timur & Getz, 2008). Therefore, the type of enterprise may moderate the relationship by altering how internal enterprise factors influence the effectiveness of intra-provincial tourism linkages. Tourism value chains comprise functionally distinct enterprise types: experience providers, support services, intermediaries, and enabling services. Managerial capacity operationalizes differently across types. Travel intermediaries emphasize relationship coordination; accommodations emphasize operations management. Enterprise type determines dominant value creation form, meaning internal factors prove differentially consequential for linkage effectiveness across heterogeneous actor positions (Almunawar et al., 2026; Peña-Casillas et al., 2024). Based on this reasoning, the following hypothesis is proposed:

Hypothesis H4: The relationship between internal enterprise factors and the effectiveness of intra-provincial tourism linkages varies depending on the type of tourism enterprise.

Operational tenure shapes firms' network positions (Baggio et al., 2010). Longer-established enterprises accumulate managerial experience, partnerships, and resources, enhancing resilience and the effective use of internal capacities. Newly established enterprises face liability of newness; mid-tenure enterprises optimize effectiveness; very mature enterprises decline due to organizational inertia. Crisis resilience evidence reveals that established enterprises with financial reserves-maintained network commitments during COVID-19 disruptions, while new enterprises frequently exited networks (Nguyen et al., 2025; Bekata & Kero, 2024; Thai et al., 2024). Accordingly, the following hypothesis is proposed:

Hypothesis H5: The relationship between internal enterprise factors and the effectiveness of intra-provincial tourism linkages varies according to the number of years of experience in the tourism industry.

Tourism networks are inherently spatial: structure, density, and actor interactions vary with geography and local conditions (Baggio et al., 2010; Ying, 2010). Consequently, the operational area may condition how firms leverage external factors (e.g., infrastructure, market access). Geographic context systematically conditions external factors' efficacy through spatial transaction costs of inter-firm coordination. Dense urban clusters experience automatic linkage formation; dispersed rural destinations require intentional coordination (Thraenhart, 2025; Koshkalda & Riasnianska, 2026). Based on this, the following hypothesis is proposed:

Hypothesis H6: The relationship between external enterprise factors and the effectiveness of intra-provincial tourism linkages varies according to the geographical area of operation.

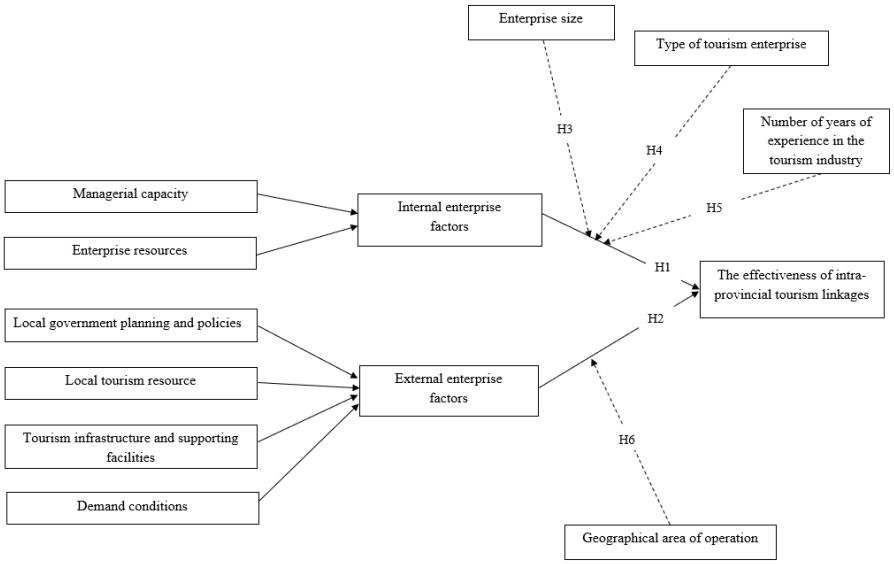

Figure 1: The proposed research model on factors influencing intra-provincial tourism linkages (for tourism enterprises in Phu Tho Province)
Source: Author's proposition, 2025

Methods

Phu Tho is a midland and mountainous province in Northern Vietnam. Strong transport connections make it a transit hub and node for tourism linkages. Cultural assets, the Worship of the Hung Kings and UNESCO recognized Xoan singing and natural resources (Xuan Son National Park, Ao Chau Lagoon, Thanh Thuy hot springs) enable ecotourism, wellness, and nature-based products. Leveraging these advantages, the province has developed intra-provincial offerings (Returning to the Roots, Ancient Village Xoan Singing, Hung Kings Temple by Night; Xuan Son community-based ecotourism) and advanced promotion and community participation. These efforts have contributed to establishing Phu Tho as a key connector within the regional tourism network. The province welcomed approximately 6.753 million tourist arrivals in the first half of 2025 (Phu Tho Department of Culture Sports and Tourism, 2025). These figures reflect a growth trend in the tourism sector, highlighting the effectiveness of development policies, promotional strategies, and efforts to attract visitors.

This research adopted a mixed-methods approach, combining both qualitative and quantitative methodologies to ensure the comprehensiveness and practical relevance of the proposed model (Creswell, 2003). Initially, secondary data were collected from policy documents, tourism statistics of Phu Tho province, and relevant academic studies. Based on prior research and contextual applications in Phu Tho, a set of observed variables was proposed. These variables were subsequently reviewed and refined through consultation with tourism experts to ensure their theoretical robustness and contextual appropriateness. Building on prior studies and Phu Tho's practical context, a preliminary research model was developed through expert consultation. Experts were selected using four criteria: (1) academic qualification of at least a master's degree; (2) ≥5 years of professional experience in tourism; (3) relevant domestic or international publications; and (4) direct experience in managing, coordinating, or training for tourism linkage programs and projects. Snowball sampling was used to identify additional qualified informants. After multiple rounds of consultation and interviews (Google Forms, phone, and in-person), 13 experts meeting all criteria were recruited, and 13 interviews were completed in November 2024. The expert protocol was grounded in the literature review. Based on these inputs, the model comprised two second-order independent latent variables, one dependent variable, and four moderators, with 34 observed indicators. A questionnaire was then constructed with three parts: (i) an introduction and informed consent statement outlining purpose, procedures, and confidentiality/anonymity; (ii) screening questions to ensure eligibility (e.g., firm name, respondent position); and (iii) items assessing factors influencing intra-provincial tourism linkages. All items used a five-point Likert scale from 1 (totally disagree) to 5 (totally agree). To obtain the main results, data were collected from tourism enterprises in Phu Tho using disproportionate stratified sampling between February and April 2025, coinciding with the provincial peak tourist season. The minimum sample size followed Hair et al. (2017), requiring at least ten observations per observed variable (Hair et al., 2017). The survey proceeded in two stages: a pilot survey and the main survey to ensure reliability, feasibility, and instrument adequacy prior to full implementation (Creswell, 2003). The pilot involved a random sample of 30 tourism enterprises in the province to test clarity and robustness. After minor wording adjustments, the finalized questionnaires were administered via mixed modes (in-person, email, and Google Forms), aligned

with operational realities and firms' willingness to participate. Of 420 returned questionnaires, 380 valid responses were retained for analysis (90.4%). The sample included 47 tour operators, 159 accommodation establishments, 87 food and beverage providers, 53 transport firms/households, and 34 other businesses/households (events and ancillary services). Regarding experience, 52.1% reported >5 years in tourism, 26.8% reported 3–5 years, and 21.0% reported <3 years, supporting the sample's suitability and representativeness.

To test the theoretical model and research hypotheses, this research employed the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach using SmartPLS version 4.0 software (Vinzi et al., 2010). PLS-SEM is considered an appropriate technique for exploratory research, theory development, and particularly for complex models and data that do not meet the assumptions of normal distribution (Hair et al., 2017). This approach is especially suitable for emerging research areas and theory-building efforts, such as examining the effectiveness of intra-provincial tourism linkages in the context of Vietnam (Ali et al., 2018). Prior to testing the structural model, the research assessed the measurement model using several key indicators: Cronbach's Alpha and Composite Reliability (CR) to evaluate internal consistency reliability; Average Variance Extracted (AVE) to assess convergent validity; and the Heterotrait–Monotrait Ratio (HTMT) to examine discriminant validity among latent variables (Hair et al., 2017; Henseler et al., 2015). Once the measurement model was validated, the structural model was tested using a bootstrapping technique with 5,000 resamples. The proposed hypotheses were evaluated based on standardized path coefficients (β), statistical significance (t-values), p-values, and the coefficient of determination (R^2), which measures the explanatory power of the independent variables on the dependent variable (Chin, 2010; Hair et al., 2017; Henseler et al., 2015).

Results

Measurement model

Following Hair et al. (2019), we assessed indicator reliability, internal-consistency reliability, convergent validity, and discriminant validity (Hair et al., 2019). All indicators loaded strongly on their intended constructs (outer loadings 0.775–0.893), supporting indicator reliability. Internal consistency was satisfactory (Cronbach's alpha 0.805–0.916; composite reliability, CR, 0.885–0.931). Convergent validity was established with AVE values 0.629–0.773, all above the 0.50 threshold (Fornell & Larcker, 1981).

Table 1: Construct reliability and convergent validity

Construct	Items	Outer loading	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Managerial capacity	MC1 – MC5	0.818 - 0.860	0.892	0.893	0.921	0.699
Enterprise resources	ER1 – ER4	0.824 - 0.842	0.856	0.856	0.902	0.698
Local government planning and policies	PP1 – PP3	0.862 - 0.893	0.853	0.855	0.911	0.773
Local tourism resource	TR1 – TR3	0.848 - 0.855	0.813	0.813	0.889	0.727
Tourism infrastructure and supporting facilities	TI1 – TI3	0.828 - 0.862	0.805	0.805	0.885	0.720
Demand conditions	DC1 – DC4	0.821 - 0.872	0.868	0.869	0.910	0.717
The effectiveness of intra-provincial tourism linkages	EF1 – EF8	0.775 - 0.806	0.916	0.916	0.931	0.629

Source: Author (2025)

The two second-order constructions: Internal Enterprise Factors (IN) and External Enterprise Factors (OUT) were modeled formatively. Examination of outer weights (with corroborating outer loadings) shows that all first-order components contribute positively and significantly to their higher-order constructs ($p < 0.001$), supporting the formative higher-order specification. (Table 2)

Table 2: Outer weights and loadings of first-order constructs on second-order latent variables (IN and OUT)

Causal Relationship	Outer Weight	t-value	p-value	Conclusion
MC -> IN	0.626	48.930	0.000	Supported
ER -> IN	0.474	42.602	0.000	Supported
PP -> OUT	0.288	34.614	0.000	Supported
TR -> OUT	0.261	31.422	0.000	Supported
TI -> OUT	0.259	32.313	0.000	Supported
DC -> OUT	0.365	39.861	0.000	Supported

Source: Author (2025)

Discriminant validity was verified using both the Fornell–Larcker criterion and the HTMT ratio. For every construct, the square root of AVE exceeded its inter-construct correlations, and all HTMT values were < 0.90, indicating no violations (Fornell & Larcker, 1981; Henseler et al., 2015). Collectively, these results demonstrate that the measurement model meets accepted standards of reliability and validity and is suitable for subsequent structural analysis (Table 3, Table 4)

Table 3: Discriminant validity (Fornell-Larcker criterion)

	PP	EF	TI	DC	ER	MC	TR
PP	0.879						
EF	0.56	0.793					
TI	0.652	0.51	0.848				
DC	0.665	0.553	0.649	0.847			
ER	0.27	0.537	0.228	0.207	0.835		
MC	0.238	0.556	0.175	0.2	0.645	0.836	
TR	0.581	0.546	0.613	0.629	0.239	0.21	0.853

Source: Author (2025)

Table 4: Discriminant validity indices of measurement scales Heterotrait-monotrait ratio (HTMT)

	PP	EF	TI	DC	ER	MC	TR
PP							
EF	0.634						
TI	0.785	0.592					
DC	0.772	0.620	0.775				
ER	0.317	0.606	0.274	0.240			
MC	0.273	0.614	0.207	0.227	0.737		
TR	0.697	0.632	0.757	0.748	0.287	0.247	

Source: Author (2025)

Structural model

To assess the structural model, this research examined multicollinearity among constructs by evaluating the Variance Inflation Factor (VIF). The results show that all values were <5, indicating no collinearity concerns (see Table 5).

Table 5: Collinearity statistics (VIF)

	VIF		VIF
DC -> OUT	2.301	OUT -> EF	1.137
ER -> IN	1.712	PP -> OUT	2.172
EXP -> EF	1.031	SIZE -> EF	1.033
EXP x IN -> EF	1.054	SIZE x IN -> EF	1.060
GEO -> EF	1.032	TI -> OUT	2.191
GEO x OUT -> EF	1.015	TR -> OUT	1.935
IN -> EF	1.115	TYPE -> EF	1.020
MC -> IN	1.712	TYPE x IN -> EF	1.060
	R-square	**R-square adjusted**	**Q^2predict**
EF	0.642	0.632	0.620

Source: Author (2025)

Model explanatory and predictive power were strong: $R^2 = 0.642$ for EF (explained by IN and OUT), R^2 adj = 0.632, and Q^2 predict = 0.620, indicating substantial explanation and out-of-sample relevance (Chin, 2010; Hair et al., 2019; see Table 5). These results support a well-specified, practically applicable model for assessing intra-provincial tourism linkage effectiveness. To examine the hypothesized relationships in the structural model, PLS-SEM regression analysis was conducted using the bootstrapping technique with 5,000 resamples. As shown in Table 6, both second-order independent variables Internal Enterprise Factors (IN) and External Enterprise Factors (OUT) exerted a positive and statistically significant influence on the effectiveness of intra-provincial tourism linkages (EF), with path coefficients of $\beta = 0.454$ and $\beta = 0.535$, respectively ($p < 0.001$). These findings confirm the critical role of both internal capabilities and external environmental conditions in fostering effective collaboration among tourism enterprises at the provincial level. Regarding the moderating effects, the results reveal that three of the four qualitative moderating variables significantly influence the relationship between the predictors and linkage effectiveness. Specifically, Enterprise Size (SIZE) positively moderates the relationship between IN and EF ($\beta = 0.091$, $p = 0.005$), and number of years of experience in the Tourism Industry (EXP) shows a strong moderating effect on the same relationship ($\beta = 0.143$, $p < 0.001$). Moreover, the geographical area of operation (GEO) significantly moderates the relationship between OUT and EF ($\beta = 0.093$, $p = 0.001$). Conversely, the type of tourism enterprise (TYPE) does not exhibit a statistically significant moderating effect ($\beta = -0.033$, $p = 0.316$). These findings suggest that contextual factors namely enterprise size, duration of operation, and geographic location play a crucial moderating role in enhancing the effectiveness of intra-provincial tourism linkages. The results provide important implications for developing tailored policies that support sustainable tourism collaboration, particularly in relation to business characteristics and regional contexts.

Table 6: Results of hypothesis testing in the structural model

Hypothesis	Relationship	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Hypothesis Test Result
H1	IN -> EF	0.454	0.454	0.033	13.935	0.000	Supported
H2	OUT -> EF	0.535	0.536	0.032	16.688	0.000	Supported
H3	SIZE x IN -> EF	0.091	0.090	0.033	2.786	0.005	Supported
H4	TYPE x IN -> EF	-0.033	-0.033	0.033	1.003	0.316	Not supported
H5	EXP x IN -> EF	0.143	0.142	0.031	4.600	0.000	Supported
H6	GEO x OUT -> EF	0.093	0.093	0.029	3.203	0.001	Supported

Note: EF: The effectiveness of intra-provincial tourism linkages; IN: Internal enterprise factors; OUT: External enterprise factors; SIZE: Enterprise size; TYPE: Type of tourism enterprise; EXP: Number of years of experience in the tourism industry; GEO: Geographical area of operation.

Source: Author's data analysis results (2025)

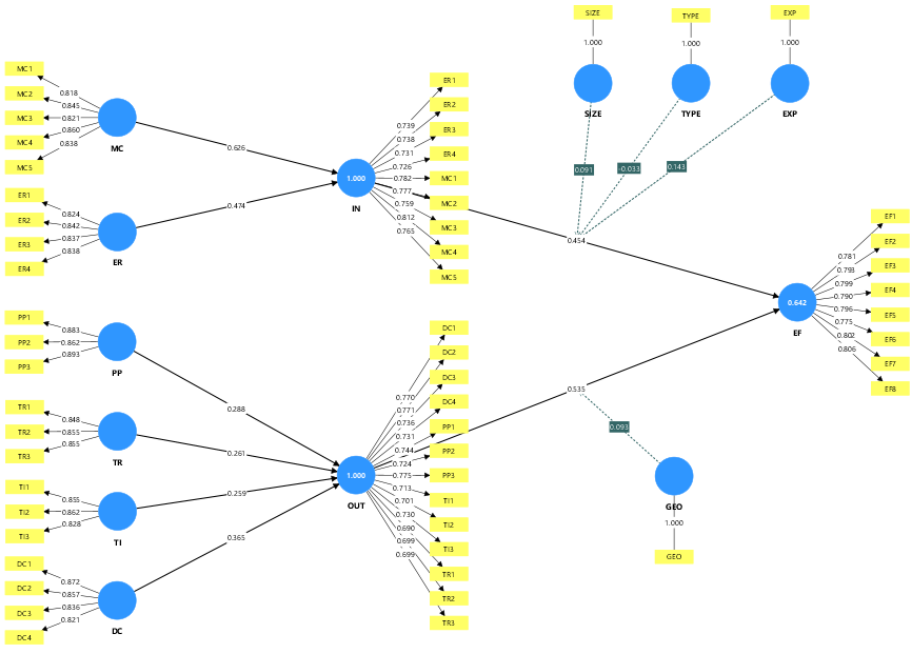

Figure 2: Results of the structural model
Source: Author (2025)

Discussion

The results demonstrate that intra-provincial tourism linkage effectiveness is jointly determined by internal enterprise factors - managerial capacity and enterprise resources and external enterprise factors - local government planning and policies, local tourism resource, tourism infrastructure and supporting facilities, and demand conditions. This configuration is theoretically coherent with Competitive Advantage Theory, Stakeholder Theory, Network Linkage Theory, and Business Ecosystem Theory, which converge on the view that firm capabilities materialize into collaborative outcomes only within enabling institutional and networked environments (Porter, 1980; Ritchie & Crouch, 2010; Freeman et al., 2018; Timur & Getz, 2008; Baggio et al., 2010; Ying, 2010; Adner, 2017; Moore, 1993). The positive, significant effect of internal enterprise factors corroborates evidence that managerial quality, resource endowments, and adaptive routines underpin firms' ability to initiate and sustain cooperative ties and to co-create bundled products (Baggio et al., 2010; Han & Shah, 2020). In line with ecosystem perspectives, enterprises with distinctive assets often achieve advantageous network positions that facilitate coordination and reduce transaction costs (Jacobides et al., 2018). This finding affirms the importance of building capability within firms as a necessary condition for effective linkages. At the same time, the stronger standardized impact of external enterprise factors is consistent with the institutional and spatial context of Phu Tho and aligns with the strand of scholarship emphasizing that policy frameworks, public coordination capacity, infrastructure, and market access frequently operate as binding constraints in emerging destinations (Timur & Getz, 2008; Adner, 2017; Moore, 1993). In Phu Tho, tourism linkage policies are predominantly directional and lack operationalized coordination mechanisms at district and commune levels. The uneven distribution of transport connectivity, digital infrastructure, and visitor flows across the province's hubs: Viet Tri (administrative/MICE), Thanh Thuy (hot-spring wellness), Tan Son (Xuan Son ecotourism/community-based tourism), and Ha Hoa (Ao Chau lagoon) amplifies the marginal returns to place-based public interventions relative to within-firm upgrades. Moreover, on-going administrative restructuring elevates the salience of planning, zoning, and intergovernmental alignment, levers situated outside the firm boundary. These factors jointly explain why the external environment exerts the larger effect on linkage effectiveness.

The moderation pattern further refines these conclusions. The positive moderation by enterprise size and years of experience on the internal-factors effectiveness relationship supports prior arguments that larger and more experienced firms convert managerial capacity and resources into collaborative outcomes more efficiently by virtue of established routines, reputational capital, and broader partner portfolios (Han & Shah, 2020; Goetz et al., 2023; Adner, 2017; Baggio et al., 2010). The moderation by geographical area on the external-factors–effectiveness relationship is consistent with network and spatial analyses showing that the structure and payoffs of cooperation vary with local endowments and infrastructural conditions (Baggio et al., 2010; Ying, 2010). In practical terms, identical policies or investments do not yield uniform effects across hubs; efficacy is mediated by place-specific assets and access. By contrast, enterprise type does not significantly moderate the examined relationships. This divergence from studies positing type-specific

collaboration logics (Freeman et al., 2018; Timur & Getz, 2008) can be attributed to the prevalence of multifunctional small and medium-sized enterprises in Phu Tho. Hybrid business models (e.g., accommodation combined with food and beverage, transport paired with guiding) blur sectoral boundaries, leading firms across types to deploy highly similar capability bundles and to participate in overlapping local networks. Under such conditions, capability tier and network position become more discriminating than sectoral form, yielding statistically comparable slopes across enterprise types. From a methodological standpoint, this interpretation is compatible with the non-significant interaction detected; optional multi-group robustness checks after establishing measurement invariance could further validate this inference.
Taken together, the evidence positions external coordination capacity, and place-based resource activation as the immediate levers for raising linkage effectiveness, while reaffirming that these levers are most productive when complemented by in-firm capability development. This dual emphasis is congruent with ecosystem and stakeholder perspectives, which view sustainable destination outcomes as co-produced by public architecture and private capabilities (Porter, 1980; Ritchie & Crouch, 2010; Freeman et al., 2018; Adner, 2017).

Policy design should be spatially differentiated in accordance with the moderation by geographical area: (i) Viet Tri: institutionalize a destination management function for MICE, open event and capacity data to lower coordination costs; (ii) Thanh Thuy: prioritize water-quality monitoring, service standards, and transport scheduling to lengthen stays and enable cross-selling; (iii) Tan Son (Xuan Son): invest in soft infrastructure (guide training, digital booking and payment pipelines) and conservation co-management to stabilize community-based supply; (iv) Ha Hoa (Ao Chau): improve first–last mile access and wayfinding and pilot lake-based circuits linked to rural gastronomy. Across hubs, establish operational public–private coordination (service-level agreements, shared data standards), a province-wide digital platform for packaging and distribution, and targeted support for SME capability upgrading (management systems, service codification, and analytics). For enterprises, scale capability investments by size and tenure, leveraging experienced firms as anchors to diffuse routines and standards through supplier development and network codification. The study confirms and extends prior research by demonstrating, within a single provincial system, that external, place-sensitive drivers currently dominate internal capabilities in shaping linkage effectiveness, while the structure of multifunctional SMEs neutralizes type-based differences. These insights offer a coherent basis for governance and firm strategy aimed at advancing sustainable intra-provincial tourism development (Baggio et al., 2010; Ying, 2010; Freeman et al., 2018; Timur & Getz, 2008; Adner, 2017; Moore, 1993; Porter, 1980; Ritchie & Crouch, 2010).

Conclusion

This research contributes to clarifying the factors influencing the effectiveness of intra-provincial tourism linkages toward sustainable development by empirically validating a theoretical model using survey data from tourism enterprises in Phu Tho province. The PLS-SEM results indicate that both groups of factors internal enterprise factors (managerial capacity and enterprise resources) and external enterprise factors (local government planning and policies, local tourism resource, tourism infrastructure and supporting facilities, and demand conditions) have a significant positive impact on linkage effectiveness. In addition, enterprise size, geographical area of operation, and years of experience in the tourism industry play a moderating role, while type of tourism enterprise does not exhibit a significant moderating effect. These findings reinforce the applied value of foundational theories such as Competitive Advantage Theory, Stakeholder Theory, and Business Ecosystem Theory in the context of intra-provincial tourism development.
Despite its contributions, this research has several limitations. First, the data collection and analysis were conducted prior to the administrative boundary restructuring of Phu Tho province (effective from July 1, 2025). As a result, some conclusions may no longer fully reflect the expanded geographic and administrative context. Second, the research primarily focuses on the perspective of tourism enterprises within the province and does not comprehensively capture the multi-stakeholder perspectives including those of local authorities, community members, and tourists who also play essential roles in tourism linkage development. Future research could address these limitations by: (1) Expanding the scope of investigation to include a broader range of stakeholders involved in tourism development; (2) Re-testing the proposed model under the newly established geographical and institutional conditions following the administrative merger; and (3) Integrating Social Network Analysis (SNA) with PLS-SEM to provide deeper insights into the structure and dynamics of intra-provincial tourism linkages for sustainable development.

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