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Determinants of Competitive Performance in the Indonesian Freight Forwarding Industry: Integration, Embeddedness, and Innovation

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Abstract: The global logistics industry is transforming operational functions into strategic capabilities to create competitive advantage. However, rapid market growth in Indonesia has not been fully matched by adequate organizational capabilities, leading to the "fragmented capability" phenomenon that hinders firm competitiveness. This study aims to analyze how supply chain integration, digital logistics, and network embeddedness simultaneously influence innovation performance and competitive performance in Indonesian freight forwarding companies. This study employs a quantitative explanatory research design involving 201 respondents in managerial positions, selected through purposive sampling. Data analysis was conducted using a Structural Equation Modeling approach based on Partial Least Squares. The research results show that supply chain integration and network embeddedness significantly improve innovation performance, and that network embeddedness and innovation performance directly enhance competitive performance. Conversely, supply chain integration has no significant direct influence on competitive performance, indicating that its role is more of a supporting capability that must be transformed through innovation. This study concludes that competitive advantage is determined not only by operational integration but by the organization's ability to convert those capabilities into valuable innovations. Companies are advised to prioritize strengthening innovation and strategic partnerships to increase access to market opportunities.

Keywords: Supply Chain Integration, Network Embeddedness, Innovation Performance, Competitiveness Performance, Freight Forwarding.

INTRODUCTION

The global logistics industry has undergone a fundamental transformation from cost-efficiency-based operational functions into strategic capabilities for value creation and corporate competitive advantage. This shift is driven by the increasing complexity of global supply chains, accelerated digitalization, and the demand for service responsiveness and flexibility (Rana et al., 2025; Wang et al., 2024). Globally, the logistics market value reached

approximately USD 3.8 trillion in 2023 and is projected to increase to USD 6 trillion by 2030, with a compound annual growth rate (CAGR) of 7.2% (GRR, 2024). This underscores the logistics sector as a primary pillar supporting international trade and global economic stability.

This massive growth is also evident at the regional level, where the Asia-Pacific region has emerged as a major growth hub, accounting for approximately 35% of the global market. The projected logistics market value in this region is expected to surge from USD 2.22 trillion in 2024 to USD 3.62 trillion by 2033, driven by e-commerce expansion and the adoption of digital technologies (IMARC, 2025). Indonesia, as one of the region's economic powerhouses, exhibits a comparable trajectory, with the logistics sector's value growing from USD 67.8 billion to USD 131.4 billion over the same period (IMARC, 2025). These figures reflect the strategic role of logistics in strengthening national economic competitiveness.

However, this rapid market growth has not been fully accompanied by adequate improvements in organizational capabilities. In the field, serious obstacles persist, including asynchrony between digital systems and physical processes, cargo-handling errors, and weak coordination among supply chain actors. This phenomenon indicates the presence of "fragmented capability," in which supply chain integration, digital logistics, and network embeddedness have not been managed synergistically. Consequently, a gap exists between technology adoption and implementation effectiveness, which hinders innovative performance and overall firm competitiveness.

Theoretically, these capability issues can be analyzed through three primary lenses: the Resource-Based View (RBV), Dynamic Capabilities Theory, and Social Capital Theory. RBV asserts that competitive advantage is rooted in a firm's ability to manage strategic resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). In this context, integration and digitalization. Meanwhile, Dynamic Capabilities Theory emphasizes the importance of organizations continuously reconfiguring these resources to respond to dynamic environmental changes (Teece, 2018; Teece et al., 1997). Complementing these theories, Social Capital Theory explains how network embeddedness provides structural and relational capital that facilitates cross-organizational knowledge flows (Nahapiet & Ghoshal, 1998).

In the logistics context, supply chain integration (SCI) plays a crucial role as an engine for innovation. Internal integration enables real-time information sharing, strengthening organizational learning (Lyu et al., 2022), while external integration fosters adaptive collaboration with suppliers and customers (Ferreira et al., 2021). The consistency of SCI's positive influence on innovation performance has been validated across various countries, including China (Xing et al., 2023; Zhou & Mei, 2025), Pakistan (Hassan et al., 2023), and Vietnam (Duong & Ha, 2021). Furthermore, SCI represents a strategic capability that directly shapes competitive performance. Through information integration and strategic collaboration, firms can enhance operational agility and efficiency, which underpin competitiveness (Hassan et al., 2023; Zu'bi et al., 2015).

Similar to SCI, network embeddedness plays a pivotal role in providing access to external resources and knowledge (Tian et al., 2021). Strong network ties facilitate innovative performance by expanding access to new ideas and technologies (Li & Liu, 2023; Pomegbe et al., 2020). Simultaneously, network embeddedness strengthens competitive performance through the mechanisms of sensing, seizing, and reconfiguring market opportunities (Teece, 2018). Empirical research indicates that stronger structural and relational ties contribute significantly to competitive advantage through knowledge integration and cross-organizational collaboration (Andersen et al., 2023; Bai et al., 2025; Soniewicki & Hauke-Lopes, 2025).

Furthermore, there is a close interlinkage in which innovative performance serves as a primary driver of competitive performance. Innovation allows firms to adapt to environmental changes, improve distribution efficiency, and create value differentiation (Mikalef & Pateli, 2017; Wasik et al., 2023). Studies across various sectors demonstrate that product and process innovations act as catalysts, transforming organizational capabilities into sustainable

competitive advantage (Baah et al., 2023; Ferreira et al., 2021). In Indonesia, supply chain innovation has been proven to enhance competitiveness despite resource limitations (Yuswantoro et al., 2022).

Despite the extensive research on these variables, current literature exhibits several fundamental limitations. Most studies examine supply chain integration and network embeddedness in isolation, thereby failing to explain how these two capabilities interact to shape organizational performance (Bai et al., 2025; Mailani et al., 2024). Additionally, previous research has generally not adopted a capability configuration perspective, which views various capabilities as an integrated system. Moreover, empirical evidence in the Indonesian freight forwarding industry remains limited, even though its fragmented industry structure demands a more contextual approach.

Based on these gaps, this study offers three primary contributions. First, it develops an integrative model that simultaneously tests the roles of supply chain integration, digital logistics, and network embeddedness on innovation performance and competitiveness performance. Second, this study adopts a capability configuration perspective, emphasizing that competitive advantage arises from the interaction among various organizational capabilities rather than the partial influence of individual variables. Third, this research makes a contextual contribution in the Indonesian setting, particularly in the freight forwarding industry, which is characterized by capability gaps and uneven digital maturity.

Based on these arguments, this study aims to analyze how supply chain integration, digital logistics, and network embeddedness simultaneously influence innovation performance and competitiveness performance in Indonesian freight forwarding companies.

METHOD

This study employs a quantitative, explanatory research design. The primary objective of this design is to examine the relationships between constructs derived from theoretical foundations and to evaluate the influence of supply chain integration, digital logistics, and network embeddedness on organizational performance. Through this approach, the researcher aims to explain the patterns of causality and the significance of the relationships between the variables under study.

The research population encompasses all freight forwarding companies operating in Indonesia. The unit of analysis is established at the organizational level, with respondents drawn from managerial positions. The selection of these respondents is based on the assumption that managers possess a comprehensive understanding of supply chain operations and hold the authority to make strategic decisions.

The sampling technique used is purposive, based on specific criteria: respondents with in-depth experience and knowledge of supply chain integration, digital logistics systems, and inter-organizational collaboration. To determine sample adequacy, this study employs a statistical power analysis approach using G*Power software (Hair Jr et al., 2022). Based on these calculations, the minimum sample size was set at 201 respondents to ensure sufficient statistical power for testing the research model. Data were collected by distributing a structured questionnaire to companies that met the sampling criteria.

All variables in this study are measured using a five-point Likert scale to capture respondents' perceptions with precision. The operationalization of variables is divided into two categories of measurement models:

1. Higher-Order Constructs (Reflective-Formative)

- a. Supply Chain Integration (SCI): Operationalized through internal integration and customer integration dimensions to measure the level of coordination and information exchange (Ganbold et al., 2020).

- b. Network Embeddedness: Measured through structural and relational dimensions, reflecting the intensity of network relationships and the level of trust between partners (Xing et al., 2023).

2. Lower-Order Constructs (Reflective)

- a. Innovation Performance: Reflects the company's ability to develop and implement new ideas, processes, and services (Baah et al., 2023)
- b. Competitiveness Performance: Indicates the organization's ability to achieve superior operational performance and market positioning (Mikalef & Pateli, 2017).

Data analysis is conducted using the Structural Equation Modeling (SEM) approach based on Partial Least Squares (PLS). This method was selected for its capability to analyze complex relationships between latent variables and its superiority in predictive research models.

The analysis procedure is divided into two primary stages. First, the outer model is evaluated to ensure construct reliability and validity through tests of internal consistency, convergent validity, and discriminant validity. Second, the evaluation of the inner model is performed to test the relationships between variables and to provide empirical evidence for the proposed research hypotheses.

RESULTS AND DISCUSSION

Respondent Profile and Organizational Characteristics

Based on the data collected from 201 respondents who met the purposive sampling criteria, the demographic analysis indicates a robust representation of decision-makers within the freight forwarding industry. A summary of the respondent characteristics is presented in Table 1.

Table 1. Respondent Profile (n=201)

Demografi	n	%
Gender		
Male	150	75%
Female	51	25%
Total	201	100%
Position		
CEO	47	23%
Director	134	67%
Manager	20	10%
Total	201	100%
Work Experience (Years)		
< 5	30	15%
6 – 15	150	75%
> 15	21	10%
Total	201	100%
Company Size		
Small	20	10%
Medium	70	35%
Large	111	55%
Total	201	100%

Source: Primary Data Analysis (2026)

Based on the data collected from 201 respondents who met the purposive sampling criteria, the demographic analysis indicates a robust representation of decision-makers within the freight forwarding industry.

A summary of the respondent characteristics is presented in Table 1. Regarding gender, the majority of respondents are male (150, 75%), while females account for 51 (25%). This

composition reflects the demographic landscape of the managerial workforce in the logistics sector, which remains predominantly male.

In terms of professional positions, the sample is dominated by top and middle management, specifically Directors (67%), CEOs (23%), and Managers (10%). This distribution indicates that the majority of respondents possess strategic authority in decision-making, thereby enhancing the credibility and validity of the data obtained for this study.

From the perspective of work experience, most respondents have a high level of professional tenure, with 75% having served 6 to 15 years and 10% exceeding 15 years. Conversely, only 15% of respondents have less than 5 years of experience. This suggests that the gathered data originates from seasoned practitioners with an in-depth understanding of the dynamics within the logistics industry.

Furthermore, by company size, the respondents represent a range of business scales, predominantly large enterprises (55%), followed by medium-sized companies (35%) and small enterprises (10%). This distribution demonstrates that the study encompasses a wide range of organizational contexts, enabling a more comprehensive analysis of the implementation of supply chain integration, digital logistics, and network embeddedness.

Outer Model - Lower-Order (Reflective-Reflective)

The evaluation of the lower-order measurement model was conducted to ensure that all indicators possess adequate reliability and validity in reflecting the constructs they measure. The assessment was based on factor loading (FL), Average Variance Extracted (AVE), Cronbach’s Alpha (CA), and Composite Reliability (CR) values (Hair Jr et al., 2022).

Table 2. Pengukuran Variabel

Variable	Dimension	Item	FL	AVE	CA	CR					
Supply Chain Integration	Customer integration	CI1	0.759	0.583	0.880	0.907					
		CI2	0.771								
		CI3	0.729								
		CI4	0.827								
		CI5	0.763								
		CI6	0.728								
		CI7	0.762								
	Internal integration	II1	0.813	0.636	0.856	0.897					
		II2	0.762								
		II3	0.858								
		II4	0.786								
		II5	0.763								
		Network Embeddedness	Structural				NE1	0.815	0.668	0.833	0.889
							NE2	0.781			
NE3	0.800										
NE4	0.869										
Relational	NE5		0.873	0.787	0.910	0.937					
	NE6		0.918								
	NE7		0.886								
	NE8		0.871								
Competitiveness Performance		CP1	0.710	0.506	0.891	0.911					
		CP2	0.768								
		CP3	0.751								
		CP4	0.738								
		CP5	0.706								
		CP6	0.684								
		CP7	0.708								
		CP8	0.747								
		CP9	0.672								
		CP10	0.616								

Variable	Dimension	Item	FL	AVE	CA	CR
Performance Innovation		IP1	0.756	0.563	0.806	0.865
		IP2	0.754			
		IP3	0.761			
		IP4	0.782			
		IP5	0.696			

Source: Primary Data Analysis (2026)

The outer model analysis results reveal that the majority of indicators have factor loadings exceeding 0.70, confirming each indicator’s significant contribution to its respective construct. Within the SCI construct, both the customer integration and internal integration dimensions exhibit strong loading values (0.728–0.858). A similar trend is observed in the network embeddedness construct, where the structural and relational dimensions range from 0.781 to 0.908. The notably strong measurement power of the relational dimension underscores the critical importance of trust and relationship quality within the firm’s business network.

Although several indicators exhibited loading values below 0.70, specifically competitiveness performance (CP10 = 0.616) and innovation performance (IP5 = 0.696), they were retained in the model. This decision was justified by the AVE values meeting the required threshold (> 0.50), and both CA and CR exceeding 0.70 (Hair Jr et al., 2022). This demonstrates that the reliability and validity of the constructs remain intact despite the lower contribution of these specific indicators.

Overall, the convergent validity testing yielded satisfactory results, with AVE values ranging from 0.506 to 0.787 for all constructs. This achievement indicates that each construct can explain more than 50% of the variance in its indicators. In terms of reliability, all constructs demonstrated high internal consistency, with CA values (0.806–0.910) and CR values (0.865–0.937) meeting conservative criteria. Based on the results of this first-order measurement model evaluation, all constructs are declared valid and reliable, making them suitable for subsequent structural model testing.

Outer Model - Higher-Order (Reflective-Formative)

The evaluation of the second-order measurement model was conducted to examine the validity of the reflective-formative constructs by analyzing the relationship between the lower-order constructs (LOC) and the higher-order constructs (HOC). The assessment focused on two primary aspects: the level of collinearity assessed via VIF values, and the significance and relevance of the indicators evaluated through outer weights.

Table 3. Measurement of Higher-Order Variables (Reflective-Formative)

HOC	LOC	FL	VIF	Outer Weight	T stats	P values
Supply Chain Integration	Customer integration	0.973	1.872	0.756	5.318	0.000
	Internal integration	0.834	1.872	0.317	1.993	0.046
Network Embeddedness	Relational	0.944	2.212	0.580	3.793	0.000
	Structural	0.921	2.212	0.491	3.076	0.002

Source: Primary Data Analysis (2026)

The test results indicate that all second-order dimensions exhibit VIF values well below the critical threshold of 5.0 (and even below 3.3). This finding confirms the absence of multicollinearity among the dimensions, ensuring that each contributes unique information to its respective higher-order construct.

The evaluation of indicator weights (outer weights) demonstrates that all dimensions provide a statistically significant contribution ($p < 0.05$) to the formation of the HOC:

- A. Supply Chain Integration: The customer integration dimension emerges as the primary contributor with an outer weight of 0.756 ($t = 5.318$; $p = 0.000$). Meanwhile, internal

integration also provides a significant contribution with a weight of 0.317 ($t = 1.993$; $p = 0.046$). Although the weight for internal integration is lower, its significance remains within the $\alpha = 5\%$ threshold.

B. Network Embeddedness: This construct is significantly shaped by the relational dimension, with a weight of 0.580 ($t = 3.793$; $p = 0.000$) and the Structural dimension, with a weight of 0.491 ($t = 3.076$; $p = 0.002$). This indicates that both relationship quality and network structure play proportionally vital roles in representing the firm's network embeddedness.

In summary, all LOC dimensions in this model exhibit exceptionally high loadings (FL) (> 0.80) and significant outer weights. These findings confirm that Supply Chain Integration and Network Embeddedness are validly defined by their constituent dimensions through a reflective-formative approach. Having met the criteria for first-stage validity and reliability, as well as second-stage formative validity, this model is deemed suitable for further structural model testing (the inner model).

Discriminant Validity

Discriminant validity testing in this study was conducted using the Heterotrait-Monotrait Ratio (HTMT) criterion. This method was selected due to its superior capability and accuracy in detecting discriminant validity issues compared to traditional methods, such as the Fornell-Larcker criterion or cross-loadings (Henseler et al., 2015).

Table 3. Heterotrait-Monotrait Ratio

	CP	CI	II	PI	REL	STR
Competitiveness Performance						
Customer integration	0.520					
Internal integration	0.497	0.778				
Performance Innovation	0.615	0.697	0.565			
Relational	0.543	0.513	0.487	0.500		
Structural	0.531	0.529	0.452	0.537	0.850	

Source: Primary Data Analysis (2026)

As shown in Table 3, all HTMT values in this research model meet the required threshold ($\leq 0,85$). Consequently, discriminant validity has been established, indicating that each latent construct in this study possesses unique empirical properties and can capture phenomena not captured by other constructs within the model.

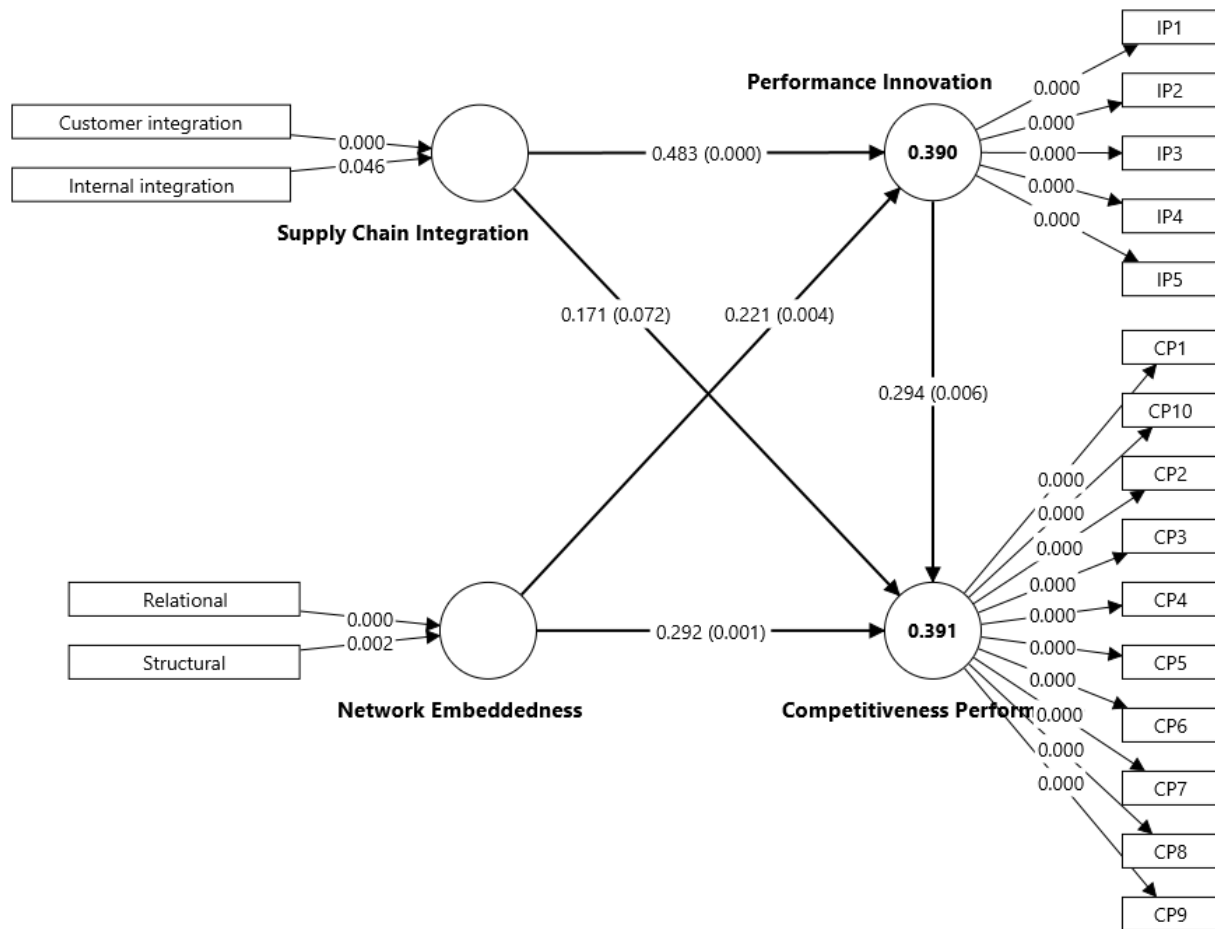
Inner Model

The assessment of the structural model was conducted using the PLS-SEM approach, with path coefficients, t-statistics, and p-values analyzed. Additionally, the VIF values were examined to ensure there was no multicollinearity in the model.

Table 4. Inner Model

Path	VIF	STD	STDEV	T states	P values	Decison
Supply Chain Integration→Performance Innovation	1.347	0.483	0.093	5.216	0.000	Accepted
Network Embeddedness→Performance Innovation	1.347	0.221	0.076	2.900	0.004	Accepted
Network Embeddedness→Competitiveness Performance	1.427	0.292	0.089	3.286	0.001	Accepted
Performance Innovation→Competitiveness Performance	1.639	0.294	0.107	2.751	0.006	Accepted
Supply Chain Integration→Competitiveness Performance	1.729	0.171	0.095	1.800	0.072	Rejected

Source: Primary Data Analysis (2026)



Source: Research Results
Figure 1. Inner Model

As shown in Table 4, all VIF values are below the threshold of 5 (ranging from 1.347 to 1.729), indicating that there are no multicollinearity issues among the constructs in the structural model. Consequently, the model is deemed suitable for hypothesis testing.

Overall, the testing results indicate that the majority of the hypotheses in this study are empirically supported, except for one non-significant relationship. First, the influence of supply chain integration on innovation performance is significant, with a path coefficient of 0.483, a t-statistic of 5.216, and a p-value < 0.001. This result suggests that greater supply chain integration increases the firm’s innovation capability; thus, H1 is supported. Second, network embeddedness also significantly affects innovation performance, with a coefficient of 0.221, a t-statistic of 2.900, and a p-value of 0.004. This indicates that a firm’s embeddedness in business networks enhances innovative performance, thereby supporting H2.

Third, the impact of network embeddedness on competitiveness performance is also significant, showing a coefficient of 0.292, a t-statistic of 3.286, and a p-value of 0.001. This finding implies that strong network relationships directly enhance a company’s competitiveness; therefore, H3 is supported. Fourth, innovation performance is proven to have a significant influence on competitiveness performance, with a coefficient of 0.294, a t-statistic of 2.751, and a p-value of 0.006. This result demonstrates that innovation is a vital mechanism for increasing corporate competitiveness, supporting H4.

However, the direct effect of supply chain integration on competitiveness performance is non-significant, with a coefficient of 0.171, a t-statistic of 1.800, and a p-value of 0.072. As this value exceeds the 0.05 significance threshold, H5 is rejected. This finding suggests that supply

chain integration does not automatically improve competitiveness, but rather likely operates through other mechanisms, such as enhancing innovation performance.

Model’s explanatory power

The subsequent evaluation of the structural model is performed by analyzing the R^2 (*R-Square*) and f^2 (*effect size*) values to assess the model's explanatory power and the respective contributions of each independent variable to the dependent variables.

Table 5. R-Square dan F-Square

	R-Square	F-Square
Supply Chain Integration→Performance Innovation	0.390	0.283
Network Embeddedness→Performance Innovation		0.059
Network Embeddedness→Competitiveness Performance	0.391	0.098
Performance Innovation→Competitiveness Performance		0.086
Supply Chain Integration→Competitiveness Performance		0.028

Source: Primary Data Analysis (2026)

Based on Table 5, the R^2 value for innovation performance is 0.390, indicating that supply chain integration and network embeddedness collectively account for 39.0% of the variance in innovation performance. Furthermore, the R^2 value for competitiveness performance is 0.391, meaning that the combination of network embeddedness, innovation performance, and supply chain integration explains 39.1% of the variance in corporate competitiveness.

Regarding the individual contributions of each variable, the effect size (f^2) analysis reveals variations in influence across the constructs. Supply chain integration has a substantial impact on innovation performance, with an f^2 value of 0.283, indicating a medium-to-large effect. This underscores that supply chain integration is a primary driver in enhancing the firm's innovation performance. In contrast, network embeddedness has a minor influence on innovation performance with an f^2 value of 0.059, which is classified as a small effect. Nevertheless, this influence remains significant, indicating that network embeddedness serves as a supporting factor within the innovation process.

For competitiveness performance, network embeddedness shows an f^2 value of 0.098, while innovation performance yields an f^2 of 0.086. Both values fall within the small effect category, suggesting that these two variables make a relatively balanced contribution to improving corporate competitiveness.

Meanwhile, supply chain integration recorded an f^2 value of only 0.028 toward competitiveness performance, representing a very small effect. This finding is consistent with previous hypothesis-testing results, which indicated that the direct influence of supply chain integration on competitiveness is not significant.

PLSpredict

The model's predictive relevance was evaluated using the PLSpredict approach. This involved comparing the $Q^2_{predict}$ values and prediction errors between the PLS-SEM model and the linear model (LM) benchmark, specifically using the Mean Absolute Error (MAE) (Hair Jr, 2021; Shmueli et al., 2019).

Table 6. PLSpredict

Item	$Q^2_{predict}$	MAE		
		PLS-SEM	LM	PLS-SEM < LM
IP1	0.191	0.473	0.485	-0.012
IP2	0.175	0.454	0.462	-0.008
IP3	0.205	0.464	0.466	-0.002
IP4	0.263	0.475	0.486	-0.011
IP5	0.143	0.435	0.439	-0.004
CP1	0.132	0.455	0.461	-0.006

Item	$Q^2_{predict}$	MAE		
		PLS-SEM	LM	PLS-SEM < LM
CP2	0.171	0.384	0.388	-0.004
CP3	0.234	0.456	0.460	-0.004
CP4	0.116	0.410	0.410	0.000
CP5	0.138	0.480	0.487	-0.007
CP6	0.094	0.429	0.433	-0.004
CP7	0.136	0.433	0.434	-0.001
CP8	0.144	0.446	0.451	-0.005
CP9	0.149	0.402	0.408	-0.006
CP10	0.155	0.517	0.518	-0.001

Source: Primary Data Analysis (2026)

The analysis results indicate that all indicators have positive $Q^2_{predict}$ values, ranging from 0.094 to 0.263, across both the innovation and competitiveness constructs. These positive values demonstrate that the model has strong predictive capability, as it produces more accurate predictions than the simple average (naïve benchmark).

Furthermore, a comparison of MAE values between the PLS-SEM and LM models reveals that nearly all indicators exhibit lower MAEs in the PLS-SEM model (indicated by negative differences). This indicates that the PLS-SEM model produces smaller prediction errors than the linear model, thereby demonstrating superior predictive power compared to conventional linear regression approaches.

Specifically, for the innovation performance construct (IP1–IP5), all indicators demonstrate consistent predictive performance, with negative MAE differences ranging from -0.002 to -0.012. This confirms the model's ability to predict innovation performance accurately. Similarly, for the competitiveness performance construct (CP1–CP10), almost all indicators recorded lower MAE values in the PLS-SEM model. While one indicator (CP4) showed identical error rates (0.000) between the two models, the overall model maintains its predictive superiority.

Based on PLSpredict criteria, when the majority of indicators exhibit positive $Q^2_{predict}$ values and the PLS-SEM model's prediction errors are lower than those of the benchmark model, the model is categorized as having robust medium-to-high predictive relevance.

Discussion

The results of this study indicate that supply chain integration (SCI) has a positive and significant influence on innovation performance. This finding implies that robust integration between internal and external functions enables firms to enhance information flow, strengthen coordination, and accelerate innovation. Effective supply chain integration fosters cross-organizational collaboration, which ultimately boosts a firm's innovative capabilities. This is consistent with prior research suggesting that collaboration across the supply chain contributes to improvements in both product and process innovation (Baah et al., 2023; Duong & Ha, 2021; Hassan et al., 2023). Furthermore, the utilization of technologies such as Enterprise Resource Planning (ERP) and cloud-based supply chain analytics accelerates information exchange and supports large-scale innovation (Tian et al., 2024). Theoretically, this finding reinforces Dynamic Capabilities Theory, which emphasizes that cross-organizational integration enhances innovative capacity and organizational agility in responding to environmental changes (Teece, 2018).

In the context of national firms, despite technological and resource constraints, supply chain integration remains vital in driving innovation through local collaboration and long-term business relationships. This finding aligns with studies showing that operational coordination and strong supply chain ties can generate incremental innovation (Mailani et al., 2024; Rahmasari, 2019; Zainurrafiqi & Gazali, 2024). Additionally, internal integration proved more

dominant than external integration in driving innovation, particularly in developing countries still facing hurdles to technology adoption (Duong & Ha, 2021). This strengthens the RBV perspective that internal integration capabilities are valuable and difficult to imitate.

Furthermore, network embeddedness was found to have a positive and significant effect on innovation performance. A firm's embeddedness within business networks facilitates access to external resources, cross-organizational knowledge exchange, and innovative collaboration. This finding aligns with research highlighting the critical role of network ties in enhancing innovation and corporate growth (Andersen et al., 2023; Boxu et al., 2022; Soniewicki & Hauke-Lopes, 2025).

However, the results show that supply chain integration does not have a significant direct effect on competitiveness performance. This suggests that supply chain integration does not automatically translate into increased competitiveness; rather, it requires a specific transformation mechanism. While some studies suggest that integration can improve competitive performance through efficiency and coordination (Duong & Ha, 2021; Hassan et al., 2023; Zu'bi et al., 2015), this study indicates that such an effect does not occur directly. Consequently, this finding implies that supply chain integration serves more as an enabling capability than as a direct source of competitive advantage.

Conversely, network embeddedness exerts a positive and significant influence on competitiveness performance. This demonstrates that embeddedness in business networks enables firms to enhance competitiveness through access to strategic resources, cross-organizational collaboration, and knowledge exchange. This is consistent with research showing that the strength of relationships within a business network determines a firm's ability to create a competitive advantage (Li & Liu, 2023; Tian et al., 2021; Xing et al., 2023).

Moreover, innovation performance was shown to have a positive and significant impact on competitiveness. This finding affirms that innovation is the primary mechanism for transforming organizational capabilities into a competitive advantage. Firms capable of producing product and process innovations possess a superior ability to enhance efficiency, differentiate services, and respond to market dynamics. This result aligns with previous studies identifying innovation as a key factor in boosting corporate competitiveness (Ferreira et al., 2021; Mikalef & Pateli, 2017; Wasik et al., 2023). Additionally, IT-based innovation has been shown to improve operational efficiency and competitive advantage across various industrial sectors (Padilla-Lozano & Collazzo, 2021; Yildiz Çankaya & Sezen, 2018).

In summary, the results of this study exhibit a consistent pattern: supply chain integration and network embeddedness serve as strategic capabilities that drive innovation performance, while innovation performance and network embeddedness directly enhance competitiveness. These findings emphasize that competitive advantage is determined not only by operational integration but also by a firm's ability to manage its networks and transform those capabilities into value-added innovations.

Research Novelty

This study provides several novel contributions to the literature on supply chain management and organizational performance:

1. **Capability Configuration Approach:** This research proposes a holistic configuration approach by integrating supply chain integration, digital logistics, and network embeddedness into a single, unified conceptual model. This transcends the fragmented or partial approaches that have dominated previous studies.
2. **The Indirect Path to Competitiveness:** The study demonstrates that supply chain integration does not directly enhance competitiveness; instead, it serves as a foundational capability that must be translated into innovation performance. This enriches the Dynamic Capabilities framework by clarifying that competitive advantage stems not from the capability itself, but from the organization's ability to convert it into valuable innovation.

3. Contextual Contribution (Indonesia): This research offers critical empirical insights from the Indonesian freight forwarding industry, characterized by "fragmented capabilities" and uneven digital maturity. This provides highly relevant insights into the dynamics of logistics in developing economies.

CONCLUSION

This study aims to analyze the influence of supply chain integration, network embeddedness, and innovation performance on competitiveness among freight forwarding companies in Indonesia. The results indicate that supply chain integration and network embeddedness play a significant role in enhancing innovation performance, and that network embeddedness and innovation performance directly increase competitiveness. Conversely, supply chain integration does not have a significant direct influence on competitiveness, suggesting that its role is more a supporting capability that must be transformed through innovation to generate a competitive advantage.

From a theoretical perspective, this study strengthens the frameworks of Dynamic Capabilities Theory and the RBV by demonstrating that competitive advantage is determined not only by the possession of strategic capabilities but also by an organization's ability to convert those capabilities into valuable innovation. Furthermore, this research adopts a capability configuration approach, emphasizing the simultaneous interaction among supply chain integration, network embeddedness, and innovation performance in shaping organizational performance. The finding that network embeddedness directly influences competitiveness also enriches the social capital literature in the supply chain context.

The results of this study imply that freight forwarding companies should prioritize strengthening innovation as the primary mechanism for enhancing competitiveness. Supply chain integration should not only focus on operational efficiency but also support innovative collaboration and knowledge exchange. Additionally, strengthening business networks through strategic partnerships and the use of digital platforms is a key factor in increasing access to external resources and innovation opportunities.

Despite its contributions, this study has several limitations. First, it employs a cross-sectional approach, which cannot capture the dynamics of changes in firm capabilities and performance over the long term. Second, this research focuses specifically on the Indonesian freight forwarding industry; therefore, generalizing the results to other sectors or countries should be approached with caution. Third, the use of perception-based variable measurement is susceptible to subjectivity bias..

Given these limitations, future research is encouraged to use a longitudinal approach to capture the dynamics of relationships between variables more comprehensively. Furthermore, future studies could expand the research context to other industrial sectors or conduct cross-country comparisons to test the model's consistency. Future research could also expand the model by incorporating additional variables, such as digital maturity, organizational agility, and knowledge management, to deepen understanding of the mechanisms for establishing competitive advantage in the digital era.

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