

# Uncertain Supply Chain Management

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## Developing models of environment uncertainty, incoterms on strategic alliance and competitive advantage

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### ABSTRACT

#### Article history:

Received September 22, 2023  
Received in revised format  
October 20, 2023  
Accepted December 1 2023  
Available online  
December 1 2023

#### Keywords:

Competitive advantage  
Environmental uncertainty  
Freight Forwarders Incoterm  
Strategic alliance

This study aims to analyze the impact of environmental uncertainty and Incoterm on strategic alliances and competitive advantage in the Freight Forwarder Industry in Indonesia. The measuring method examines how variables, including environmental uncertainty, Incoterm, and strategic alliances, affect competitive advantage using SmartPLS technology and structural equation modeling (SEM) analysis. The questionnaire was created using a 5-point Likert scale. Through a simple random selection procedure, study participants selected freight forwarder companies. Validity, reliability, and significance tests—often along with hypothesis testing—are all included in the sequential data analysis. The study has identified the following relationships based on an evaluation of the data processing: Strategic alliances are positively impacted by environmental uncertainty, Incoterm is positively affected by environmental uncertainty, Incoterm is positively influenced by competitive advantage, and strategic alliances are positively affected by competitive advantage. The novelty of this study is the influence of environmental uncertainty and Incoterm on Strategic alliance and competitive advantage in the Freight Forwarder Industry in Indonesia. The theoretical implication supports previous theories on environmental uncertainty and Incoterm to increase competitive advantage through strategic alliances. The practical implication is for the management of a Freight forwarding company to scan the uncertainty of the logistics environment and implement the selection of the right Incoterm to encourage strategic alliances to encourage competitive advantage. This research makes a significant contribution to the advancement of scientific principles, particularly within the field of strategic management. Furthermore, it provides a valuable reference and comparative material for future studies focusing on the impact of environmental uncertainty and Incoterm on strategic alliances and competitive advantage within the freight forwarder industry in Indonesia.

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### 1. Introduction

The global business environment has changed fiercely (Qing et al., 2022). Companies are trying to find the right way to adapt because such an environment threatens business sustainability. The business must adapt to changes in its external environment to seek sustained growth. The uncertainty of the business environment is a reality that modern companies have to face. While changing market dynamics, companies must be prepared to face various challenges. Variables, including economic volatility, regulatory changes, and consumer patterns, can strongly impact an organization's performance and long-term goals. Companies understand that implementing unique and new tactics is the only way to preserve and increase competitiveness (Troise et al., 2022). Performance is essential to the sustainability of the business, and if it improves, it has the potential to take the lead globally (Waiyawuththanapoom et al., 2023). In this context, the primary challenge lies in how businesses can adapt and leverage their competitive advantages in response to the uncertainties present in the business environment.

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ISSN 2291-6830 (Online) - ISSN 2291-6822 (Print)

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doi: 10.5267/j.uscm.2023.12.001

Supply chain management is essential for facilitating businesses to compete effectively and meet the demands of modern markets. Supply chain management is crucial for domestic operations and managing international suppliers, distribution, and needs (Hosseinnia Shavaki & Ebrahimi Ghahnavieh, 2022). The competition is getting tougher because companies compete to provide innovative and reliable logistics solutions. Competition is a natural and inevitable thing in business, so companies must find ways to win the competition. Corporate competition has transitioned to supply chain-level competition (Koç et al., 2022). Companies must reorganize their strategy and logistics system to face global competition (Naway & Rahmat, 2019). As part of the logistics and supply chain, Freight forwarders must also be able to adapt to environmental uncertainty. According to Fulop et al. (2021), Freight forwarders must optimize their international transportation operations while cutting costs due to rising market competitiveness and globalization.

Businesses must be able to delve deep and identify competitive advantages to compete with their rivals in today's more harsh business environment. Customers will choose a Freight forwarder with specialized services based on the degree of service, competitive price, technology, networking, and regulatory experience (Mohsen and Mohsen, 2023). However, many Freight forwarder companies have not yet found their competitive advantage. As a result, they are confused when competing with companies with competitive advantages, a broader international network, superior service, and strong capital. In addition, the main problem in the Freight forwarder industry is that new entrants easily imitate their business model. Indeed, maintaining a distinct competitive advantage through constant innovation can be a challenging task. According to the resource-based view of a company's competitive advantage, the main characteristics of resources that contribute to sustained competitive advantage are that they must be valuable, rare, inimitable, and non-substitutable (Barney, 2001). Companies must pay attention to environmental uncertainty in business competition because it can affect their strategic decisions, such as new product development, market expansion, investment, or resource use. Overall, environmental uncertainty significantly impacts business competition and corporate sustainability. Therefore, companies must pay close attention and respond to such uncertainty to make the right strategic decisions and remain competitive in a rapidly changing market (Koç et al., 2022; Mastika et al., 2023; Sugiono et al., 2022). Companies must be careful when choosing Incoterm (International Commercial Terms) in business competition because Incoterm is an international rule that regulates obligations and responsibilities between sellers and buyers in international trade transactions (Davis and Vogt 2022). Choosing the right Incoterm can provide advantages and certainty in business competition. Freight forwarder companies must be able to select the right Incoterm in negotiations with prospective customers. It will be a problem if the Freight forwarder chooses prospective customers who are not following the selection of the right Incoterm because it can be wrong in segmentation and targeting customers.

Another problem in the Freight forwarder industry is the weak international network. This requires companies to be open and have an orientation to make alliances with forwarding in other countries. The strategic alliance will be able to bring companies risk sharing, common market access, and improve skills and technology (Emami et al., 2022). Achievable strategic decisions that take into account ambidexterity, partnerships, mergers, and acquisitions result in links at the company level and workable solutions (Cho and Lee, 2020; Emami et al., 2022). Strategic alliances are advantageous for business, and substantial evidence shows they can influence the outcome of significant conflicts. The capacity to create successful coalitions may represent the difference between a gain and a loss. The flexibility of business structures and partnerships can increase trust and provide fresh business perspectives (Wall, 2022). The resource-based perspective found that reputation as a resource is significant because it grants small enterprises access to worldwide resources and a large network of partners, which can ultimately help them gain a competitive advantage. Through alliances, larger businesses can offer clients innovation without investing in more resources or personnel (Jyoti & Efraxia, 2023). It can be not easy to consistently innovate to establish and sustain a distinct competitive advantage (**Pombo & Franco, 2023**). However, the alliance's partners' communication channels need to be adaptable enough to change as the alliance goes through different phases (Jatobá et al., 2023).

While the literature has explored environmental uncertainty, Incoterm, alliance strategy, and competitive advantage, there has been a notable gap in research where these factors are comprehensively examined together, particularly within the context of the freight forwarder industry. This study has managerial implications for freight forwarder companies as well as contributing to the growth of the research literature. An in-depth discussion of environmental uncertainty, the usage of Incoterms, alliance strategy, and their collective impact on competitive advantage is highly significant, relevant, and crucial for logistics companies. Understanding and managing environmental uncertainty is crucial for logistics organizations to reduce risks, maximize operations, and effectively adapt to changing conditions.

## 2. Literature review

### 2.1 Environmental Uncertainty

Companies dealing with complex and unpredictable environmental changes have a massive challenge from environmental uncertainty. New technologies like artificial intelligence and blockchain have completely changed modern company administration. On the other hand, focusing on financial resilience is still crucial in a challenging and uncertain time (Gupta et al., 2023). Environmental variables are approached from two different perspectives. The first is that the business depends on environmental variables to carry on with its operations and, more crucially, to maintain its competitiveness. The second is how decision-making is impacted by environmental uncertainty. (Koç et al., 2022). The definition of uncertainty is the belief

that something cannot be predicted. Strategic, organizational, and environmental/external uncertainty are the three types of uncertainty (Williamson, 1989).

Its concept of environmental uncertainty states that it is impossible to predict with great certainty how various environmental variables would impact the effectiveness or productivity of the supply chain's decision-making units. This unpredictability substantially impacts a company's operations, particularly its supply chain management, as it can create challenges in planning and decision-making. However, due to the speed of competition in business and other developments, it is more important than ever to speed up corporate operations and adaptability (Rasi et al., 2019). Companies need to implement appropriate managerial strategies and practices to overcome environmental uncertainty. Some common strategies are business diversification, operational flexibility, strategic partnerships, innovation, and risk management. In addition, it is also important to develop resilient organizational capabilities to deal with environmental uncertainty.

## 2.2 *Incoterm*

In export activities, calculating shipping costs set by international trade rules is one of the innovative methods in logistics (Nechaev & Schupletsov, 2021). However, in import activities, the opposite also applies. In order to choose the appropriate Incoterm, the organization must be able to do it effectively. Due to Incoterms, there are rules for how shipping terminology should be interpreted in the global business community. From both the seller's and the buyer's perspectives, Incoterms stresses who is in charge of carrying out specific operational activities associated with the movement of products and who formally pays for transportation costs and customs fees (Chung & Lee, 2013). Indeed, Incoterms play a critical role in partitioning the tasks, costs, and risks associated with delivering goods between suppliers and buyers in a company. They provide a standardized framework for defining the responsibilities and obligations of each party in the transaction, ensuring clarity and efficiency in international trade. The ICC updated the document when it was essential to reflect current conditions and improve business facilitation (Davis & Vogt, 2022). Incoterm rules are usually applied in international sales contracts where items cross international borders. However, trade organizations like the European Union have streamlined border procedures worldwide (Kubáňová & Ptak, 2017). Incoterms are terms in commerce that clearly define the seller's logistical commitment and the channels that connect trade and logistics (Stojanović & Ivetić, 2020b). The Incoterms standards impact the control and management of logistics systems, as well as the rights and obligations of the parties to a commercial contract (Yang, 2021).

The ICC periodically updates its Incoterms to consider modifications to business procedures. The seventh iteration of Incoterms 2020, which was released by the ICC on September 10 and went into effect on January 1, 2020 (Baena-rojas et al., 2022; Bergami & Tichá, 2022; Kim, 2021, 2022; Stojanović & Ivetić, 2020a; Surakarsa et al., 2020). Incoterm 2020 is different from the 2010 version where there are seven main differences: Incoterm 2020 helps users in choosing the most appropriate incoterms determination, Bills of lading with on-board notation in FCA provisions, Placement of costs specifically in article incoterms, Differences in levels of Insurance coverage in terms of CIP and CIF, Arrangement of transportation using transportation owned by the seller or buyer himself in terms of FCA DAP DPU and DDP, Change of nomenclature from DAT to DPU, Requirements related to safeguards in the obligation of carriage (The International Chamber of Commerce, 2020a).

Incoterms are important in bargaining power between sellers and buyers. Avsar and Batmaz (2022) study revealed that bargaining and experience are important in the delivery term. This study is also relevant to a study conducted by Surakarsa (2020) that the cooperation and bargaining power of sellers and buyers affect the selection of delivery terms. Bargaining power is one of the bases for sellers and buyers in choosing Freight forwarder companies for shipping goods. The Freight forwarder will receive the routing order from the seller or buyer and form the basis of the contract of carriage. The ability of marketers in the Freight forwarding industry to choose customers with the correct delivery terms impacts sales performance and improves the company's competitive advantage. This different perspective is unique to this study to expand the repertoire and literature logistics.

## 2.3 *Strategic Alliance*

A strategic alliance is a collaboration between organizations working together to achieve a common goal (Hübel et al., 2022), while according to Kohtamäki (2023) alliances are associations between companies that cooperate to accomplish a shared purpose, that is, enhancing competitive advantage, expanding the market, or developing a new product. An alliance, another perspective, is a formal and contractual relationship between several members of different forms of organizations (companies, research centers, government agencies) and different industries, who work together in conditions of technological uncertainty and trust between members (Gerges-Yammine & Ter Wal, 2023). Strategy alliances have many benefits, including increased sales growth, improved product quality, achievement of planned goals, knowledge transfer and creation, innovation, and alliance learning ability (Zahoor et al., 2023). Strategic alliances between established companies and sustainability-focused startups can be an important source of learning for sustainability innovation (Hübel et al., 2022). Forming strategic alliances can help divide the proportion of risks and can help in monitoring environmental, service, and communication risks (Jiang et al., 2018). Alliances are an effective way to achieve corporate goals by leveraging synergies with strategic partners. Strategic

alliances play a dual role in driving service strategy and enabling its implementation by providing a shared environment that facilitates allied companies in overcoming traditional barriers to servitization (Rapaccini et al., 2019).

Despite the fact that they can provide significant benefits, companies may face several obstacles in carrying out alliance strategies, so companies must continue to learn to carry out alliance strategies (Kohtamäki et al., 2023). Alliances often take a long time to achieve the desired results, so it is necessary to evaluate and time the alliance (Oliveira et al., 2023). In open multiparty alliances, where members work together in technological uncertainty and trust between members from different industries, companies mimic exit decisions from their peers (Gerges-Yammine & Ter Wal, 2023). To overcome these obstacles, companies must select the right partners, build trusting relationships, clearly understand goals and expectations, and have effective conflict resolution mechanisms. Open and transparent communication is also key in overcoming obstacles in business alliances.

#### *2.4. Competitive Advantage*

A company's position of dominance in the market is known as its competitive advantage (Fernandes et al., 2023). Competitive advantage is an organization's capacity to outperform rival companies in the same industry or market (Porter, 1985). Companies can beat rivals thanks to a competitive advantage (Basterretxea and Martínez, 2012). Competitors find duplicating a firm's unique processes challenging, providing a competitive advantage. It is possible to describe a company's competitive advantage as its capacity to create, deliver, and market goods of excellent quality and superior to those of rivals (Leskovar-Spacapan & Bastic, 2007).

Porter (1980) Proposes three general strategies that are now known as generic strategies so that companies have a competitive advantage; cost leadership, differentiation, and focus. A company must have a cost-advantage strategy that generates profits above the industry average even if the asking price is not the highest. Differentiation strategies include influencing consumers' perceptions that the product or service is superior to brand, quality, and performance alternatives to command more excellent pricing. Focus strategies include using differentiation or cost management strategies in narrow market segments. Companies must pay attention to competitors' systems (Lu, 1999). Freight forwarders need the right strategy to survive and thrive amid increasingly fierce competition. If unable to implement the right strategy, the shipper and consignee will get low benefits from Freight forwarder services in facilitating logistics flow. Long-term cooperative relationships are profitable if they produce competitive costs and investment benefits (Lu and Dinwoodie, 2002). However, the implementation of the strategy must be adjusted to the company's internal resources. For example, Istianah et al. (2021) reveal strategies for the survival of the Freight forwarder industry. A few tactics are maintaining adequate employee training and qualifications, increasing vendor collaboration, creating acceptable backup plans, keeping key players well-coordinated, and regularly maintaining and enhancing information technology. However, other studies consider alliance strategy a vital source of outside assistance in achieving competitive advantage (Cheng & Yeh, 2007; Song et al., 2000; Zhou et al., 2011). The author proposes the ability to choose the right Incoterm as an external factor and relational resources as an internal factor of the company as another vital factor to achieve competitive advantage.

#### *2.5 Freight Forwarders*

One of the companies offering logistics services is a Freight forwarder. Economic growth depends heavily on transportation, particularly in developed nations (Gonzalez et al., 2022). In Indonesia, the term Freight forwarder is known as transportation management services. The Ministry of Transportation grants the business license. Before obtaining a permit, companies must receive recommendations from associations recognized by the Government, such as the Indonesia Logistics and Forwarders Association, before the omnibus law. Future clients will expect the whole range of logistics services and the role of freight forwarders in the logistics supply chain will expand (Burkovskis, 2008; C.-S. Lu, 2004). The "spirit" of commerce is the flow of goods. In order to assist the development of Indonesia's import and export commerce, freight forwarder enterprises play a very vital role (Achmad Kuncoro, 2015). In traditional Freight forwarding, its role can be defined as agent and principal. As an agent, Freight forwarders only take orders and act on behalf of other parties. While as an agent, Freight forwarding gets orders and serves on its behalf. The Incoterms that service users select are closely related to the roles of agent and principle. Freight forwarding companies must choose the appropriate type of Incoterm to get customers. In Indonesia, Freight forwarding is increasingly essential and has extensive activities. Freight forwarding activities include 22 actions, namely: receiving, managing storage, sorting, packing, marking, measuring, weighing, transportation management, issuance of transportation documents, handling document settlement, booking of transportation space, shipping, distribution management, calculation of transportation costs, claims, insurance of shipping goods, payment, provision of information systems, provision of logistics services in traditional and international markets, provision of e-commerce, contractual carriers and delivery or receipt of certain goods. Freight forwarder activities in Indonesia include 22 actions as part of the evolution of activities from traditional Freight forwarders to business entities oriented to supply chain management activities.

Freight forwarders in the very competitive modern transportation industry must contend with risks from shipping firms that could enter the cargo markets' next stage and with homogenous competition (Zhang et al., 2023). Freight forwarders must reduce fulfillment costs by exploiting various shipping methods (Krajewska & Kopfer, 2006). One of the challenges of Freight forwarding today is the ability to evolve the business into digital Freight forwarding. Digital freight forwarding is currently

flooding the logistics market with businesses so disruptive that the industry has redefined the rules of the game (Michel & Siegfried, 2020). Freight forwarder companies must have innovative and adaptive strategies for uncertain environmental changes (Ishak et al., 2019; Sugiono et al., 2022; Sarkar et al., 2001).

### 3. Hypothesis Development

#### 3.1 Effect of Environmental Uncertainty on Strategic Alliance

Previous research has found that environmental uncertainty positively and significantly affects strategic alliances in the Freight forwarder industry (Sugiono et al., 2022). Environmental uncertainty is related to changes in technology, government regulation, shifts in consumer preferences, and general changes in the industry or market. When this level of uncertainty is high, companies often face challenges in planning long-term strategies and managing risk. Environmental uncertainty can affect the process of selecting alliance partners. Companies tend to look for partners with the relevant knowledge, resources, or expertise to overcome the uncertainty they face. For example, in a fast-changing tech industry, companies might look for partners with expertise in innovation and research to help them deal with uncertain technological changes. The proposed theory is as follows because of the previous description:

**H<sub>1</sub>:** *The environment has a beneficial impact on the effectiveness of strategic relationships.*

#### 3.2 Effect Incoterm on Strategies Alliance

Previous research has found that the selection of Incoterm positively and significantly affects strategic alliances in the Freight forwarder industry (Sugiono et al., 2022). Incoterm affects the physical distribution of goods and logistics. In strategic alliances where logistics and supply chain collaboration are important, selecting the right Incoterm can be a determining factor in determining the roles and responsibilities of each alliance partner. Incoterm also affects the financial and cost aspects of strategic alliances. Choosing who is responsible for shipping costs, insurance, import duties, and shipping taxes can affect the alliance's economic structure and the cost-sharing between partners. Considering fairness and balance in sharing costs and benefits in strategic alliances is important. Teori yang diusulkan adalah sebagai berikut mengingat uraian sebelumnya:

**H<sub>2</sub>:** *Incoterms have a positive effect on Strategic Alliance.*

#### 3.3 Effect of Environmental Uncertainty on Competitive Advantage

Previous studies have found positive and significant environmental uncertainty with competitive advantage (Koç et al., 2022; Matanda & Freeman, 2009; Sugiono et al., 2022). An uncertain environment often leads to the emergence of new opportunities. Changes in regulation, market trends, or technology can create loopholes that companies can exploit to develop a competitive advantage. Companies that identify these opportunities quickly and effectively can gain a competitive advantage by offering products or services that match the new market demands. Environmental uncertainty forces companies to adapt and innovate. Companies that quickly adjust their strategies, processes, and products can use changing environments to create a competitive advantage. Organizational flexibility and the ability to develop innovative ideas will provide an advantage in constant change and uncertainty. The proposed theory is as follows, given the previous description:

**H<sub>3</sub>:** *Environmental uncertainty has a positive effect on Competitive advantage.*

#### 3.4. Effect Incoterm on Competitive Advantage

Previous research has found that Incoterm positively and significantly affects competitive advantage (Gardner, 2012). Research conducted by Sugiono (2022) on 50 Freight forwarder companies in Indonesia confirms the positive and significant effect on strategic alliances. This study is to continue previous research to add literature related to the effect of Incoterm on competitive advantage, which is still little found. The theory proposed based on the description is as follows:

**H<sub>4</sub>:** *Incoterms have a positive effect on competitive advantage.*

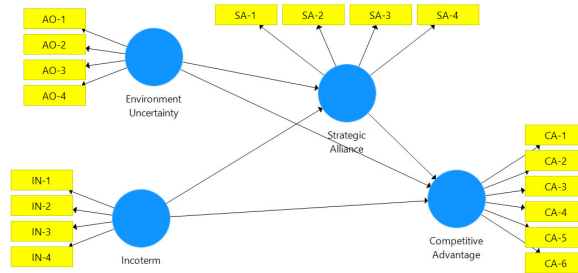
#### 3.5 Effect of Strategic Alliance on Competitive Advantage

Previous researchers have examined the Effect of the Strategic Alliance on Competitive advantage (Andrevski, 2009; Cacciolatti et al., 2020; Emami et al., 2022;). However, research specifically from the logistics service provider side, especially from Freight forwarders, is still tiny (Sugiono et al., 2022). This research is to continue previous research, especially in the Freight forwarder industry, with a better number of samples than previous studies.

**H<sub>5</sub>:** *Strategic alliances have a positive effect on Competitive advantage.*

**4. Method**

This study aims to analyze the effect of environmental uncertainty, Incoterm, on strategic alliances and the competitive advantage of Indonesian Freight forwarding companies. This research uses structural equation modeling analysis with the SmartPLS tools. The research's data came from the distribution of online surveys through social media. A five-point Likert scale was used in the questionnaire's design. In survey research in the social sciences, a five-point Likert scale is frequently used to gauge respondents' attitudes, opinions, and perceptions. Freight forwarders were the respondents in this study and were chosen using simple random sampling. Respondents are selected randomly to ensure that every member of the population has an equal chance of being included. The online survey had 75 respondents. Validity tests, reliability tests, and significance tests, or hypothesis tests, are the stages of data analysis. Fig. 1 displays a summary of the proposed models.



**Fig. 1.** Research Models

*Variable Indicator*

This research variable was collected from the results of previous studies and presented in Table 1.

**Table 1**  
**Indicator**

Latent Variable	Code	Indicator
Environmental uncertainty	EU1	1. Market turbulence is very shaking (Jaworski & Kohli, 1993)
	EU2	2. The competition is fierce (Jaworski & Kohli, 1993)
	EU3	3. High-speed technology turbulence (Jaworski & Kohli, 1993)
	EU4	4. Regulatory and legal changes are rapid (Calantone et al., 1994; McGinnis & Kohn, 1993)
Incoterm	IN1	1. Incoterms for our company can anticipate and resolve who should bear the risk (Avsar & Batmaz, 2022; Sugiono et al., 2022; Surakarsa et al., 2020; The International Chamber of Commerce, 2020b)
	IN2	2. Incoterms for our company can anticipate and resolve who should bear the costs (Avsar & Batmaz, 2022; Sugiono et al., 2022; Surakarsa et al., 2020; The International Chamber of Commerce, 2020b)
	IN3	3. Incoterms for our company can anticipate and resolve who should take responsibility (Avsar & Batmaz, 2022; Sugiono et al., 2022; Surakarsa et al., 2020; The International Chamber of Commerce, 2020b)
	IN4	4. Incoterms for our company can provide good bargaining power for negotiations with customers (Avsar & Batmaz, 2022; Sugiono et al., 2022; Surakarsa et al., 2020; The International Chamber of Commerce, 2020b)
Strategic Alliance	SA1	1. Reputation (Emami et al., 2022; Hamel & Prahalad, 1990; Hidayat & Hidayat, 2013; Muafi, 2000; Saffu & Mamman, 2000; Sugiono et al., 2022)
	SA2	2. Risk sharing (Emami et al., 2022; Hamel & Prahalad, 1990; Hidayat & Hidayat, 2013; Muafi, 2000; Saffu & Mamman, 2000; Sugiono et al., 2022)
	SA3	3. Skill and knowledge sharing (Emami et al., 2022; Hamel & Prahalad, 1990; Hidayat & Hidayat, 2013; Muafi, 2000; Saffu & Mamman, 2000; Sugiono et al., 2022)
	SA4	4. Improvement of the relationship (Emami et al., 2022; Hamel & Prahalad, 1990; Hidayat & Hidayat, 2013; Muafi, 2000; Saffu & Mamman, 2000; Sugiono et al., 2022)
Competitive Advantage	CA1	1. Compared to our competitors, we offer unique benefits and new features to our customers (Koç et al., 2022)
	CA2	2. Compared with our competitors, we offer high-quality products to our customers (Koç et al., 2022)
	CA3	3. Compared to our competitors, we provide reliable delivery (Koç et al., 2022)
	CA4	4. Compared to our competitors, we provide customized services (Koç et al., 2022)
	CA5	5. Compared to our competitors, we bring our products to market faster (Koç et al., 2022)

**5. Results and Discussion**

*5.1 Reliability Test Result*

Reliability measurement tests the reliability or precision of the measuring instruments used in measuring latent variables in the model. Reliability measurements indicate how these indicators consistently measure the same construct. In PLS, there are several commonly used methods for measuring indicator reliability, including Composite Reliability, Cronbach's Alpha, Rho\_A, and AVE. Calculating the degree to which the variability of the measured construct explains differences in indicators

yields composite reliability, a measure of a measuring instrument's dependability. CR values range from 0 to 1, and higher values indicate higher reliability. Generally, a CR value of 0.7 or greater is acceptable. Cronbach's Alpha is a traditional method often used to measure reliability in PLS analysis. It calculates the internal consistency between the indicators that make up the construct. Cronbach's Alpha values range from 0 to 1, and higher values indicate higher reliability (Guenther et al., 2023; Hair Jr et al., 2021; Kante & Michel, 2023; Purwanto et al., 2021). The generally accepted Cronbach's Alpha value is 0.7 or higher, but this limitation may differ depending on the study context. Good reliability measurements show that the indicators used in PLS are reliable and provide consistent results in measuring the desired latent variables. Good reliability measurements provide confidence in the validity of the effects of analysis and interpretation based on the PLS model.

**Table 1**  
Reliability Test

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Competitive Advantage	0.967	0.968	0.974	0.883
Environment Uncertainty	0.924	0.952	0.946	0.813
Incoterm	0.956	0.958	0.968	0.883
Strategic Alliance	0.955	0.956	0.968	0.883

Reliability scores for each composite in Table 1 of the SmartPLS tool are better than 0.7, showing that all variables have been tested and are reliable. The Cronbach's omission value is greater than 0.7, which denotes that the variable's level of dependability satisfies the requirements. After the test data results have been determined to be reliable, the validity test, which comprises the loading factor, AVE, Farnell Larcker Criterion, and cross-loading, is the next step. To view the loading factor test results, choose the outer loading menu. Next, choose the discriminant validity menu to view the Fornell Larcker criterion results. Finally, choose the cross-loading test. Both Cronbach's Alpha and composite reliability point to the outer model. The latent variable has strong dependability or reliability if the value is greater than 0.7. According to the test results, all variables have strong reliability because Cronbach's alpha and composite reliability values are larger than 0.7. In addition to loading variables, convergent validity is measured using AVE. If the AVE value is larger than 0.5, the indicator has a high degree of convergent validity.

The outer loading parameter in PLS-SEM analysis is used to judge how strongly indicators and latent components are correlated. The outer loading of the indicator shows how effectively it can explain the variation in the latent concept under investigation. To indicate a considerable contribution, the generally accepted outer loading value needs to be greater than 0.7.

**Table 2**  
Outer Loading

	Competitive Advantage	Environment Uncertainty	Incoterm	Strategic Alliance
	0.899	0.870	0.956	0.874
	0.929	0.917	0.939	0.948
	0.936	0.915	0.932	0.958
	0.967	0.904	0.932	0.975
	0.967			

The number is over 0.7, which indicates from the table above that all indicators effectively or adequately describe the measured construct. It's crucial to remember that the study's context, sample size, model complexity, and data usage features must all be considered when determining the outer loading value. Along with other data from the PLS-SEM analysis, such as reliability, validity, statistical significance, and the relative contribution of each indicator to the construct, the interpretation of outer loading values also needs to be seen holistically.

### 5.2 Convergent Validity Test Result

A research technique known as the concurrent validity test determines how closely two measurement instruments or variables should be connected or converged in measuring the same concept. This test checks whether two distinct tools may yield comparable results or meaningful correlations when assessing the same construct. The Convergent Validity Test is a technique for determining if two constructs in a study should be related to one another. The results of the Convergent Validity Test provided excellent support for the measurement instrument's dependability and accuracy by confirming a significant correlation between the two independent assessments. The results of the Convergent Validity Test were appealing since they showed a strong connection between the two independent evaluations. This result strongly supports the measurement tool's accuracy and dependability. The tight agreement between the two assessments demonstrates the consistency and trustworthiness of the data gathered. Our confidence in the tool's ability to precisely measure the critical variables is increased due to this validation, which also strengthens the validity of our research. Our research findings must be rigorously validated

to be reliable and significant, strengthening the basis on which our conclusions are based. Good convergent validity is a measurement category if the value is above 0.7.

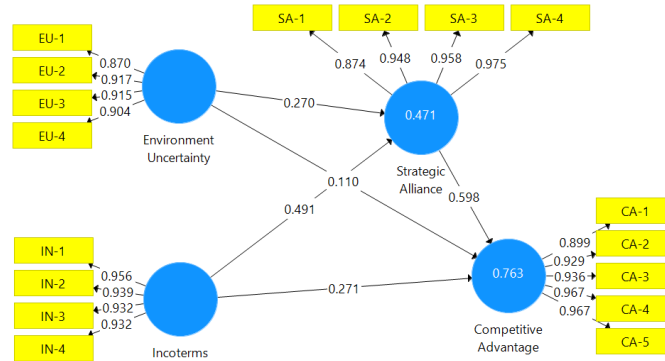


Fig. 2. Validity testing

5.3 Discriminant Validity

Construct analysis uses “discriminant validity” to describe how well a model or tool can distinguish between several constructs. The constructs tested by other indicators must be wholly distinct and not closely related to establishing the discriminant's validity. A more negligible correlation between indicators measuring various constructs than between indicators measuring the same construct is required for discriminant validity. Alternatively, different indicators must be more associated with the construct they measure than any other construct. Numerous techniques, such as the Fornell-Larcker Criterion and the HTMT Ratio, can be used to assess the validity of the discriminant (Heterotrait-Monotrait Ratio). This approach compares the relationship between the construct and its internal consistency square root (e.g., Composite Reliability). The validity of the discriminant is demonstrated when the square root of internal reliability is greater than the correlation with other components.

Table 3  
Fornell-Larcker Criterion

	Competitive Advantage	Environment Uncertainty	Incoterm	Strategic Alliance
Competitive Advantage	0.940			
Environment Uncertainty	0.606	0.902		
Incoterm	0.726	0.592	0.940	
Strategic Alliance	0.836	0.561	0.651	0.940

The table demonstrates that the square root of internal reliability is greater than the correlation, satisfying the discriminant's validity and allowing for the separation of the components. The table also demonstrates that PLS model constructs can be reliably distinguished from one another and are more strongly correlated with the indicators that measure them than with other constructs.

5.4. R Square

In regression models, the R Square statistic is used to quantify the contribution of the independent variable to the variability of the dependent variable. R Square is a regression metric that assesses how effectively the regression model accounts for the observed data. A regression model's R Square value, which ranges from 0 to 1, indicates how well it can explain variations in the dependent variable. The higher the number, the better. R Square values of 0.67 are often considered strong, 0.33 are considered moderate, and 0.19 are considered weak. These recommendations aid researchers and analysts in evaluating the regression models' goodness-of-fit and the degree to which the independent variables contribute to the variability seen in the dependent variable.

Table 4  
R Square

	R Square	R Square Adjusted
Competitive Advantage	0.763	0.755
Strategic Alliance	0.471	0.459



From Table 4, the R Square values indicate the strength of the relationships between the variables under consideration. It shows that environmental uncertainty has a significant influence of 45.9% on strategic alliances. It's crucial to remember that not all potential effects on these variables were considered in this study. Furthermore, competitive advantage is affected by strategic alliance, environmental uncertainty, and Incoterm by 75.5%. The remaining influence on competitive advantage is likely attributed to other variables that were not specifically addressed or analyzed in this study. This underscores the complexity of real-world business scenarios, where numerous factors can contribute to competitive advantage beyond those studied here.

### 5.5 Hypothesis Test Result

**Table 5**  
Hypothesis Test Result

	T Statistics	P Values	Result
H1: Environment Uncertainty → Strategic Alliance	2.513	0.012	Supported
H2: Incoterm → Strategic Alliance	6.493	0.000	Supported
H3:Environment Uncertainty → Competitive Advantage	1.971	0.049	Supported
H4:Incoterm → Competitive Advantage	3.461	0.001	Supported
H5: Strategic Alliance → Competitive Advantage	10.132	0.000	Supported

#### *Effect of Environment Uncertainty on Strategic Alliance*

Based on the data processing results, it was found that Environmental uncertainty has a positive and significant effect on the strategic alliance. These results are consistent with research conducted by Sugiono (2022) and (Gerges-Yammine and Ter Wal (2023). Firms frequently create strategic partnerships with other organizations when the environment is highly unclear. Organizations are more adaptable and resilient to unforeseen environmental changes when they pool their resources and skills. Organizations can acquire resources and skills through strategic alliances that they might not have had access to otherwise. Lowering reliance on limited internal resources aids organizations in coping with uncertainty. Creating new technologies is another way that strategic alliances can be used. In an uncertain environment, businesses may work with partners with varied knowledge and skills to develop new goods or services that can adapt to environmental changes. Creating strategic alliances requires consideration of environmental uncertainty (García-Pérez et al., 2012)

#### *Effect Incoterm on Strategic Alliance*

Based on the data processing results, it was found that Incoterm had a positive and significant effect on the strategic alliance. This finding backs up earlier studies by Sugiono (2022). The Incoterm explains who between the exporter and the importer is responsible for paying for and transporting goods. Understanding roles and logistical costs is essential when two or more businesses collaborate strategically to achieve a common goal. Incoterm may impact the Strategic Alliance's shipping cost sharing, insurance policies, and associated risks. Incoterm likewise affects the financial aspects of the Strategic Alliance. The provisions of the Incoterm will define who is in charge of paying the shipping, insurance, and customs fees, for instance, if a Strategic Alliance entails selling items from one company to another. This might affect the parties' net profits, profit margins, and price agreements. Incoterm may impact the Strategic Alliance's parties' operational alignment. The Incoterm agreement will impact production, inventories, and the supply chain on the responsibility and delivery time of goods. It is crucial in a Strategic Alliance to make sure that all parties comprehend the chosen Incoterm's terms and can coordinate their efforts accordingly. A clear understanding and excellent communication between the parties are also necessary for using Incoterm in a Strategic Alliance. Each person involved in a shipment of products should be aware of how Incoterm affects their obligations, risks, and expenses. Tension and conflict in a collaborative strategic effort might be caused by misunderstandings or poor communication. Therefore, choosing and implementing the proper Incoterm in the Strategic Alliance is crucial to guarantee operational alignment, adequate logistics arrangements, fair financial balance, and effective communication between the parties.

#### *Effect of Environment Uncertainty on Competitive Advantage*

According to the research gathered, environmental uncertainty has a positive and considerable impact on competitive advantage. This study is in line with the findings of Koc (2022), Matanda (2009), and Sugiono (2022). Environmental uncertainty can affect how new, unidentified possibilities or threats emerge. Businesses that foresee these developments and swiftly revise their strategy can have an advantage over rivals. They can seize newly presented options and stay safe from potential dangers. Uncertainty in the environment can also influence how the organization makes strategic decisions. Companies may be less ready to take risks or more likely to embrace cautious business strategies that limit significant changes when faced with high levels of uncertainty.

On the other hand, companies that are adept at managing uncertainty can take calculated risks and seize new chances, giving them a long-term competitive advantage. Increased market rivalry is frequently a result of high uncertainty. To remain relevant in this fast-changing market, businesses must adapt swiftly and preserve their competitive advantage. Intense competition can facilitate competitive advantage, spur innovation, create new products, and increase operational effectiveness.

#### *Effect Incoterm on Competitive Advantage*

Data processing findings indicate that Incoterm significantly and favorably affects competitive advantage. These outcomes are consistent with Gardner's previous study (Gardner, 2012). The use of Incoterm may impact the effectiveness of the company's logistics. Incoterms that specify that sellers are responsible for delivering the items (like EXW or FCA) can give businesses a competitive edge by allowing them to manage their supply chains and logistics expenses. Incoterm impacts the division of shipping expenses between buyers and sellers. Careful Incoterm selection can assist businesses in reducing transportation costs and preserving their pricing edge. The appropriate Incoterm selection can also affect how quickly things are delivered. Delivery speed plays a crucial role in gaining a competitive advantage in a world of fast-moving international business. Faster delivery can be guaranteed by incoterms like "CIF" or "CIP," which might be advantageous in a competitive market. Incoterm defines the risks and obligations connected with the delivery of goods. Competitive advantage may be impacted by choosing incoterms that maximize the risk and responsibility distribution between suppliers and buyers. For instance, using Incoterms like "DAP" or "DDP" can give buyers a sense of trust and lower the risks involved with delivering goods. Customer satisfaction can be raised by choosing incoterms that consider their demands. Customer happiness is crucial for preserving a competitive advantage in an environment of intense competition. For instance, employing an Incoterm that incorporates shipping expenses can be convenient for customers by minimizing additional responsibilities. A thorough analysis of the company's objectives, market demands, and business attributes should be the starting point to select the best Incoterm. Companies can obtain a competitive edge in terms of operational effectiveness, excellent delivery prices, quick delivery times, risk reduction, and customer satisfaction by selecting a suitable Incoterm. The findings of this study also support Sugiono's earlier work in this area (Sugiono et al., 2022) in the same industry, namely Freight forwarder companies in Indonesia.

#### *Effect of Strategic Alliance on Competitive Advantage*

The data analysis revealed that the strategic alliance significantly and favorably impacted competitive advantage. These findings concur with those of earlier research, including Andrevski's (2009), Cacciolatti's (2009), Emami's (2022), and Hidayat's (2013). Through strategic alliances, companies can access their partners' resources and competencies. For example, a manufacturing company may ally with a technology company to access the latest technology. By leveraging the resources and competencies gained through alliances, companies can develop competitive advantages in product innovation, operational efficiency, or technological excellence. Strategic alliances can help companies expand the scale of their operations or enter new markets. By sharing resources, risk, and expertise, companies can achieve better economies of scale or access previously hard-to-reach markets. It can provide a competitive advantage through the ability to offer products or services at more competitive prices or reach new customers. Through strategic alliances, companies can expand and diversify their product or service portfolio. Diversification can help companies reduce the risks associated with reliance on one particular product or market. By providing customers with a wide array of products or services, companies can meet different needs and create a competitive advantage in terms of product or service differentiation. Companies can share knowledge, experience, and best practices with their partners through strategic alliances. This can strengthen organizational capabilities and help companies adopt innovations, more effective work processes, or better marketing strategies. By improving organizational capacities, companies can gain a competitive advantage in quality, efficiency, or superior customer service. These results also confirm the research that has been conducted by Sugiono (2022)

### **6. Novelty, Theoretical, Practical, and Managerial Implication**

The novelty of this study is the influence of environmental uncertainty and Incoterm on strategic alliance and competitive advantage in the Freight Forwarder Industry in Indonesia. The theoretical implication supports previous theories on environmental uncertainty and Incoterm to increase competitive advantage through strategic alliances. The practical implication is for the management of a Freight forwarding company to scan the uncertainty of the logistics environment and implement the selection of the right Incoterm to encourage strategic alliances to encourage competitive advantage. This research contributes to the contribution of information to the development of scientific principles, in particular strategic management. This research also contributes as reference and comparison material in developing further studies on the effect of environmental uncertainty and Incoterm on strategic alliance and competitive advantage in the Freight Forwarder Industry in Indonesia.

### **7. Conclusion**

Based on the research results and discussion of the effect of environmental uncertainty and Incoterm on strategic alliance and competitive advantage, It can be concluded that environmental uncertainty positively affects strategic alliances. Incoterm has a positive effect on strategic alliance; environmental uncertainty has a positive effect on competitive advantage; Incoterm has

a positive effect on competitive advantage; and strategic alliance has a positive effect on competitive advantage. According to our findings, a Freight forwarding company should scan the uncertainty of the logistics environment and implement the selection of the right Incoterm to encourage strategic alliances so that it will encourage competitive advantage. This research will likely be expanded by looking into various industries, such as manufacturers, that have formally adopted SCM practices.

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