

Supply chain strategy and supplier environment on competitive advantage: The moderating role of environmental uncertainty

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ABSTRACT

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As one of the garment producers in the world, Indonesia continues to strive to increase its competitive advantage in the current growth and development. Various factors can influence the improvement of competitive advantage in the garment sector. This study investigates the competitive advantage in the garment sector as influenced by supply chain strategy and supplier environment, moderated by environmental uncertainty in garment companies in West Java. The population of this study was 250 garment companies, and the sample was 152 respondents. Data were collected through questionnaires and analyzed using Partial Least Square (PLS). The findings of this study are (1) supply chain strategy is positively influenced by supplier environment; (2) competitive advantage is influenced by supplier environment and supply chain strategy; and (3) environmental uncertainty can moderate supplier environment and supply chain strategy in influencing competitive advantage.

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1. Introduction

Indonesia is one of the world's largest producers of garments (textiles, textile products, and footwear or TPA), with a large and growing domestic market and significant export sales. Indonesia also produces a wide range of clothing, including t-shirts, jeans, dresses, and sportswear. The garment industry significantly contributes to the Indonesian economy, providing employment for millions of people and generating substantial export earnings. According to data from the Indonesian Textile Association, the industry employs around 2.8 million people and contributes around 1.3% of the country's total GDP (Lopez-Acevedo & Robertson, 2016). It is also stated that the garment industry is a major component of Indonesia's manufacturing industry and a significant employment source, especially for women.

Indonesia's garment industry faces both opportunities and challenges. On the one hand, the country has a large and relatively cheap labor force, which has helped it become a significant player in the global garment industry. However, the industry also faces competition from other low-cost garment-producing countries, such as Bangladesh and Vietnam (Haseeb et al., 2020; Hossian et al., 2019; Kathuria, 2018). In addition, concerns about the industry's labor rights and environmental practices have been raised, leading some brands and consumers to demand greater transparency and Sustainability in the supply chain (Hidayati et al., 2023; Perez-Franco et al., 2016). Investment in the sector has been substantial and well-managed, ported by a diversification of export partners, but output has slowed. The industry's declining economic performance is driven by the

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textiles and apparel sub-industry, with a pick-up in footwear and leather products. This helped stem the decline in overall landfill employment. Labor productivity in the industry is relatively high compared to regional competitors (though lower than in countries such as Thailand and the Philippines), which may partly reflect the relatively high level of education in the industry (Saluy et al., 2021)

This condition is related to the competitive advantage in the sector. The garment industry in Indonesia has several competitive advantages that can encourage the industry to become a significant player in the global market (Sukwadi et al., 2012; Sutapa et al., 2017). Indonesia has a large and growing domestic market for TPA products. With a population of more than 270 million, a significant market certainly exists for local producers, allowing them to achieve economies of scale and compete more effectively with foreign companies (Rothenberg et al., 2016). Another factor supporting the garment sector's competitive advantage is low labor costs. Indonesia has relatively cheap labor, which makes Indonesia a competitive garment producer (Kuncoro, 2013). This condition attracts foreign investors who want to take advantage of lower costs and local companies who want to expand their operations.

Despite the low labor costs, it turns out that the garment industry in Indonesia has a large and relatively skilled workforce, with many workers having years of experience in the industry (Lee & Wie, 2015). This has helped local companies to produce high-quality garments that meet the needs of customers around the world. It is also reinforced by implementing policies from the Indonesian government to support the growth of the garment industry, such as tax incentives and export promotion programs (Indris & Primiana, 2015). This has helped local companies to expand their operations and compete more effectively with foreign companies. With its strategic location in the Southeast Asian region, Indonesia has become an attractive location for companies producing various products, including garments, to be exported to European, Middle Eastern, Asian, and even American markets (Julian et al., 2014)

Despite these advantages, the garment industry in Indonesia also faces various challenges, such as labor rights concerns and competition from other low-cost producers. Competitive positions must maintain that the industry must continuously adapt and innovate while overcoming these challenges (Wahyono & Hutahayan, 2021). Achieving a sustainable competitive advantage in the garment industry in Indonesia needs to be supported by an appropriate supply chain strategy and supplier environment in conditions affected by environmental uncertainty (Setiawati et al., 2022). Although in the same industry, each company certainly faces a different environment with different competition as conditions continue to change in the business environment. Thus, this study aims to examine the competitive advantage in the garment sector as influenced by supply chain strategy and supplier environment, moderated by environmental uncertainty in garment business entrepreneurs in West Java.

2. Literature Review

2.1 Competitive Advantage

The theory of competitive advantage states that firms can gain a competitive advantage by differentiating products or services, focusing on cost leadership, or both. This means that a firm must be better or different from its competitors in a way that customers value. In this case, a company can gain competitive advantage by offering superior quality, faster delivery times, or lower prices compared to its competitors (Chen, 2019; Priyanto et al., 2023)

Sustainable competitive advantage refers to the long-term competitive advantage that a company can maintain over time (Rua et al., 2018; Harini et al., 2023). The advantage is achieved by creating unique and valuable products or services that are difficult for competitors to replicate. The company needs to have a deep understanding of its customers, its industry, and its competitors. Sustainable competitive advantage can be achieved through a combination of factors such as technological innovation, strong branding, efficient supply chain management, skilled labor, and strategic partnerships (Kwak et al., 2018; Ricardianto et al., 2023a)

A sustainable competitive advantage is vital because it enables a company to maintain its market position, achieve higher profits, and adapt to changes in the competitive environment (Li & Liu, 2014; Fathony et al., 2020). In the context of the garment industry in Indonesia, sustainable competitive advantage can be achieved through initiatives such as implementing sustainable and ethical practices in the supply chain, investing in new technologies to improve productivity and efficiency, or developing strong brands that are recognized for their quality and innovation.

Overall, the theory of competitive advantage and sustainable competitive advantage are essential concepts for businesses to consider in strategizing (Jones et al., 2018), particularly in competitive industries such as the garment industry in Indonesia. Companies can gain a competitive advantage and achieve sustainable growth by creating unique and valuable products or services. In this research model, competitive advantage can be measured by six dimensions, namely: cost structure, branding, quality of product, distribution network, intellectual property, and customer service (Suryawan et al., 2023; Ricardianto et al., 2023).

2.2 Supply Chain Strategy

The supply chain is a channel that explains how a product gets from the product to the consumer (Ricardianto et al., 2022). Therefore, this process includes the initial process from raw materials to consumers. Each process in the supply chain will

cost money, so the longer it is, the smaller the percentage of profit consumers get. Therefore, many companies are expanding by mastering the process from upstream to downstream to optimize their profits and increase their competitive advantage. The supply chain is closely linked to marketing and customer value. Companies seek to provide customer value at a certain level of profit (Indupurnahayu et al., 2023). Companies can win by aligning value delivery processes and selecting, providing, and communicating superior values to increasingly discerning buyers.

Supply chain strategy has been applied in the supply chain management suite (Kannan & Tan, 2005). An integrated supply chain strategy can help companies balance conflicts among their functions to respond to high supply chain costs, high inventory levels, poor customer service, interdepartmental conflicts, and goal restructuring challenges. In the competitive global environment in which companies operate today, developing a successful supply chain strategy is critical to a company's long-term competitive success (Narasimhan et al., 2008).

Supply chain strategy can help managers improve their company's integration with suppliers and customers and improve the business performance of the company and its supply chain partners (Roh et al., 2014). Overall, supply chain strategy is considered a prerequisite for supply chain management in any company, noting that top actors have a clear supply chain strategy aligned with overall business goals and customer requirements (Hilletoft, 2011). This study's measurement of supply chain strategy refers to previously established theories (Barata et al., 2022). In this case, supply chain strategy is measured through five dimensions: Coverage, Clarity, Feasibility, Internal Strategic Consistency, and External Strategy Consistency.

2.3 Supplier Environment

Suppliers in an organizational environment have their position besides distributors, competitors, and customers. All the factors that affect a company's operations are known as the marketing environment. The company can control some factors, but some factors cannot be controlled. A company's marketing environment consists of actors and forces outside of marketing that affect marketing management's ability to build and maintain successful relationships with target customers (Sanzo et al., 2003).

Business success depends on suppliers when they enjoy authority. Company suppliers hold power when they are the only ones in the market or the largest supplier of goods. Buyers are not crucial to the supplier's business, as the supplier's goods are the core ingredients of the buyer's finished product. The success of a company's marketing strategy also depends on resellers if the company's finished goods are brought to market by market intermediaries or other third parties. These forces include wholesalers and retailers.

A supplier is a party that provides a product or service to another party so that this party can carry out its business. In economic activities, suppliers are the ones who provide the best quality products to producers so that they can produce goods/services with the best quality and at the best price so that distributors can benefit as well during distribution to end consumers. This makes suppliers important in ensuring that the business process from manufacturers to retailers/distributors can run well (Tang et al., 2001). Supplier environment measurement is all factors that affect the operation of a company, which the company can or cannot control. The measurement of the supplier environment in this study refers to several concepts and theories previously described (Ralston et al., 2015; Endri et al., 2021). In this study, the measurements include (1) Dependence, (2) Relationship, (3) Collaboration, (4) Bonds, and (5) Technology and Investments.

2.4 Environmental Uncertainty

Environmental uncertainty is a condition where the organization needs more information about environmental factors, which makes it difficult to predict demand due to a changing environment. This condition occurs when managers need more information regarding environmental conditions, making it difficult to predict changes that might cause company plans not to run optimally (Arieftiara et al., 2019). Environmental uncertainty occurs due to external factors that change rapidly and cannot be accurately predicted by the organization, resulting in the organization changing its process and structure (Mao et al., 2015). The changes made are, of course, not easy because the organization does not yet have sufficient knowledge about what kind of organization is suitable for dealing with the new environment, so businesses can only refer to other organizations that are considered successful in dealing with these environmental changes (Suryatni et al., 2023). Based on these conditions, environmental uncertainty will be a moderating variable in this study to analyze the effect of environmental uncertainty on business processes.

3. Methods

This empirical study uses a quantitative approach and descriptive survey method to obtain data from respondents. The population of this study is 250 garment companies in West Java. The sample was taken proportionally so that 152 respondents were obtained. The data were analyzed with Partial Least Square (PLS) to evaluate the measurement and structural models. The supplier environment construct is an exogenous variable consisting of five dimensions: Dependence, Relationship, Collaboration, Bonds, and Technology and Investments. Supply chain strategy is a mediating variable consisting of five dimensions: Coverage, Clarity, Feasibility, Internal Strategy Consistency, and External Strategy Consistency. Competitive advantage is an endogenous variable consisting of six dimensions, namely: cost structure, branding, quality of product, distribution network, intellectual property, and customer service.

Table 1
Construct Measurement

Latent Variable	Dimension
Supplier Environment (SE)	1. Dependence
	2. Relationship
	3. Collaboration
	4. Bonds
	5. Technology and Investments
Supply Chain Strategy (SCS)	1. Coverage
	2. Clarity
	3. Feasibility
	4. Internal Strategy Consistency
	5. External Strategy Consistency
Competitive Advantage (CA)	1. cost structure
	2. branding
	3. quality of product
	4. distribution network
	5. intellectual property
	6. customer service
Environmental Uncertainty (EU)	Dummy: 0 = not predictable; 1 = predictable

Fig. 1 presents a conceptual model of the influence of supplier environment on supply chain strategy and competitive advantage, moderated by environmental uncertainty.

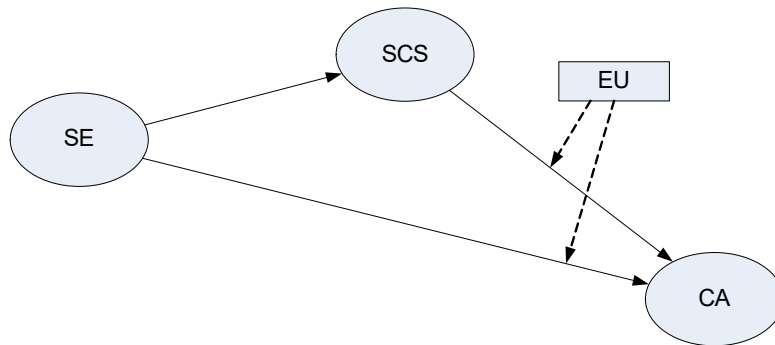


Fig. 1. Conceptual Model

4. Results

The PLS output here reports the estimated measurement and structural models based on modeling and analysis of composite variables or indicators. The model involves the influence of SE on SCS, SE on CA, SCS on CA, and the moderating effect of EU in the influence of SE → CA and SCS → CA (see Fig. 2).

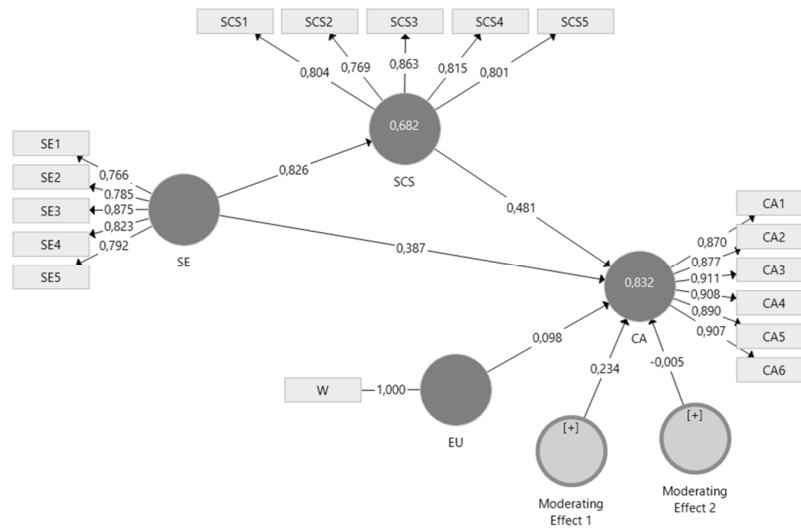


Fig. 2. Overall Estimation Model

Based on the output of the estimation model, the path coefficient of $SE \rightarrow SCS$ is 0.826, $SE \rightarrow CA = 0.387$; $SCS \rightarrow CA = 0.481$; $EU \rightarrow CA = 0.098$; moderation effect of $SE*EU \rightarrow CA = 0.234$, and moderation effect of $SCS*EU \rightarrow CA = -0.005$. Referring to the model, the Equation in the model is:

$$SCS = 0.862 SE, \text{ with } R^2 = 0.682 \quad (1)$$

$$CA = 0.387 SE + 0.481 SCS + 0.098 EU + 0.234 SE \times KP - 0.005 SCS \times KP \text{ with } R^2 = 0.832 \quad (2)$$

Referring to Eq. (1), the coefficient of determination from SE to SCS is 0.682, which means the supplier environment can explain 68.2% of the variance of the supply chain strategy. Equation (2) shows that the value of $R^2 = 0.832$, which means the supplier environment, supply chain strategy, and environmental uncertainty can explain 83.2% of the variance of competitive advantage. Table 2 presents the outer model explaining each construct's loading value.

Table 2
Outer Loadings

	CA	EU	SE	Mod 1	Mod 2	SCS
CA1		0.870				
CA2		0.877				
CA3		0.911				
CA4		0.908				
CA5		0.890				
CA6		0.907				
SE * EU					0.962	
SE1			0.766			
SE2			0.785			
SE3			0.875			
SE4			0.823			
SE5			0.792			
SCS * EU						0.914
SCS1						0.804
SCS2						0.769
SCS3						0.863
SCS4						0.815
SCS5						0.801
EU		1.000				

Referring to the PLS quality criteria, all variables' Cronbach's Alpha (CA) value is more than 0.7, and the composite reliability (CR) value is more than 0.7. All latent variables' Average Variance Extracted (AVE) values are more than 0.5 (see Table 3). These values indicate that all constructs are reliable and valid, consistent with their construct reliability and validity.

To estimate the effect size, the f-squared value is used as a practical significance measure concerning the magnitude of the effect. This effect size value indicates that the local effect size of each construct in the context of the multivariate regression model is significant. Table 4 reports the effect size values of each path.

Table 3
Construct's Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
CA	0.950	0.960	0.799
EU	1.000	1.000	1.000
SE	0.868	0.904	0.655
Mod Effect 1	1.000	1.000	1.000
Mod Effect 2	1.000	1.000	1.000
SCS	0.869	0.906	0.657

Table 4
Interpretation of f^2

Construct	SCS	Effect	CA	Effect
EU				0,046 Small
SE	2,142	Substantial		0,254 Substantial
Mod Effect 1				0,097 Small
Mod Effect 2				0,000 Unsubstantial
SCS				0,357 Substantial

Table 5 presents a recapitulation of the results of hypothesis testing using bootstrapping.

Table 5
Recapitulation of Hypothesis Testing

Path	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values	Hypothesis
SE → SCS	0.826	0.827	0.031	26.986	0.000	Accepted
EU → CA	0.098	0.098	0.042	2.319	0.021	Accepted
SE → CA	0.387	0.392	0.059	6.610	0.000	Accepted
Mod Effect 1 → CA	0.234	0.236	0.057	4.102	0.000	Accepted
Mod Effect 2 → CA	-0.005	-0.010	0.069	0.069	0.945	Not Accepted
SCS → CA	0.481	0.478	0.059	8.212	0.000	Accepted

Based on the results of hypothesis testing, the hypothesis of the influence of the supplier environment on business strategy is accepted. The competitive advantage model significantly influences this construct by the business environment, supply chain strategy, and environmental uncertainty. In this model, supply chain strategy can mediate the effect of the supplier environment on competitive advantage. This model also shows that environmental uncertainty can moderate the relationship between supply chain strategy and competitive advantage. However, environmental uncertainty does not moderate the relationship between supply chain strategy and competitive advantage.

5. Discussion

The results prove that the supplier environment significantly affects supply chain strategy. Supplier environment refers to various factors and conditions that affect the performance and behavior of suppliers, including the capabilities, capacity, location, reliability, and competitiveness of those suppliers (Routroy & Pradhan, 2014). The supplier environment can influence supply chain strategy in several ways. The first is supplier selection. The supplier environment can influence the criteria used to select suppliers. Suppose the supplier is located in a high-risk region with an unstable political environment. In that case, the supply chain strategy may prioritize more resilient suppliers with a broader geographical footprint (Kilic, 2013). Second is the supplier relationship. The supplier environment can affect the relationship between suppliers and buyers. With suppliers being highly competitive and having bargaining power, buyers may need to develop closer relationships with key suppliers to ensure consistent supply and better prices (Ayhan & Kilic, 2015).

In addition, the supplier environment can affect supply chain flexibility. Suppose a supplier has limited capacity or long lead times. In this case, the supply chain strategy may need to include alternative suppliers, buffer inventory, or use agile manufacturing techniques to respond to various changes in demand (Sulistyoningrum et al., 2020). In addition, the supplier environment can also affect supply chain resilience. Supply chain strategies may need to include risk mitigation measures, such as dual sourcing, inventory stockpiling, or supply chain mapping if suppliers are vulnerable to disruptions, such as natural disasters or geopolitical events (Piprani et al., 2020). The supplier environment can affect supply chain cost management and structure, so it may be necessary to investigate alternative sourcing options or renegotiate contracts for suppliers with high transport costs or tariffs (Riezebos & Zhu, 2015).

In the garment industry in Indonesia, an effective supply chain strategy can be a significant source of competitive advantage (Sukwadi et al., 2013). Various efforts have been made so that companies in the Indonesian garment industry can utilize supply chain strategies to achieve a competitive advantage. One way to achieve competitive advantage is to minimize costs throughout the supply chain (Utarayana & Sudiarta, 2021). Companies can save costs by optimizing logistics and transportation, streamlining production processes, and sourcing materials and labor at the lowest possible prices. By reducing costs, companies can offer more competitive prices to customers while increasing profit margins.

The influence of supply chain strategy on competitive advantage can also be observed from efforts to build an agile supply chain that can respond quickly to changes in demand, market conditions, and customer preferences. Companies that quickly adjust their production schedules, inventory levels, and distribution networks are better positioned to capture new business opportunities and outperform their competitors. The influence of supply chain strategy on competitive advantage can also be observed from efforts to build an agile supply chain to respond quickly to changes in demand, market conditions, and customer preferences (Bari & Park-Poaps, 2020). Companies that quickly adjust their production schedules, inventory levels, and distribution networks are better positioned to capture new business opportunities and outperform competitors.

Quality is critical to maintaining customer satisfaction and loyalty in the garment industry and other sectors, such as agri-food (Reklitis et al., 2021). Supply chain strategies prioritizing quality control and assurance can help companies differentiate themselves from competitors and build a reputation for excellence. This can include rigorous supplier selection and auditing processes, intensive inspection and testing, and comprehensive quality control systems.

Sustainability is becoming increasingly important in the garment industry, with consumers and stakeholders expecting companies to implement environmentally friendly and socially responsible practices (Sinaga et al., 2019; Nusraningrum et

al., 2023). Supply chain strategies emphasizing Sustainability can help companies reduce negative environmental impacts, improve working conditions and labor practices, and build a positive brand image. This can include sourcing sustainable materials, reducing waste and emissions, and implementing ethical labor practices.

In the garment industry in Indonesia, the supplier environment can significantly impact a company's competitive advantage. The quality and reliability of suppliers can significantly impact the quality of the final product and the company's ability to meet production deadlines (Mohammed, 2020). Companies that have established relationships with high-quality and reliable suppliers may be better able to deliver products that meet customer expectations and maintain the company's reputation for excellence. Companies that can secure low-cost inputs from their suppliers may offer customers more competitive prices while maintaining higher profit margins (Sugianto et al., 2020). The supplier environment can sometimes play a key role in fostering innovation and collaboration in the supply chain (Castaldi et al., 2023). Companies cooperating with suppliers to develop new products, improve production processes, or solve problems will likely be better positioned to create unique and differentiated products that stand out in the market. As consumers become increasingly aware of their products' environmental and social impacts, companies that prioritize Sustainability and social responsibility in their supply chains may be more likely to attract and retain customers (Bubicz et al., 2021).

Environmental uncertainty refers to the level of uncertainty and complexity in the external environment in which a firm operates. In the garment industry in Indonesia, there are both predictable and unpredictable sources of environmental uncertainty that can affect a firm's competitive advantage. Predicted environmental uncertainty refers to changes in the external environment that are expected or can be anticipated with a certain degree of accuracy (Koc et al., 2022). Predicted environmental uncertainty in the garment industry may include changes in consumer preferences, shifts in fashion trends, or fluctuations in the availability and cost of raw materials. Companies anticipating and adapting to these changes may be better positioned to gain a competitive advantage by adjusting product offerings, production processes, and marketing strategies to better align with changing customer needs.

On the other hand, unforeseen environmental uncertainty refers to unpredictable or unexpected changes in the external environment that can catch firms off guard or defenseless (Nabi et al., 2023). Recent unpredictable events in environmental uncertainty in the garment industry are the COVID-19 pandemic, political upheaval, and sudden changes in trade policies. Companies that can respond quickly and effectively to these unexpected changes may be better positioned to gain competitive advantage by minimizing disruptions to the supply chain, developing innovative solutions, and building resilience in the face of uncertainty. The supplier environment requires extra attention from companies because, under unpredictable conditions, companies need complete control over the supplier environment. These conditions will significantly affect the company's supply chain strategy and marketing performance, both positively and negatively.

The findings of this study indicate that the supplier environment with a focus on collaboration will lead to a supply chain strategy with a focus on feasibility to increase the competitive advantage of garment companies in West Java with a focus on the quality of the product. This research can empirically see the relationship between supply chain strategy and supplier environment. So far, no one has conducted empirical research, so this is a novelty in this research. Another novelty related to it is that the unpredictability of the environment is dominant in the supplier environment for competitive advantage.

6. Conclusion

Overall, the garment industry is an integral part of the Indonesian economy and is likely to continue to play an essential role in the country's future growth and development if it is supported by a stable supplier environment, an effective supply chain strategy, and an achievable competitive advantage, taking into account the uncertainty of the environment itself, both predictable and unpredictable. A thorough understanding of the supplier environment is critical to developing an effective supply chain strategy to achieve organizational goals and objectives, namely competitive advantage. Garment companies in West Java and Indonesia can utilize supply chains to achieve competitive advantage by focusing on cost efficiency, product and process quality, and Sustainability. Companies can gain a competitive advantage in a crowded marketplace by building a supply chain strategy that aligns with their overall business strategy and goals. Supplier environment and supply chain strategy can significantly impact the competitive advantage of companies in the garment industry in Indonesia. Companies that manage supplier relationships and capitalize on supplier strengths effectively can be better positioned to execute supply chain strategies, create customer value, improve efficiency, and build a positive brand image.

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