



THE EFFECT OF SUPPLY CHAIN EFFICIENCY ON PRODUCT COMPETITIVE ADVANTAGE AT PT BATRISYIA KOSMETIKA INDONESIA

Vina Lidya¹, Bagas Bananza², Hasyim Muhammad Thoriq^{3*}

^{1,2,3}Faculty of Economics and Business, Universitas Siliwangi, Tasikmalaya, Indonesia

*223402234@unsil.ac.id

Abstract. This study aims to analyze the effect of supply chain efficiency on product competitive advantage at PT Batrisyia Kosmetika Indonesia. The research method used is a quantitative approach with explanatory research design, employing the Partial Least Squares – Structural Equation Modeling (PLS-SEM) technique using smartpls version 4.1 software. The independent variables in this study include three main dimensions of supply chain efficiency: lead time, inventory turnover, and logistics cost, while the dependent variable is product competitive advantage. Data were collected through questionnaires distributed to 30 respondents from the supply chain, production, and logistics divisions. The results show that overall supply chain efficiency has a positive and significant effect on product competitive advantage, with an R^2 value of 0.56. Partially, lead time and logistics cost have a significant effect on competitive advantage, while inventory turnover has a positive but not significant effect. These findings emphasize that speed and cost efficiency in supply chain processes are the key factors in building Batrisyia Kosmetika's product competitiveness. This research provides theoretical contributions to strengthening the Resource-Based View (RBV) and Supply Chain Management theories, as well as practical implications for companies to enhance operational efficiency and product competitiveness through optimized supply chain systems.

Keywords: supply chain efficiency; lead time; inventory turnover; logistics cost; product competitive advantage; PT. batrisyia kosmetika indonesia.

1. Introduction

The cosmetics industry is currently at a point where the competition is hot, both from local and international players. The market is super dynamic – from changing beauty trends, rapidly changing consumer tastes, to increasingly stringent demands for sustainability and transparency. In order to survive, cosmetic companies not only need beautiful and good quality products, but also must be able to respond quickly to market demand, save costs, and maintain the quality and reliability of their services.

The cosmetics industry is rapidly evolving, driven by dynamic consumer preferences, sustainability demands, and intensifying competition. Efficient supply chain operations allow companies to maintain cost effectiveness, product quality, and responsiveness. Supply chain efficiency contributes to lowering lead time, optimizing inventory, and minimizing logistics costs—factors essential for competitive advantage. This study examines how these three dimensions influence PT Batrisyia Kosmetika Indonesia's competitive position.

In the midst of it all, the supply chain is one of the main keys. If the supply chain is efficient, through process digitalization, lean practices, inventory management, and smart logistics, it will generate its own competitive advantage. With a good supply chain, companies can:

1. Shorten procurement and distribution times,
2. Reduce operational and logistics costs,

3. Reduce the risk of stock-out or overstock,
4. More flexible and quick response to changes in market demand,
5. And make a strong product reputation regarding quality and reliability in the eyes of consumers

Many recent studies have shown that the digitization of supply chains and advanced technologies such as IoT, big data, and AI can make operations more efficient and the competitiveness of manufacturing companies or consumer goods stronger. For example, Putra & Arifin (2021) found that digital transformation in supply chain management using big data and IoT makes transparency, responsiveness, and logistics effectiveness in the manufacturing sector better.

In addition, Asrol (2024) in a systematic literature review stated that the adoption of Industry 4.0 in supply chain operations can accelerate the flow of goods and information, plus create advantages in terms of cost and time.

Especially in the cosmetics industry, there is research that highlights the importance of supply chain integration and quality management (TQM) for company performance. Aripin, Jayadi & Yani (2022) investigated the beauty industry in Jakarta and found that TQM plus supply chain integration has a significant positive influence on company performance.

Furthermore, a recent study from Salsabila, Berliana & Yunus (2025) looks at the implementation of sustainable supply chains in Indonesia's beauty & personal care industry, and shows that environmentally and socially friendly supply chain practices can strengthen the company's image and make consumers more interested in buying.

Pressure from outside has made the urgency of supply chain efficiency in the cosmetics industry even higher. For example, global supply chain disruptions, rising logistics costs, volatile consumer demand, and increasingly stringent environmental regulations. A case study in Russia shows that the cosmetics industry faces major challenges in supply chain management due to logistical pressures and import substitution, which directly affects the competitiveness of local products.

For PT Batrisyia Kosmetika Indonesia, which is struggling in the midst of competition for beauty products in Indonesia, the above challenges are also very relevant: accelerating response to the market, maintaining product quality, reducing production and distribution costs, and ensuring products are available on time in the distribution channel. Therefore, companies need to manage their supply chains efficiently in order to gain a competitive advantage in products, namely the ability of products to excel in quality, differentiation, price, brand image, and distribution compared to competitors.

Conceptually, supply chain efficiency is able to improve the company's internal (operational) performance, which later contributes to the competitive advantage of the product. With faster lead times, lower logistics costs, and optimal inventory, companies can use the option of offering products with better quality, more competitive prices, and faster service. These things are especially important in the cosmetics industry, where product trends change rapidly and consumers are sensitive to innovation, availability, and brand experience.

Against this background, this study is important to make a survey on the effect of supply chain efficiency on the competitive advantage of products at PT Batrisyia Kosmetika Indonesia. Both in terms of theory and practice, so that companies can identify areas that need improvement, design a more efficient supply chain strategy, and finally optimize product positions in a super competitive market.

2. Research Methodology

This study uses a quantitative explanatory method to test causal relationships. The population consists of 30 employees from supply chain, production, and logistics divisions, all sampled using saturated sampling.

Research methods are a scientific approach used to collect data with specific purposes and uses (Sugiyono, 2020: 2). This study uses a quantitative method with the type of explanatory research (explanatory research). This method aims to elucidate the causal relationship between independent variables and bound variables through statistical testing of hypotheses. The independent variable in this study is Supply Chain Efficiency, which consists of three main dimensions, namely lead time, inventory turnover, and logistics costs. The bound variable is Product Competitive Advantage.

The research approach used is a survey method, namely by distributing questionnaires to respondents who are employees of the supply chain, warehouse, and production section at PT Batrisyia Kosmetika Indonesia. Through this survey method, the researcher obtained primary data on respondents' perception of the level of supply chain efficiency and its impact on the competitive advantage of the products produced by the company. This method was chosen because it allows researchers to directly measure how much influence between variables is and obtain results that can be generalized to the study population. Data processing was carried out statistically using Partial Least Squares – Structural Equation Modeling (PLS-SEM) through SmartPLS software version 4.1, to test the relationships between variables simultaneously.

Operationalization of variables is used to describe theoretical concepts into measurable indicators. The instrument used was a questionnaire with a five-point Likert scale (1–5), where 1 indicated "strongly disagree" and 5 indicated "strongly agree".

The population of this study is all employees of the supply chain, production, and logistics division of PT Batrisyia Kosmetika Indonesia. Based on the company's internal data, there are around 30 people involved in these activities.

The sampling technique uses saturated sampling (census sampling) because the population is relatively small, so all members of the population are made respondents. The number of respondents who successfully filled out the questionnaire was 30 people, which were considered representative for analysis.

The type of data used is primary data, obtained directly through filling out a questionnaire by respondents. Meanwhile, secondary data is obtained through documentation, internal company reports, and related literature such as scientific Data were collected using a structured Likert-scale questionnaire and analyzed with PLS-SEM (SmartPLS 4.1). The methodology includes:

1. Measurement Model Evaluation: convergent validity, discriminant validity, and reliability.
2. Structural Model Evaluation: R-Square, F-Square, Q-Square, and path coefficients.
Variables:
 - a. Lead Time (X1)
 - b. Inventory Turnover (X2)
 - c. Logistics Costs (X3)
 - d. Product Competitive Advantage (Y)The stages of analysis consist of:
 1. Evaluation of the Outer Model, including:
 - a. Convergent validity test (outer loading and AVE values)

- b. Discriminant validity test (Fornell-Larcker Criterion and Cross Loading)
- c. Construct reliability test (Cronbach's Alpha and Composite Reliability)
- 2. Inner Model Evaluation, including:
 - a. R-Square test to see the strength of the model
 - b. F-Square and Q-Square Test
 - c. Path Coefficient *test* to test the influence between variables
 - d. Significance test through *bootstrapping*

This approach was chosen because it is able to analyze complex models with a limited number of samples, and can estimate the direct relationship between latent variables without having to strictly meet normality assumptions.

3. Research Result and Discussion

3.1 Research Result

The respondents in this study were 30 people who were employees in the supply chain, production, and logistics division of PT Batrisyia Kosmetika Indonesia. Respondents' data was obtained through an online questionnaire distributed through Google Form.

Table 1. Respondents Characteristics

Criterion	Classification	Sum	Percentage
Gender	Man	12	40%
	Woman	18	60%
Age	< 25 years old	5	17%
	25–35 years old	20	67%
	> 35 years old	5	16%
Tenure	< 2 years	6	20%
	2–5 years	17	57%
	> 5 years	7	23%
Division of Work	Production	15	50%
	Logistics & Warehouse	10	33%
	Purchase & Distribution	5	17%

Most of the respondents were 25–35 years old with a working period of 2–5 years, indicating that the majority of employees are of productive age and are quite experienced in the company's supply chain processes.

The convergent validity test is seen from the outer loading and Average Variance Extracted (AVE) values. The indicator is declared valid if it has an outer loading value of ≥ 0.70 and $AVE \geq 0.50$.

Table 2. Validity Test

Variabel	Indicator	Outer Loading	AVE	Information
Lead Time (X1)	LT1	0.82	0.61	Valid
	LT2	0.79		Valid
	LT3	0.74		Valid

Variabel	Indicator	Outer Loading	AVE	Information
Inventory Turnover (X2)	IT1	0.83	0.58	Valid
	IT2	0.76		Valid
	IT3	0.72		Valid
Logistics Costs (X3)	BL1	0.81	0.55	Valid
	BL2	0.77		Valid
	BL3	0.69		Marginal
Competitive Advantage (Y)	KK1	0.85	0.63	Valid
	KK2	0.83		Valid
	KK3	0.79		Valid

All indicators have an outer loading value above 0.70 (except for BL3 slightly below but still acceptable) and an AVE value above 0.50. Thus, the convergent validity is met.

The validity of the discriminator was tested using the Fornell-Larcker criteria. A construct is considered valid if the square root value of the AVE of the construct is higher than its correlation with other constructs.

Table 3. Fornell-Larcker Test

Variabel	X1	X2	X3	And
Lead Time (X1)	0.78			
Inventory Turnover (X2)	0.62	0.76		
Logistics Costs (X3)	0.59	0.57	0.74	
Competitive Advantage (Y)	0.67	0.54	0.61	0.80

The results show that the root of AVE (bold diagonal value) is higher than the correlation between other variables, so that the discriminant validity is met.

Construct is declared reliable if it has Cronbach's Alpha value of ≥ 0.70 and Composite Reliability ≥ 0.70 .

Table 4. Reliability Test

Variabel	Cronbach's Alpha	Composite Reliability	Information
Lead Time	0.78	0.86	Reliabel
Inventory Turnover	0.74	0.84	Reliabel
Logistics Costs	0.71	0.82	Reliabel
Competitive Advantage	0.84	0.89	Reliabel

All Cronbach's Alpha and Composite Reliability values are above 0.7, so all variables meet the reliability criteria.

The R^2 value indicates how much variation of endogenous variables can be explained by exogenous variables.

Table 5. Coefficients of Determination

Variable Endogenous	R-Square	Category
Product Competitive Advantage	0.56	Moderate

Outer model results confirm validity and reliability of all constructs. R^2 for competitive advantage is 0.56, categorized as moderate. Path analysis shows:

- a. Lead Time → Competitive Advantage (significant)
- b. Inventory Turnover → Competitive Advantage (insignificant)
- c. Logistics Costs → Competitive Advantage (significant)
- d. Combined Efficiency → Competitive Advantage (significant)

This means that 56% of the variation in product competitive advantage can be explained by supply chain efficiency (lead time, inventory turnover, and logistics costs), while the remaining 44% is influenced by other factors outside the research model.

The relationships between variables were tested using *the bootstrapping* method. The relationship is considered significant if the t-value > 1.96 and the p-value < 0.05.

Table 6. Hypothesis Testing Results

Relationship	Coefficients	t-statistic	p-value	Information
Lead Time → Competitive Advantage (H1a)	0.38	2.41	0.019	Significant
Inventory Turnover → Competitive Advantage (H1b)	0.27	1.82	0.072	Insignificant
Logistics Costs → Competitive Advantage (H1c)	0.22	2.05	0.046	Significant
Supply Chain Efficiency (combined) → Competitive Advantage (H1)	0.61	3.58	0.001	Significant

3.2 Discussion

1. Lead Time → Product Competitive Advantage (Significant)
Lead time significantly enhances product competitiveness by improving responsiveness and distribution accuracy. Logistics costs significantly influence pricing strategy and cost leadership. Inventory turnover, though positive, is insignificant due to mismatches in forecasting and production cycles.
2. Inventory Turnover → Product Competitive Advantage (Insignificant)
Despite the direction of positive influence, inventory management has not been optimal due to demand fluctuations and unstable production cycles. This condition causes inventory turnover to not have a significant impact on product excellence.
3. Logistics Costs → Product Competitive Advantage (Significant)
The efficiency of transportation and distribution costs is able to reduce selling prices and increase the company's profit margin. These results are in line with *the theory of Supply Chain Management* (Heizer & Render, 2022) which states that logistics efficiency contributes directly to competitive cost advantage.

4. Overall Supply Chain Efficiency → Product Competitive Advantage (Significant)
Simultaneously, supply chain efficiency has a positive and significant effect on product competitive advantage, with the contribution of lead time and logistics costs as dominant factors.

The results support RBV theory, showing that supply chain capabilities contribute to sustainable competitive advantage. They also align with previous research emphasizing efficiency as a core strategic asset in the cosmetics sector.

- a. The short lead time increases the company's flexibility in dealing with changing market demands, so that products can be available on time.
- b. The insignificant inventory turnover shows that the production and stock planning system still needs to be adjusted to the actual demand cycle.
- c. Efficient logistics costs are proven to increase total cost efficiency and strengthen the price position of products in the market.

Overall, these results are consistent with previous research (Fitriani et al., 2023; Suryana & Nugraha, 2022) which found that supply chain efficiency has a positive effect on the competitiveness of companies in the manufacturing and cosmetics industries.

4. Conclusion

Based on the results of the research that has been conducted on *the Effect of Supply Chain Efficiency on Product Competitive Advantage at PT Batrisyia Kosmetika Indonesia*, as well as the results of data processing using SmartPLS version 4.1 on 30 respondents, several conclusions can be drawn as follows:

1. Supply chain efficiency significantly improves product competitive advantage at PT Batrisyia Kosmetika Indonesia. Lead time and logistics cost are key drivers, while inventory turnover needs optimization. Enhancing operational efficiency is crucial for sustaining competitiveness in fast-moving cosmetics markets.
2. Lead time has a positive and significant effect on the competitive advantage of the product. This means that the faster the process of procuring raw materials, production, and distribution, the higher the consumer perception of the timeliness and quality of Batrisyia Cosmetics product services.
3. Inventory turnover has a positive but not significant effect on the competitive advantage of the product. This condition shows that the company's inventory turnover still needs to be optimized, especially in the adjustment between raw material stocks and fluctuations in product demand in the market.
4. Logistics costs have a positive and significant effect on the competitive advantage of the product. Efficiency in transportation and distribution management has been proven to reduce operational costs, increase profit margins, and strengthen the price competitiveness of the company's cosmetic products.

Overall, these findings indicate that operational efficiencies along the supply chain especially in terms of time and cost — are strategic factors in building a sustainable competitive advantage for PT Batrisyia Kosmetika Indonesia.

5. Recommendations

Based on the results of the research that has been conducted, there are several academic suggestions that can be used as a reference for researchers and academics who are interested in developing similar studies. Academically, this research is expected to contribute to the development of the theory of *Supply Chain Management* and *Resource-Based View (RBV)*, especially in explaining how supply chain efficiency can affect the

competitive advantage of products in manufacturing companies, especially in the cosmetics industry.

Further research is suggested to expand the conceptual model by adding mediating variables such as *operational performance* or *product innovation*, so as to provide a more comprehensive picture of the mechanisms of relationships between variables. Thus, the results of the study shed light not only on the direct influence, but also on the indirect relationship between factors in the supply chain system. In addition, it is recommended to use a mixed-method approach, which is a combination of quantitative and qualitative methods. This approach can help deepen understanding of the organizational context and non-technical factors that affect supply chain efficiency, such as work culture, internal communication, and managerial support.

The next researcher can also extend the research object to other companies in the cosmetics sector or manufacturing industry that have a similar supply chain system, so that the research results are more representative and can be compared across contexts. A larger number of respondents will also increase the reliability and validity of empirical findings. In addition, the use of other analysis methods such as Structural Equation Modeling (SEM-AMOS) or multiple regression analysis can be an alternative to test the relationship between variables, so that the results of the study can be validated and compared with the *Partial Least Squares (PLS)* method used in this study.

From a practical perspective, the results of this study provide several recommendations that can be used as a reference for the management of PT Batrisyia Kosmetika Indonesia in improving supply chain efficiency and product competitiveness in the national cosmetics market.

First, companies need to focus on Improve lead time through digital integration and better departmental coordination. This can be done by strengthening coordination between purchasing, production, and distribution departments, as well as implementing a digital-based supply chain information system. The implementation of the system will help accelerate the flow of information and raw materials, so that the production time and delivery of products to consumers can be shortened.

Second, although the results of the study show that inventory turnover has a positive but not significant influence on the competitive advantage of the product, management needs to evaluate the inventory control system. The *Just In Time (JIT) principle Optimize inventory turnover using JIT and accurate forecasting*. The integration of sales, production, and logistics data is also important to prevent excess or under-inventory that can hinder operational efficiency.

Third, in terms reduce logistics costs by optimizing distribution routes and adopting data-driven logistics systems, companies need to optimize distribution channels and negotiate with transportation partners so that shipping costs can be reduced without reducing the speed and quality of service. The implementation of a data-driven logistics tracking system can help identify points of inefficiency in the product delivery and storage process.

In addition to the efficiency aspect, Strengthen supply chain capabilities through employee training and technology adoption. Good supply chain efficiency must be accompanied by the company's ability to create products that are unique, high-value, and in accordance with consumer preferences.

Finally, Future research can include mediators such as operational performance or innovation, and involve larger samples. Therefore, PT Batrisyia Kosmetika Indonesia needs to hold regular training related to logistics management, stock control, and the use

of digital technology in the supply chain system. Competent human resources will be able to carry out operational processes efficiently and be responsive to changes in market demand.

References

- Aripin, R., Jayadi, A., & Yani, F. (2022). TQM and supply chain integration on firm performance in the cosmetic industry. *Journal of Management and Business Studies*, 14(2), 101–115.
- Asrol, R. (2024). Digital transformation and Industry 4.0 in supply chain management: A systematic literature review. *Operations and Industrial Management Journal*, 6(1), 23–38.
- Barney, J. (2023). Resource-based view of the firm: Foundations and implications. *Strategic Management Journal*, 44(3), 525–540.
- Carter, L. (2024). Redefining supply chain strategy in the cosmetics industry: Enhancing speed and sustainability. *International Journal of Operations & Supply Chain Management*, 18(1), 77–95.
- Dalal, A. (2024). Artificial intelligence in supply chain forecasting: Impacts on efficiency and cost reduction. *Journal of Industrial Engineering and Innovation*, 9(2), 64–79.
- Fitriani, D., Rahmawati, E., & Nugraha, R. (2023). Efisiensi rantai pasok dan daya saing perusahaan manufaktur di Indonesia. *Jurnal Ekonomi dan Manajemen Terapan*, 12(4), 204–218.
- Heizer, J., Render, B., & Munson, C. (2023). *Operations management: Sustainability and supply chain management* (14th ed.). Pearson Education.
- Li, J., Zhang, Y., & Liu, X. (2024). Optimizing supply chain management processes for competitive advantage. *Asian Journal of Supply Chain Research*, 5(2), 45–59.
- Porter, M. E. (1985). *Competitive advantage: Creating and sustaining superior performance*. Free Press.
- Putra, I. M., & Arifin, Z. (2021). Digital supply chain efficiency in manufacturing industries: The role of big data and IoT. *Journal of Industrial Economics and Management*, 8(3), 150–165.
- Salsabila, N., Berliana, D., & Yunus, H. (2025). Sustainable supply chain practices in the beauty and personal care industry in Indonesia. *Journal of Sustainable Business and Management*, 7(1), 32–48.
- Sugiyono. (2020). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.
- Suryana, E., & Nugraha, D. (2022). Efisiensi logistik dan daya saing industri kosmetika di Indonesia. *Jurnal Manajemen Operasional dan Kewirausahaan*, 10(1), 54–67.
- Sutia, N. (2022). Integrating supply chain management with marketing strategies to enhance customer satisfaction. *International Journal of Business Strategy and Innovation*, 5(4), 89–102.
- Wang, L. (2025). Building competitive advantage through product differentiation and innovation in FMCG industry. *Journal of Strategic Marketing Studies*, 11(2), 117–132.