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The Influence of Logistic Performance Index Variable On The Competitive Advantage of Basic Non-Iron Metal Companies In Eastern Indonesia

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Abstract: Getting the right items to the right place at the right time under the appropriate conditions is the goal of logistics, which will benefit the business. Businesses took a while to understand how crucial logistics were to gaining a competitive edge over rivals. The research was conducted in nickel processing companies in the eastern part of Indonesia, specifically in Sulawesi, involving 2 (two) companies in the Konawe region, Southeast Sulawesi, and 1 (one) company in the North Morowali region, Central Sulawesi which have obtained bonded zone facilities from Customs. The research involves 100 respondents, consisting of employees and managers responsible for the supply chain and directly involved in logistic activities. The type of research is quantitative with a survey approach. Data is collected through instruments in the form of statement sheets with a Likert scale model that has been tested. Data analysis was carried out using multiple regression using SmartPLS. The results of the analysis show: (1) Customs and Excise have a significant positive effect on competitive advantage; (2) Infrastructure has a significant positive effect on competitive advantage; (3) International shipping has a significant positive effect on competitive advantage; (4) Service Quality has a significant positive effect on competitive advantage; (5) Search Tracking has a significant positive effect on competitive advantage; (6) Timeliness has a significant positive effect on competitive advantage. Several recommendations and policy implications were also presented.

Keyword: Logistics, Competitive Advantage.

INTRODUCTION

As a country rich in natural resources, Indonesia, which is a developing country, of course continues to develop its natural wealth to be processed and processed so that it can produce benefits that can be used for the welfare of society and can increase the country's foreign exchange. The government continues to strive to provide community welfare by opening downstream investment taps so that now many processing factories or smelters have

been established in Indonesia. To support investment, of course logistics activities have an important role, in this case such as planning processes, controlling cost efficiency, procurement processes, and other things that are dynamic, such as movement activities and static activities, such as storage. In the national scope, these logistics activities aim to ensure commodity availability and increase industrial competitiveness.

Getting the right goods to the right place at the right time in the right conditions is the goal of profitable logistics. It took time for the business world to understand how important logistics is to gain a competitive advantage over competitors. Every internal logistics process must be controlled well to achieve high competitiveness (Harimurti, 2018).

According to (Aniyati and Indayani, 2023), competitive advantage is the result of implementing a strategy that utilizes various resources owned by the company, unique skills and assets are seen as a source of competitive advantage, by having a competitive advantage a business will be able to survive in measuring its success, existing business competitiveness supports business performance including the marketing performance of a business. Competitive advantage basically grows from the values or benefits created by the company for its buyers. Customers generally prefer to buy products that have more value than expected.

Studies (Tukamuhabwa et al 2021), (Syahrir, 2023), (Putranto and Nursyamsiah, 2023), (Baqleh and Alateeq, 2023), (Michael, 2023), (Silitonga et al, 2022), and (Sugiono et al, 2023) indicates that intense competitive pressure has forced companies to go beyond their environment to achieve competitive advantage. A feasible action for companies to take is to implement supply chain integration. Supply chain policy has a positive effect on logistics integration, logistics capability has a positive effect on logistics integration, supply chain policy has a positive effect on competitive advantage.

According to Harimurti, 2018, supply chain management is the management of a network of organizations from upstream to downstream which includes relationships between two or more companies and the flow of materials, information and resources. Meanwhile, logistics is the process of planning, implementing and controlling procedures for transporting and storing goods efficiently and effectively. Every company wants to know how its supply chain logistics operations are performing and whether its objectives are being achieved. Therefore, it is important to assess the performance of supply chain logistics and implement it effectively.

According to (Civelek et al, 2015), the Logistics Performance Index (LPI) is the most important indicator for understanding and comparing the logistics performance of a country. Compared with domestic sources, LPI is more reliable because in some countries it is difficult for researchers to find data on market size, number of existing companies, employment, and income in the logistics sector. LPI is an international index calculated through empirical research conducted based on the practical experience of logistics professionals.

Based on data released from (World Bank, 2023) Indonesia's logistics performance is not as good as neighboring countries Singapore, Malaysia and Thailand. In 2023, Indonesia's Logistics Performance Index (LPI) will experience a significant decline. Indonesia is ranked 63rd out of 139 countries, down 17 places compared to 46th position in 2018. Indonesia's LPI score is 3.0. Compared to statistics in 2018, when Indonesia's LPI score was 3.15, this score also decreased. Singapore ranks highest with an LPI score of 4.3 among Southeast Asian countries. Malaysia, which is ranked 31st globally, is ranked lower, with an LPI score of 3.6. Indonesia is even still below Thailand with an LPI score of 3.5 which is ranked 37th in the world. The Philippines and Vietnam are ranked 47th and 50th respectively with the same LPI value of 3.3.

Table 1. Logistic Performance Index Data for ASEAN Countries in 2023

Country name	Global Ranking	LPI Score
Singapore	1	4.3
Malaysia	31	3.6
Thailand	37	3.5
Philippines	47	3.3
Vietnamese	50	3.3
Indonesia	63	3.0

Source: World Bank 2023

According to (Tukamuhabwa et al, 2021), supply chain management practices and logistics integration are positively and significantly related to competitive advantage. (Emir and Santoso, 2023) concluded that Supply Chain Management has a direct and significant positive influence on Competitive Advantage . Research results (Puspitasari and Purwanti, 2021) show that the logistics performance index (LPI) has an insignificant impact on global competitiveness. (Putranto and Nursyamsiah, 2023) found a positive influence of supply chain resilience on company performance and competitive advantage. Research (Wahyuni and Sugiarto, 2023) shows that competitive advantage plays a significant role as a mediating variable between supply chain management practices and company performance. These studies show a significant positive relationship between logistics performance (LPI) and the competitive advantage of companies and countries, except (Puspitasari and Purwanti, 2021) which found the opposite result. In other words, if a country's LPI (Logistic Performance Index) value is low then its competitiveness is also low, this is the phenomenon that Indonesia is currently experiencing. Therefore, of course it is a joint task between the government and industrial business players in Indonesia to be able to move the logistics sector in an even better direction.

METHOD

Types of research This is quantitative with survey approach. Quantitative research according to (Sugiyono, 2019), is a research method based on the philosophy of positivism, as a scientific or scientific method because it meets scientific principles in a concrete or empirical way, objectively, measurably, rationally and systematically (Susanto et al., 2024). Research data collection methods field (Field Research), carried out with method stage review direct to the field becomes object For get primary data. Primary data in general obtained through techniques observation (observation direct), interview , spread instrument research , and documentation . Not all technique used in research This . Collecting primary data in research This done with spread instrument study related variable study . Deployment instrument study done to 100 respondents purposive sampling. Data collection tools used is instrument that contains questions related variables studied . Instrument designed with answer closed consists of 5 alternatives answer Likert scale . According to (Sugiyono , 2019) a Likert scale is used For measure attitudes , opinions , and perceptions somebody or group of people about phonomena social.

RESULTS AND DISCUSSION

Data description is a description of the data used in a study. The tabulation of data from the answers of research respondents totaling 100 people can be seen in Appendix 3 with the following statistical description:

Table 2. Statistical Description of Data

	Mean	Min	Max	Standard Deviation
X11	3	4	3.54	,501
X12	3	4	3.62	,488

X13	3	4	3.69	,465
X21	3	4	3.76	.429
X22	3	5	3.83	.403
X23	3	5	3.89	.373
X24	3	5	3.95	.359
X31	3	5	4.00	.348
X32	3	5	4.05	.359
X41	3	5	4.11	.373
X42	3	5	4.17	.403
X51	4	5	4.24	.429
X52	4	5	4.31	.465
X61	4	5	4.38	.488
X62	4	5	4.46	.501
Y1	3	5	3.63	.525
Y2	3	5	4.12	.518
Y3	3	5	4.37	,525
Y4	3	5	3.88	,518

Table 2 shows that the mean (mean) of respondents' answers to research instrument items ranges from 3.54 to 4.46, which means agree, in other words, the questions asked are appropriate and can represent respondents' perceptions of the supply chain processes they experience every day.

Hypothesis Testing

The output of the analysis using SmartPLS can be seen in Appendix 3 with details of the results as follows:

1. Research Model Diagram

A summary of the results of the analysis of research model parameters (Inner and Outer Model) as a whole can be seen in the following Research Model Diagram:

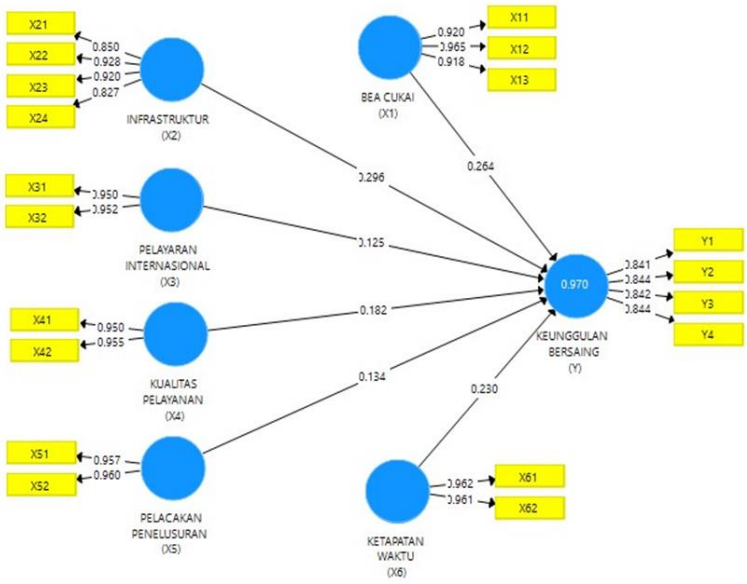

Figure 1. Research Model

In this research, two variables have been determined, namely the independent variable or independent variable (X), which in this case is logistics performance (Logistic Performance Index) and the dependent variable or dependent variable (Y), which in this case is competitive advantage. Based on the picture above, it can be briefly explained that

there is an influence relationship between variables, both independent (free) and dependent (bound) variables.

2. (Logistics Performance Index) variable on Competitive Advantage is as follows:

Table 3. Effect of LPI Variables on Competitive Advantage

LPI variable	Coefficient	P-Values	R square
Customs Duty (X1)	0.264	0,000	0.970
Infrastructure (X2)	0.296	0,000	
Cruise International (X3)	0.125	0,000	
Quality Service (X4)	0.182	0,000	
Tracking Search (X5)	0.134	0.002	
Timeliness (X6)	0.230	0,000	

Table 3 shows that:

a. The multiple regression equation is as follows: Y = 0.264 X1 + 0.296 X2 + 0.125 X3 + 0.182

   It means:

   1) Assuming that X2, X3,) of 1 unit will cause a decrease in Competitive Advantage (Y) of 0.264 units.
   2) Assuming that X1, X3, will cause a decrease in Competitive Advantage (Y) of 0.296 units.
   3) Assuming that X1, X2, 1 unit will cause a decrease in Competitive Advantage (Y) of 0.125 units.
   4) Assuming that X1, X2, X3, 1 unit will cause a decrease in Competitive Advantage (Y) of 0.182 units.
   5) Assuming that X1, X2, X3, 1 unit will cause a decrease in Competitive Advantage (Y) of 0.134 units.
   6) Assuming that X1, X2, 1 unit will cause a decrease in Competitive Advantage (Y) of 0.230 units.

b. Customs Excise (X1) has a significant positive effect on Competitive Advantage (Y); Thus, hypothesis H1 which states that Customs Excise (X1) influences competitive advantage (Y) is proven.
c. Infrastructure (X2) has a significant positive effect on Competitive Advantage (Y); Thus, hypothesis H2 which states that infrastructure (X2) influences competitive advantage (Y) is proven.
d. International Shipping (X3) has a significant positive effect on Competitive Advantage (Y); Thus, hypothesis H3 which states that International Shipping (X3) influences competitive advantage (Y) is proven.
e. Service Quality (X4) has a significant positive effect on Competitive Advantage (Y); Thus, hypothesis H4 which states that Service Quality (X4) influences Competitive Advantage (Y) is proven.
f. Search Tracking (X5) has a significant positive effect on Competitive Advantage (Y); Thus, hypothesis H5 which states that Search Tracking (X5) influences competitive advantage (Y) is proven.
g. Timeliness (X6) has a significant positive effect on Competitive Advantage (Y); Thus, hypothesis H6 which states that timeliness (X6) influences competitive advantage (Y) is proven.
h. The coefficient of determination (R squared) of the research model is 0.970, this shows that the independent variables are Customs and Excise (X1), Infrastructure (X2), International Shipping (X3), Service Quality (X4), Tracking (X5), and Accuracy Time (X6) can explain the dependent variable Competitive Advantage (Y) by 97% while the

remaining 3% is explained by variables other than the six research independent variables.

3. Model Suitability (Model Fit)
   a. Outer Model
      1) Convergent validity outer loading value of each variable can be seen in the following table.

Table 4. Outer Loading

	X1	X2	X3	X4	X5	X6	Y
X11	0.920						
X12	0.965						
X13	0.918						
X21		0.850					
X22		0.928					
X23		0.920					
X24		0.827					
X31			0.950				
X32			0.952				
X41				0.950			
X42				0.955			
X51					0.957		
X52					0.960		
X61						0.962	
X62						0.961	
Y1							0.841
Y2							0.844
Y3							0.842
Y4							0.844

a) The outer loading value of the Customs and Excise variable (X1) ranges from 0.918 to 0.965 which is greater than 0.5 - 0.6 so it is said to be fit .
b) The outer loading value of the Infrastructure variable (X2) ranges from 0.850 to 0.928 which is greater than 0.5 - 0.6 so it is said to be suitable (fit).
c) The outer loading value of the International Shipping variable (X3) ranges from 0.950 to 0.952 which is greater than 0.5 - 0.6 so it is said to be fit .
d) The outer loading value of the Service Quality variable (X4) ranges from 0.950 to 0.955 which is greater than 0.5 - 0.6 so it is said to be fit .
e) The outer loading value of the Tracking and Tracing variable (X5) ranges from 0.957 to 0.960 which is greater than 0.5 - 0.6 so it is said to be fit .
f) The outer loading value of the Timeliness variable (X6) ranges from 0.961 to 0.962 which is greater than 0.5 - 0.6 so it is said to be fit .
g) The outer loading value of the Competitive Advantage variable (Y) ranges from 0.841 to 0.844 which is greater than 0.5 - 0.6 so it is said to be fit.

      2) Discriminant validity

Table 5.Construct Reliability and Validity

	Composite Reliability	Average Variance Extracted (AVE)
CUSTOMS_(X1)	0.954	0.874
INFRASTRUCTURE_(X2)	0.934	0.779
ACCURACY_TIME_(X6)	0.961	0.924
COMPETITIVE_ADVANTAGES_(Y)	0.907	0.710
QUALITY_SERVICE_(X4)	0.951	0.907
TRACKING_SEARCH_(X5)	0.958	0.919
INTERNATIONAL_SHIPPING_(X3)	0.950	0.904

Table 5 shows that the variables Customs Excise (X1), Infrastructure (X2), International Shipping (X3), Service Quality (X4), Tracking and Tracing (X5), Timeliness (X6), and Competitive Advantage (Y) have discriminant validity the good one Because have mark average variance extracted (AVE) respectively amounted to 0.874, 0.779, 0.904, 0.907, 0.919, 0.924, and 0.710 which is bigger from 0.50.

3) Composite reliability

Table 4 also shows that the variables Customs Excise (X1), Infrastructure (X2), International Shipping (X3), Service Quality (X4), Tracking and Tracing (X5), Timeliness (X6), and Competitive Advantage (Y) have a composite good reliability because everyone has it mark composite reliability of 0.954, 0.934, 0.950, 0.951, 0.958, 0.961, and 0.907 which is bigger from 0.70.

b. Inner Model

The suitability of the inner model is measured by a formula $Q^2 = 1 – (1 – R1^2) (1 – R2^2) ... (1- Rp^2)$ where Table 4shows that $R1^2$ = R- square Superiority compete (Y) = 0.970 so $Q^2 = 1 – (1 – (0.970)^2) = 1 – (1 – 0.9409) = 1 – 0.0591 = 0.9409$ which is close to 1 so said suitability inner model is Good.

The Effect of Customs on Competitive Advantage

The results of the analysis show that Customs and Excise has a significant positive effect on Competitive Advantage. This finding is in line with research (Al-Haddad et al, 2023), as well as (Chen and Ma, 2015) which states that customs procedures are the backbone of international trade and supply chains but become obstacles for import and export businesses if the process is not managed properly. Good. This process may change over time as the world economy changes. Based on the observations in this research, improvements still need to be made in the bureaucracy in the document processing process at Customs. In fact, there are still many delays in the document processing process because there are several import activity processes that are still related to rules or regulations with other related agencies. For example, it is necessary to have an Iron and Steel IP issued by the Ministry of Trade or Pertek (Technical Regulations) for certain goods issued by the Ministry of Industry, where processing time is required with requirements that must be fulfilled by the company as an importer. This can cause the processing process in customs or Custom Clearances to drag on due to the interests of each agency. There is a need for Border Control Management related to the processing of exports and imports at customs from the government so that the customs management process can run well and there is no overlapping of interests between agencies. Apart from that, in the custom clearance process or submitting documents, problems often occur in sending documents via the CEISA system, this is related to the maintenance system at customs and also the network. In this case, there needs to be good supervision and cooperation between related agencies. Research conducted by (Tukamuhabwa et al, 2021), (Syahrir, 2023), (Putranto and Nursyamsiah, 2023), (Baqleh and Alateeq, 2023), (Michael, 2023), (Silitonga et al, 2022), and (Sugiono, 2023) found that supply chain management practices and logistics integration are positively and significantly related to competitive advantage.

The Influence of Infrastructure on Competitive Advantage

The results of the analysis show that Infrastructure has a significant positive effect on Competitive Advantage. These results are in line with research (Galkin et al, 2019) which reveals that problem adjustments to the supply process goods in a way Keep going continuously to something retail network requires solution problem infrastructure chain logistics . Logistics chain infrastructure determines logistics costs for the material flow

development process . On research in thesis this and based on results on- site observations place study ongoing discovery that For infrastructure Alone Still Not yet said good and optimal because location For place activity operationalization Still in stage development with expand as well as repair room mobilization means transport land, like repair roads and expansion land in the port jetty area. Meanwhile, research (Tukamuhabwa et al, 2021), (Syahrir, 2023), (Putranto and Nursyamsiah, 2023), (Baqleh and Alateeq, 2023), (Michael, 2023), (Silitonga et al, 2022), and (Sugiono, 2023) who found that supply chain management practices and logistics integration were positively and significantly related to competitive advantage.

The Influence of International Shipping on Competitive Advantage

The results of the analysis show that International Shipping has a significant positive effect on Competitive Advantage. These results are in line with research by Chia et al (2021) which states that globalization has increased competition and affected company operations throughout the world. Both international trade and the economy depend heavily on the development of transportation logistics. From the results of observations in the research, it was found that logistics costs are a main area in international business, and enable the movement and flow of economic transactions. International shipping is mainly operated by large logistics service providers with network coverage throughout the world, and the ability to handle and coordinate the delivery of goods over long distances. Price factors or freight rates and the availability of carrier vessels from shipping owners or shipping companies sometimes become obstacles in the process of sending goods. The availability of information, in this case the government through the NLE (National Logistic Ecosystem) program , has become the right solution, but not all shipping companies are willing to provide information, especially regarding prices and availability of ships in this system. There needs to be intensive outreach from the government and related agencies regarding this program. Increasing the competitive advantage of the international logistics industry is very important for a country.

The Influence of Service Quality on Competitive Advantage

The results of the analysis show that Service Quality has a significant positive effect on Competitive Advantage. These results are in line with research by Pratiwi et al (2023), Nurdin and Nasito (2023), and Anugrah et al (2020) which stated that Service quality is a company's way of working that seeks to continuously improve the quality of processes, products and services produced to satisfy customers in the hope that these customers will be loyal to the company and prefer the company it manages compared to other competitors.

In line with the results of previous research, in this research it was found that the quality of service provided by the company to consumers is running well by always providing clear information to consumers regarding product availability, competitive prices and a delivery process that always prioritizes OTIF (On Time In Fact) .

The Effect of Tracking and Tracing on Competitive Advantage

The analysis results show that Search Tracking has a significant positive effect on Competitive Advantage. These results are in line with research by Pal and Yasar (2023) which reveals that in the traditional sense, supply chain (SC) is a series of processes and specific business entities (e.g. suppliers, manufacturers, distributors, retailers and end customers) that are interconnected to manage the flow of goods and services. products and services to meet needs. orders and customer satisfaction. Planning, sourcing, manufacturing, shipping, returning, and enabling reuse after the end of the product life cycle are key SC processes. From observations in this research, divisions related to the supply chain use

various approaches to integrate suppliers, manufacturers, distributors, and after-sales services to carry out business activities and use the right strategies to deliver products and services to customers in the right quantities to customers, appropriate location, and at the right time to handle the required level of service at optimal cost. Therefore information technology (IT) and information and communication technology play an important role. Furthermore, research by Tukamuhabwa et al (2021), Syahrir (2023), Putranto and Nursyamsiah (2023), Baqleh and Alateeq (2023), Michael (2023), Silitonga et al (2022), and Sugiono et al (2023) found that chain management practices supply and logistics integration are positively and significantly related to competitive advantage.

The Effect of Timeliness on Competitive Advantage

The results of the analysis show that Timeliness has a significant positive effect on Competitive Advantage. These results are in line with research by Marziali et al (2022) which revealed that although supply chain plans take anticipated conditions into account, events in the real world can have a different impact on the behavior of various agents (internal and/or external) than expected, thereby affecting the efficiency of the plan. This impact must be minimized to maintain efficiency at the desired level. Based on the results of observations in this research, operationalization is continuously controlled using information about system status to take corrective action to avoid undesirable results, so that timeliness is achieved and logistics performance is improved. This can be seen by good communication between lines in the field, both in terms of logistics and other related parties in the field such as stevedooring, loading and unloading companies, shipping agents. Meanwhile, research by Tukamuhabwa et al (2021), Syahrir (2023), Putranto and Nursyamsiah (2023), Baqleh and Alateeq (2023), Michael (2023), Silitonga et al (2022), and Sugiono et al (2023) found that chain management practices supply and logistics integration are positively and significantly related to competitive advantage.

Of the six hypotheses tested, it was proven that all hypotheses were in line with previous research.

CONCLUSION

Referring to the research objectives and results of hypothesis testing, it can be concluded that:

1. There is a significant positive influence of 6 (six) Logistic Performance Index variables consisting of customs, infrastructure, international shipping, service quality, tracking and tracing, timeliness on competitive advantage where the correlation coefficient value for the 6 (six) variables is between 0.125 – 0.296, which means positive because the value of each variable is between 0-1.
2. The coefficient of determination (R squared) of the research model is 0.970, this shows that the independent variables are Customs and Excise (X1), Infrastructure (X2), International Shipping (X3), Service Quality (X4), Tracking (X5), and Accuracy Time (X6) can explain the dependent variable Competitive Advantage (Y) by 97% while the remaining 3% is explained by variables other than the six research independent variables.
3. From the results of the convergent validity test, the value of the outer loading results for each variable in this study is greater than 0.5 - 0.6 so it is said to be fit .
4. Shipping (X3), Service Quality (X4), Tracking and Tracing (X5), Timeliness (X6), and Competitive Advantage (Y) have good discriminant validity Because have mark average variance extracted (AVE) respectively amounted to 0.874, 0.779, 0.904, 0.907, 0.919, 0.924, and 0.710 which is more big from 0.50.
5. The variables Customs Excise (X1), Infrastructure (X2), International Shipping (X3), Service Quality (X4), Tracking and Tracing (X5), Timeliness (X6), and Competitive

Advantage (Y) have good composite reliability because everyone has it mark composite reliability of 0.954, 0.934, 0.950, 0.951, 0.958, 0.961, and 0.907 which is bigger from 0.70.

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