# Analyzing the Competitiveness of Indonesia's Lobster Exports: Comparative and Competitive Advantages Using RCA and ECI Indices

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**Abstract**

*This research aims to analyze the competitiveness (comparative and competitive advantages) of Indonesia's lobster commodity exports. The data used in this research consists of secondary data in the form of panel data obtained from the Ministry of Marine Affairs and Fisheries of Indonesia, the Food and Agriculture Organization (FAO), the United Nations Commodity Trade (UN Comtrade), and the International Trade Center (ITC). Comparative advantage is measured using the Revealed Comparative Advantage (RCA) index, and competitive advantage is measured using the Export Competitiveness Index (ECI). The findings reveal that Indonesia holds a stronger comparative advantage in lobster exports compared to Vietnam, with an average RCA value of 25.46 for Indonesia and 13.08 for Vietnam. Similarly, Indonesia demonstrates higher competitive advantage, as indicated by an average ECI value of 3.57 compared to Vietnam's 3.28. However, Indonesia's ECI values have shown fluctuations in recent years, highlighting periods of declining competitive advantage due to export policies and international market conditions. The findings provide policymakers with insights to develop balanced policies that ensure both environmental sustainability and economic growth. Additionally, it highlights the critical need for ongoing, granular analysis of export dynamics, particularly in the context of the Southeast Asian market.*

**Keywords:** *Comparative Advantage, Competitive Advantage, Lobster Commodity Exports, Revealed Comparative Advantage, Export Competitiveness Index*

## INTRODUCTION

The Ministry of Marine Affairs and Fisheries of the Republic of Indonesia has revealed that Indonesia, as a country with the highest number of islands in the world, boasts 17,504 islands and a vast marine territory covering 5.8 million km². This territory consists of island waters spanning 2.95 million km², territorial seas covering 0.3 million km², and an Exclusive Economic Zone (EEZ) expanding over 2.55 million km². The immense potential of Indonesia's marine biodiversity needs to be effectively optimized, both for conservation purposes and for productive economic utilization. Indonesia's seas hold significant potential, including approximately 8,500 fish species, 555 seaweed species, and 950 coral reef biota species. Several fish species in Indonesian waters have high economic value, such as tuna, shrimp, lobster, coral fish, various ornamental fish, seaweed, and sponges. In terms of total fish resources in the ocean, Indonesia encompasses 37% of all fish species worldwide (Data Statistik dan Informasi Kelautan dan Perikanan, 2021).

One of Indonesia's fisheries commodities with significant potential for development is lobster shrimp (Panulirus sp.). Lobster is a type of crustacean animal that holds substantial economic value both in the local and global markets. All lobster variants are known as a source of animal protein with high market value. Indonesia is one of the main producers and exporters of lobster due to its rich coral reef ecosystems, which

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serve as habitats for various lobster species. In Indonesian waters, six different lobster species have been identified, including pearl lobster (P. ornatus), bamboo lobster (P. versicolor), batik lobster (P. cygnus), sand lobster (P. homarus), rock lobster (P. longipes), and Pakistan lobster (P. polyphagus) (Bayu Priyambodo, 2018a).

Indonesia is one of the countries in Southeast Asia that produces lobsters (Setyanto et al., 2019). From an economic perspective, marine creatures belonging to the decapoda family, such as lobsters, are among the most sought-after seafood, with exports reaching 9 million tons in the global market (Setyanto et al., 2019). Lobster has experienced an approximate 15% increase in demand worldwide. During the period from 2013 to 2016, there was a sustained rise in international market demand for lobsters, as reflected in the increasing annual average of global imports (Beni et al., 2020). The impact of the global market has particularly influenced the increased demand from major export destination countries like China. Data from the Fish Quarantine, Quality Control, and Fisheries Product Safety Agency revealed that in January 2021, the total volume of live lobster exports reached 682,870 individuals, with an average daily export of approximately 42,679 individuals.

Indonesia has a competitive advantage in the fisheries industry, coupled with a comparative advantage and market potential, which includes domestic fish consumption growth and increased exports of fisheries products to international markets. To continue benefiting from global trade, Indonesia needs to maintain its competitive edge. Fisheries products with strong competitiveness are expected to endure and grow, resulting in increased exports that will support local production, fishermen's and fish farmers' income, create job opportunities, and boost the country's foreign exchange earnings (Permana et al., 2019).

To maintain its presence on the international stage, Indonesia needs to focus on enhancing its competitiveness in lobster shrimp exports. This becomes a crucial element, considering that Vietnam, a neighboring country in Southeast Asia, also has a highly significant lobster shrimp export industry. The commercial success and aquaculture development of lobster shrimp in Vietnam have made it the only country in the world to fully succeed in this regard (Utama et al., 2021). Therefore, it is only fitting for the Indonesian government to make improvements in the competitiveness of the lobster shrimp commodity.

Indonesia's marine wealth encompasses approximately 8,500 fish species, 555 seaweed species, and 950 coral reef biota species. Some marine fish species in Indonesia hold significant economic value, such as tuna, shrimp, lobster, coral fish, various ornamental fish, sponges, and seaweed. In fact, the quantity of fish resources in Indonesian waters constitutes 37% of the total fish species worldwide (Data Statistik dan Informasi Kelautan dan Perikanan, 2021).

Empirical research on the comparative and competitive advantages of lobster shrimp commodities has been limited. In this study, the competitive status of lobster shrimp from Vietnam, which serves as a competitor to Indonesia in terms of exports, is also included as a benchmark, considering that Vietnam remains the largest lobster shrimp exporter in Southeast Asia and is Indonesia's closest export competitor since Indonesia is the second-largest lobster shrimp exporter after Vietnam. Therefore, it is essential to understand the extent of Indonesia's lobster shrimp export competitiveness through the research conducted by the author with the title "Analysis of Comparative and Competitive Advantages in the Export of Lobster Shrimp (Panulieus sp.) from Indonesia."

## LITERATURE REVIEW

Comparative Advantage

The theory of comparative advantage, introduced by David Ricardo (1817), suggests that countries should specialize in the production and export of goods in which they have a lower opportunity cost compared to other nations. This specialization allows countries to benefit from trade by focusing on producing goods where they have efficiency advantages. In the context of Indonesian lobster exports, comparative advantage is measured using the Revealed Comparative Advantage (RCA) index. A higher RCA value indicates that Indonesia is more efficient at producing and exporting lobsters compared to other countries, leveraging its rich marine biodiversity and favorable environmental conditions. (Porter, 1999) theory of competitive advantage extends the concept of comparative advantage by focusing on the factors that allow nations to achieve and

sustain higher performance levels in specific industries. Competitive advantage in this study is measured using the Export Competitiveness Index (ECI), which assesses Indonesia's ability to maintain its market share over time through factors such as product quality, cost competitiveness, and innovation in production and marketing strategies. The integration of competitive advantage concepts helps identify the strengths and weaknesses of Indonesia's lobster exports relative to its main competitor, Vietnam.

Lobster Commodity Exports

The study of lobster commodity exports is situated within the broader context of marine resource economics, which examines the sustainable management and economic utilization of marine biodiversity (Bose & Galvan, 2005). The focus on lobster, a high-value marine resource, underscores its economic significance both locally and globally. Indonesia's vast marine territory, home to various high-economic-value species, provides a unique advantage in the global seafood market (Le & Chen, 2020). This section of the framework explores how Indonesia can optimize its lobster resources for export, taking into account factors such as market demand, supply chain logistics, and international trade dynamics.

Policy and Regulatory Framework

The role of government policies and regulatory frameworks is critical in shaping the competitiveness of export commodities. This framework acknowledges the impact of policy measures on enhancing production capabilities, ensuring quality standards, and promoting sustainable practices. In Indonesia, initiatives by the Ministry of Marine Affairs and Fisheries to develop superior regions and support sustainable aquaculture practices are vital for boosting the competitiveness of lobster exports (Data Statistik dan Informasi Kelautan dan Perikanan, 2021). This section examines how these policies contribute to the comparative and competitive advantages of Indonesian lobster, emphasizing the need for continuous policy support to sustain growth and competitiveness in the international market.

Comparative advantage of Indonesian lobsters

Comparative advantage refers to a country's ability to produce a good or service at a lower opportunity cost than another country. This concept is crucial in international trade theory and helps explain why countries engage in trade even when one country is more efficient in producing all goods (Wei-Bin Zhang, 2008). In the context of Indonesian lobster exports, comparative advantage is measured using the Revealed Comparative Advantage (RCA) index. A higher RCA value indicates that Indonesia is more efficient at producing and exporting lobsters compared to other countries, leveraging its rich marine biodiversity and favorable environmental conditions (Oktavilia et al., 2019). The focus on lobster, a high-value marine resource, underscores its economic significance both locally and globally. Indonesia's vast marine territory, home to various high-economic-value species, provides a unique advantage in the global seafood market. This section of the framework explores how Indonesia can optimize its lobster resources for export, taking into account factors such as market demand, supply chain logistics, and international trade dynamics. The role of government policies and regulatory frameworks is critical in shaping the competitiveness of export commodities (Aslan et al., 2015). This framework acknowledges the impact of policy measures on enhancing production capabilities, ensuring quality standards, and promoting sustainable practices. In Indonesia, initiatives by the Ministry of Marine Affairs and Fisheries to develop superior regions and support sustainable aquaculture practices are vital for boosting the competitiveness of lobster exports (Data Statistik dan Informasi Kelautan dan Perikanan, 2021). This section examines how these policies contribute to the comparative and competitive advantages of Indonesian lobster, emphasizing the need for continuous policy support to sustain growth and competitiveness in the international market.

## RESEARCH METHOD

### Scope of the Research

The scope and limitations of this research exclusively cover the focus on lobster exports from Indonesia and Vietnam. The commodity that will be the object of this study is the lobster commodity with the 6-digit HS code, which is 030631 (Rock lobster and other sea sea crawfish "Panulirus spp.,Panulirus spp., and Jasus

spp.,",weather in shell or not, live, fresh or chilled).

## Types of Research

This research utilizes secondary data as its methodology with a quantitative approach. A quantitative approach is a method of acquiring understanding that relies on numerical data to gather information about the topic under investigation (Robert Plonsey, 2007). The quantitative data includes the export and import values of Indonesian lobster shrimp, the total export value of Indonesia, the export value of lobster shrimp worldwide, and the total export value of the world to major destination countries.

## Types and Sources of Data

The data used in this research consists of secondary data in the form of panel data. Panel data comprises time series data or data collected at specific time points along with cross-sectional data. The time series data used includes the last five years from 2017 to 2021. Meanwhile, the cross-sectional data includes five destination countries for exports: Singapore, Malaysia, Thailand, China, and Korea. Secondary data was obtained from the Ministry of Marine Affairs and Fisheries of Indonesia, the Food and Agriculture Organization (FAO), the United Nations Commodity Trade (UN Comtrade), and the International Trade Center (ITC).

## Data Analysis

The data analysis methods used in this research involve descriptive and quantitative approaches. The descriptive approach is used to illustrate the export situations of Indonesia and Vietnam's lobsters. Meanwhile, the quantitative approach, which involves applying numerical data, is used to analyze comparative advantage and competitive competitiveness (Barattieri, 2014). In this research, an approach to analyze the competitiveness of lobster commodities is used:

*Revealed Comparative Advantage* (RCA)

This method allows the evaluation of a country's export performance for a specific product by comparing the export value of that product to the country's total export value, and then comparing it to the export value of that product to the total world export value (French, 2017). The formula for the Revealed Comparative Advantage (RCA) Index used is as follows

$$RCA = XijX{*}j/XiwX{*}w$$

Where:

Xi= Lobster export value by country X

Xj= Total export value of country X

Xiw= Lobster export value worldwide

Xw= Total world export value

If the RCA value is > 1, it indicates that the products have significant comparative advantage or strong competitiveness. If the RCA value is < 1, it suggests that the products do not have comparative advantage or have low competitiveness (Laursen, 2015).

*Analisis Export Competitiveness Index* (ECI)

Export Competitiveness Index (ECI) is a value that depicts the proportion of a country's exports in the global market concerning a specific commodity in a given period (t) when compared to a previous period (t-1). The formula used to calculate ECI, as per (Oktavilia et al., 2019), is as follows:

$$ ECI \quad \frac{(X\text{ki} / \text{Xw})\, t}{\left(\frac{Xki}{Xw}\right) t \,-\, 1} $$

Where:

Xki = Exports of commodity in country i at time I

Xw = Exports of commodity in country i at time t-1

$t$ = World exports of the commodity at time t

$t$ - 1= World exports of the commodity at time t-1

If the ECI value for the lobster commodity in the researched countries, both Indonesia and Vietnam, exceeds one (>1), it can be interpreted that this lobster commodity is experiencing growth in competitiveness trends and is capable of creating market opportunities. On the other hand, if the ECI value is less than one (<1), it indicates that the lobster commodity is facing a decline in competitiveness trends, meaning its competitiveness is weakening, and it may be losing market share (Oktavilia et al., 2019).

## RESULTS

Indonesia's marine wealth encompasses approximately 8,500 fish species, 555 seaweed species, and 950 coral reef biota species. Some marine fish species in Indonesia hold significant economic value, such as tuna, shrimp, lobster, coral fish, various ornamental fish, sponges, and seaweed. In fact, the quantity of fish resources in Indonesian waters constitutes 37% of the total fish species worldwide (Data Statistik dan Informasi Kelautan dan Perikanan, 2021). The commercial success and aquaculture development of lobster shrimp in Vietnam have made it the only country in the world to fully succeed in this regard (Utama et al., 2021). Therefore, it is only fitting for the Indonesian government to make improvements in the competitiveness of the lobster shrimp commodity. Market demand for Indonesian spiny lobster in Vietnam is strong and growing, far exceeding supply. There appears to be a great opportunity to increase lobster production in larger quantities with little impact on prices (Jones et al., 2019). The future of lobster farming appears to be very positive, especially for developing countries in the Asian region, particularly Vietnam.The following chart shows the value of lobster exports from Indonesia to Vietnam in the international market from 2017 to 2020.
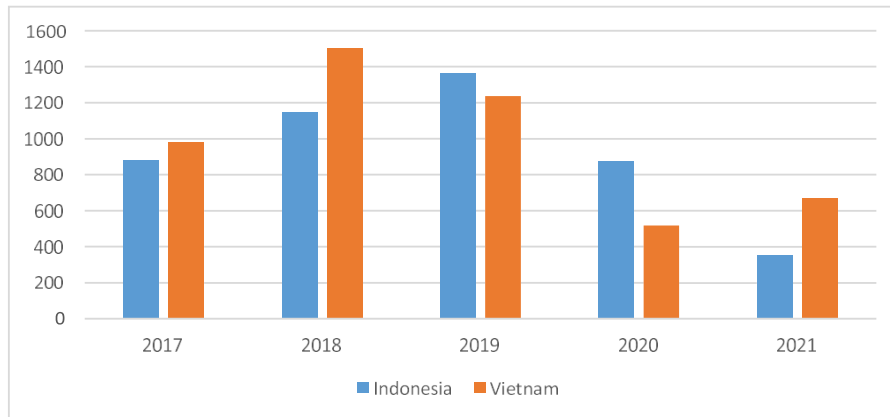


Source: The export value of lobsters from Indonesia and Vietnam in the International Market in the years 2017 to 2020 (Rahiel, 2023)

From the figure, it can be observed that there is a difference in lobster shrimp exports between Indonesia and Vietnam during the period from 2017 to 2021. In 2017, the export value of lobster shrimp from Indonesia to the international market amounted to $879,561 USD. In 2018, Indonesia's lobster shrimp exports reached $1,148,453 USD, while in 2019, it amounted to $1,361,960 USD. However, in 2020, the export value of Indonesian lobster shrimp decreased to $876,144 USD, and in 2021, it further dropped to $354,040 USD. On

the other hand, for Vietnam, in 2017, the export value of lobster shrimp to the international market was $978,267 USD. In 2018, Vietnam's lobster shrimp exports significantly increased to $1,505,592 USD. In 2019, Vietnam's lobster shrimp exports amounted to $1,236,742 USD. However, in 2020, the export value of Vietnamese lobster shrimp declined to $518,060 USD, and in 2021, it increased to $669,264 USD. To gain a comprehensive understanding of the export market situation for Indonesian lobsters, the following information includes the export values of Indonesian lobsters and other Southeast Asian countries to the worldwide market during the period from 2017 to 2021.

**Table 1. Export Values of Lobsters from Southeast Asian Countries (in million US dollars) in the years 2017-2021.**

| Countries | Export Value (million US$) | | | | |
|---|---|---|---|---|---|
| | **2017** | **2018** | **2019** | **2020** | **2021** |
| **Indonesia** | 22,56 | 29,92 | 33,34 | 76,11 | 28,62 |
| **Vietnam** | 6,60 | 7,09 | 25,02 | 149,43 | 39,18 |
| **Malaysia** | 9,41 | 13,16 | 15,60 | 16,61 | 10,61 |
| **Philippines** | 12,44 | 7,24 | 2,35 | 1,13 | 3,39 |
| **Myanmar** | 0,88 | 11,98 | 15,75 | 9,79 | 3,53 |
| **Singapore** | 7,48 | 5,37 | 5,52 | 11,09 | 9,12 |
| **Thailand** | 0,43 | 0,25 | 0,28 | 1,62 | 6,91 |
| **Cambodia** | 0,31 | 0,34 | 0,37 | - | - |

Based on UN Comtrade data for the period 2017-2021 above, it can be seen that Indonesia, Vietnam, and Malaysia are the three main countries in Southeast Asia that export lobsters globally. In 2020, Indonesia held the top position in this list, using HS code 030631 for the export of Panulirus spp. As the largest type at that time, Indonesia generated exports worth 71.44 million US dollars out of a total lobster export value of 76.11 million US dollars. Within these figures, 39.41 million US dollars were lobster seed exports. In the same year, Vietnam recorded exports with a value more than double that of Indonesia, totaling 149.43 million US dollars. This sharp increase is believed to be largely due to the illegal entry of Indonesian lobster seeds in the previous years. The following is a graph of the value of Indonesian lobster exports to destination countries.



Source: Graph of Indonesia's Lobster Export Values to Main Destination Countries 2010-2021 (Kyaw & Jalil, 2022)

The graph above depicts a pyramid-like structure with two peaks, indicating a significant decline in Indonesia's lobster export value after reaching its peak in 2013. Subsequently, the value dropped in the following years and only began to rise again in 2020. The drastic decline between 2013 and 2020 suggests that there was an impact generated by the role of lobster seeds in regulating the fluctuation of Indonesia's total lobster product export graph over the past twelve years, which was also influenced by government policies through Ministerial Regulation of Marine Affairs and Fisheries (Permen KP) Number 56 of 2016 and Permen KP Number 12 of 2020. The policy of banning lobster seed exports has contributed to a drastic decline in lobster harvesting activities, ultimately impacting the livelihoods of fishermen and the economy (Bayu Priyambodo, 2018b). However, if the ban were not implemented, it would be considered counterproductive as it could benefit the

lobster industry in Vietnam, which heavily relies on Indonesian lobster seeds. While in monetary terms, lobster seed prices can reach fantastic values, from an ecological standpoint, the risk of massive exploitation of lobster seeds can have extremely negative consequences on their future survival.

## Export Competitiveness of Lobster

The findings of this research highlight the significant increase in Indonesia's lobster exports, with China emerging as the largest market. This is supported by data from the Fish Quarantine, Quality Control, and Fisheries Product Safety Agency, which recorded a notable rise in live lobster exports, reaching 682,870 individuals in January 2021 alone. The competitive advantage of Indonesia's lobster exports is evidenced by the RCA index value greater than 1, indicating a comparative advantage over other countries, including Vietnam, which remains the largest exporter of lobster shrimp in Southeast Asia. This advantage is due to Indonesia's rich coral reef ecosystems, which provide ideal habitats for various lobster species such as pearl lobster (P. ornatus) and bamboo lobster (P. versicolor), as noted by (Jones et al., 2019)

Several factors influence the competitiveness of Indonesia's lobster exports, including market distribution effects, previous export prices, and the population of importing countries. Studies by (Muzayyin et al., 2019) and (Rahiel, 2023) suggest that the increased demand from major export destinations, particularly China, has significantly contributed to this competitive edge. The global market's impact on export prices and the growing demand for high-value seafood have further bolstered Indonesia's position in the international market. Policy recommendations to enhance this competitiveness include improving market strategies, providing government support, and adopting sustainable fishing practices. These measures can lead to economic benefits such as boosting local production, increasing fishermen's income, creating job opportunities, and enhancing foreign exchange earnings, as highlighted by (Pomeroy et al., 2020) and (Hajad et al., 2023).

**Table 2. RCA (Revealed Comparative Advantage) Values for Indonesian Lobster Commodities HS Type 036031 Daya Saing Komparatif**

| Year | Destination Countries | | | | | |
|------|-----------|---------|----------|-------|-------|----------------------|
|      | Singapura | Malaysia | Thailand | China | Korea | Internasional Market |
| 2017 | 0 | 2,45 | 0,52 | 0,99 | 53,56 | 11,50 |
| 2018 | 9,27 | 8,76 | 1,01 | 0,78 | 29,37 | 9,83 |
| 2019 | 6,78 | 25,75 | 0,41 | 0,94 | 123,7 | 31,39 |
| 2020 | 10,47 | 31,26 | 0,36 | 0,92 | 123,1 | 33,23 |
| 2021 | 3,63 | 88,04 | 0 | 1,32 | 0,02 | 18,60 |

Source: International Trade Center (ITC)

The analysis results indicate that Indonesia's lobster commodity with HS type 030631 (Rock lobster and other sea crawfish "Palinurus spp., Panulirus spp., and Jasus spp.," whether in shell or not, live, fresh, or chilled) has comparative competitiveness in the international market. This is based on the RCA measurement results, which show that Indonesia's RCA value for this commodity is above 1. This indicates that the lobster of HS type 030631 exported by Indonesia has gained appreciation and possesses a high comparative advantage or strong competitiveness.

**Table 3. The RCA (Revealed Comparative Advantage) value for Vietnam's lobster commodity of HS type 030631**

| Year | Destination Countries | | | | | |
|------|-----------|---------|----------|-------|-------|----------------------|
|      | Singapura | Malaysia | Thailand | China | Korea | Internasional Market |
| 2017 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2018 | 0,68 | 1,29 | 1,10 | 0,02 | 20,67 | 23,76 |
| 2019 | 0,89 | 7,10 | 3,63 | 0,77 | 0 | 12,39 |
| 2020 | 1,37 | 20,98 | 2,02 | 3,71 | 0 | 28,08 |
| 2021 | 0 | 0 | 0,04 | 1,76 | 4,13 | 1.18 |

Source: International Trade Center (ITC)

For the average RCA analysis value of lobster shrimp exports, Vietnam has an RCA value above 1, indicating that Vietnam has a comparative advantage in competitiveness. This aligns with research conducted by (Nankervis & Jones, 2022; Rahiel, 2023), which focused on the competitiveness of shrimp exports from Vietnam in the Mekong River Delta region. The analysis method used in their study was the Revealed Comparative Advantage (RCA) Index. The study was conducted in 2010, and its findings concluded that the

export of shrimp commodities from Vietnam in the Mekong River Delta region had a comparative advantage in the international market. Indonesia holds a superior position in comparative advantage compared to Vietnam. Despite Vietnam's average RCA value being above 1, Indonesia has a fairly strong comparative advantage in the international market for lobster exports.

## Competitive Competitiveness

**Table 4. ECI (Export Competitiveness Index) Values of Indonesian Lobster Commodities**

| Year | Destination Countries | | | | | |
|------|-----------|----------|----------|-------|-------|---------------------|
|      | Singapura | Malaysia | Thailand | China | Korea | Internasional Market |
| **2017** | 0    | 0    | 0     | 0    | 0    | 0    |
| **2018** | 2,1  | 2,37 | 0,94  | 1,41 | 1,81 | 7,17 |
| **2019** | 0,63 | 0,82 | 0,47  | 1,39 | 1,08 | 3,52 |
| **2020** | 1,15 | 0,62 | 0,5   | 1,23 | 0,58 | 3,61 |
| **2021** | 0,64 | 1,26 | 0,002 | 1,12 | 0,06 | 3,08 |

Source: International Trade Center (ITC)

Based on the ECI analysis results, it is evident that Indonesia had a competitive advantage with the highest value in 2017. However, looking at the values for the last four years, there has been fluctuation in the ECI values, indicating a decline in Indonesia's level of competitive advantage. The decrease in ECI values in Indonesia is attributed to the decline in lobster commodity exports to five countries: Singapore, Malaysia, China, Thailand, and Korea.

**Table 5. The ECI (Export Competitiveness Index) value for Vietnam's lobster commodity of HS type 030631**

| Year | Destination Countries | | | | | |
|------|-----------|----------|----------|-------|-------|---------------------|
|      | Singapura | Malaysia | Thailand | China | Korea | Internasional Market |
| **2017** | 0    | 0    | 0    | 0     | 0 | 0     |
| **2018** | 0    | 0    | 0    | 0     | 0 | 0     |
| **2019** | 1,13 | 1,52 | 3,95 | 39,82 | 0 | 42,47 |
| **2020** | 1,23 | 1,44 | 0,37 | 6,22  | 0 | 8,89  |
| **2021** | 0    | 0    | 0,06 | 0,21  | 0 | 0,27  |

Source: International Trade Center (ITC)

In the analysis of ECI results, Vietnam had the highest competitive advantage in the international market in 2019. On average, Indonesia's ECI values outperformed Vietnam's during the research period. However, Indonesia's lobster shrimp competitiveness is still relatively low.

## DISCUSSION

The research on the competitiveness of Indonesia's lobster shrimp exports, analyzed through the Revealed Comparative Advantage (RCA) and Export Competitiveness Index (ECI), reveals critical insights into the export dynamics between Indonesia and Vietnam. based on analysis Comparative Advantage (RCA) results show that Indonesia consistently holds a stronger comparative advantage in lobster exports compared to Vietnam. With RCA values for Indonesia averaging above 25, in contrast to Vietnam's 13, this shows a substantial edge in international markets. This finding is consistent with studies such as (Nguyen Tuan Kiet & Sumalde, 2008; Johansen et al., 2019; Khanal & Deb, 2022), which emphasize Vietnam's comparative advantage in shrimp exports, indicating a similar trend in international market competitive landscape.

As for the analysis result Competitive Advantage (ECI) values suggest that both countries possess competitive advantages, with Indonesia demonstrating higher ECI values than Vietnam on average. However, the fluctuations in ECI values for Indonesia in recent years highlight periods of declining competitive advantage, influenced by export policies and international market conditions. This trend is corroborated by studies such as (Belton et al., 2020), which observed similar market behaviors in Global South export sector. The comprehensive analysis of RCA and ECI provides a nuanced understanding of the competitive landscape for Indonesian and Vietnamese lobster exports. The consistency of Indonesia's comparative advantage, despite fluctuating competitive advantage (Jones et al., 2019), highlights the complex interplay between market conditions and export performance. The study aligns with previous research (Anderson et al., 2019; Wang et

al., 2019; Miao et al., 2021), supporting the notion that both intrinsic product qualities and external market factors significantly influence export success.

The study underscores the need for ongoing analysis of export competitiveness using indices like RCA and ECI. Future research could expand on these findings by incorporating more granular data and exploring the impacts of specific government policies on export dynamics. The fluctuating ECI values highlight the need for a deeper investigation into the underlying causes and potential mitigation strategies (Breitenbach et al., 2022). For practitioners in the seafood export industry, the findings suggest a strategic focus on maintaining and enhancing comparative advantages through quality improvements and robust supply chain management. Collaborations with government and academic institutions can aid in addressing challenges such as crop failures and market fluctuations (Kolk & Lenfant, 2015), the study's insights into the economic impacts of export policies have significant implications for the livelihoods of local fishing communities. Ensuring sustainable practices in lobster farming and export can mitigate adverse socio-economic impacts, fostering economic stability and growth. The findings advocate for balanced policies that support both environmental sustainability and economic viability. For practitioners in the seafood export industry, particularly those involved in lobster exports, the findings suggest strategic actions to enhance both comparative and competitive advantages. Continuous enhancement of product quality to meet international standards can reinforce Indonesia's comparative advantage. Investment in better farming techniques and sustainable practices can lead to more consistent and higher-quality outputs.

## CONCLUSION

In conclusion, this study underscores the vital need for ongoing analysis of export competitiveness using indices like RCA and ECI. By identifying the strengths and weaknesses within Indonesia's lobster export sector, stakeholders can develop targeted strategies to enhance both comparative and competitive advantages. The comprehensive analysis of RCA and ECI provides a nuanced understanding of the competitive landscape for Indonesian and Vietnamese lobster exports. The consistency of Indonesia's comparative advantage, despite fluctuating competitive advantage, illustrates the complex interplay between market conditions and export performance. The theoretical foundations laid by this study, coupled with its practical implications, highlight the importance of a tailored approach to export management. Future research and policy development should build on these findings to ensure sustainable and competitive growth in the seafood export industry. Incorporating more granular data in future studies will help capture the micro-dynamics of the export market. Detailed regional analysis within Indonesia can uncover specific strengths and weaknesses that aggregated data might overlook. Investigating the underlying causes of fluctuating ECI values can help identify potential mitigation strategies. Consideration of factors such as global economic conditions, trade agreements, and competitive actions from other exporting countries will be essential.

### Study Limitations and Future Research

The comprehensive analysis of RCA and ECI provides a nuanced understanding of the competitive landscape for Indonesian and Vietnamese lobster exports. The consistency of Indonesia's comparative advantage, despite fluctuations in competitive advantage, underscores the complex interplay between market conditions and export performance. This study is consistent with previous research and supports the notion that both intrinsic product characteristics and external market factors significantly influence export success. The findings underscore the need for ongoing analysis of export competitiveness using indices such as RCA and ECI. Future research should incorporate more granular data to capture the micro-dynamics of the export market and explore the impact of specific government policies on export dynamics. Limitations of the study include its reliance on secondary data, its focus on a specific time period, and the absence of an analysis of other Southeast Asian countries that could provide a broader perspective on competitiveness. The fluctuating ECI scores highlight the need for a deeper investigation into the underlying causes and possible mitigation strategies.

### Conflct of Interest

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# REFERENCES

Adha, W. M., & Mas' ud, A. A. (2024). Digital Marketing Development Strategy of Cocoa Products. Revista de Gestão Social e Ambiental, 18(6), e05305-e05305.

Anderson, J. L., Asche, F., & Garlock, T. (2019). Economics of Aquaculture Policy and Regulation. Annual Review of Resource Economics, 11(1), 101–123. https://doi.org/10.1146/annurev-resource-100518-093750

Aslan, L. O. M., Iba, W., Bolu, L. O. R., Ingram, B. A., Gooley, G. J., & de Silva, S. S. (2015). Mariculture in SE Sulawesi, Indonesia: Culture practices and the socio economic aspects of the major commodities. Ocean & Coastal Management, 116, 44–57. https://doi.org/10.1016/j.ocecoaman.2015.06.028

Barattieri, A. (2014). Comparative advantage, service trade, and global imbalances. Journal of International Economics, 92(1), 1–13. https://doi.org/10.1016/j.jinteco.2013.11.004

Bayu Priyambodo. (2018a). The development of spiny lobster aquaculture in Indonesia through the enhancement of puerulus catch and technology transfer. The University of New South Wales, 7(June), 1–293. https://doi.org/https://doi.org/10.26190/unsworks/20527

Bayu Priyambodo. (2018b). The development of spiny lobster aquaculture in Indonesia through the enhancement of puerulus catch and technology transfer. The University of New South Wales, 7(June), 1–293.

Belton, B., Reardon, T., & Zilberman, D. (2020). Sustainable commoditization of seafood. Nature Sustainability, 3(9), 677–684. https://doi.org/10.1038/s41893-020-0540-7

Beni, Zairion, & Wardiatno, Y. (2020). Biological aspect of double-spined rock lobster (Panulirus penicillatus) in Wonogiri Regency waters, Central Java, Indonesia. IOP Conference Series: Earth and Environmental Science, 420(1), 012006. https://doi.org/10.1088/1755-1315/420/1/012006

Bose, S., & Galvan, A. (2005). Export supply of New Zealand's live rock lobster to Japan: an empirical analysis. Japan and the World Economy, 17(1), 111–123. https://doi.org/10.1016/j.japwor.2003.09.001

Breitenbach, M. C., Chisadza, C., & Clance, M. (2022). The Economic Complexity Index (ECI) and output volatility: High vs. low income countries. The Journal of International Trade & Economic Development, 31(4), 566–580. https://doi.org/10.1080/09638199.2021.1995467

Data Statistik dan Informasi Kelautan dan Perikanan. (2021). Analisis Keberlanjutan Dan Analisis Prosfektif Budidaya Udang. Laporan Tahunan Kementerian Kelautan Dan Perikanan Tahun 2021. https://statistik.kkp.go.id/home.php?m=publikasi&i=214

French, S. (2017). Revealed comparative advantage: What is it good for? Journal of International Economics, 106, 83–103. https://doi.org/10.1016/j.jinteco.2017.02.002

Hajad, V., Ilhamsyah, F., & Aripin, N. (2023). Evaluasi Kebijakan Perdagangan Lobster yang Pro Nelayan di Provinsi Aceh. Journal of Government and Politics (JGOP), 5(1), 32. https://doi.org/10.31764/jgop.v5i1.12521

Johansen, U., Bull-Berg, H., Vik, L. H., Stokka, A. M., Richardsen, R., & Winther, U. (2019). The Norwegian seafood industry – Importance for the national economy. Marine Policy, 110, 103561. https://doi.org/10.1016/j.marpol.2019.103561

Jones, C. M., Le Anh, T., & Priyambodo, B. (2019). Lobster Aquaculture Development in Vietnam and Indonesia BT - Lobsters: Biology, Fisheries and Aquaculture. In E. V Radhakrishnan, B. F. Phillips, & G. Achamveetil (Eds.), Springer, Singapore (pp. 541–570). Springer Singapore. https://doi.org/10.1007/978-981-32-9094-5_12

Khanal, N. B., & Deb, U. (2022). Fish and Fishery Products Trade by India: Trends, Competitiveness, and Comparative Advantage. Asian Journal of Agriculture and Development, 19(2), 51–71. https://doi.org/10.37801/ajad2022.19.2.5

Kolk, A., & Lenfant, F. (2015). Cross-Sector Collaboration, Institutional Gaps, and Fragility: The Role of Social Innovation Partnerships in a Conflict-Affected Region. Journal of Public Policy & Marketing, 34(2), 287–303. https://doi.org/10.1509/jppm.14.157

Kyaw, A. Y., & Jalil, J. (2022). Analysis Of Policy Has Been Established By The Minister On Opening The Export Of Lobster Seed In Indonesia. Maritime Park Journal of Maritime Technology and Society, 99–103. https://doi.org/10.62012/mp.v1i3.21957

Laursen, K. (2015). Revealed comparative advantage and the alternatives as measures of international specialization. Eurasian Business Review, 5(1), 99–115. https://doi.org/10.1007/s40821-015-0017-1

Le, J., & Chen, X. (2020). Overview of Major Fishery Countries in the World BT - Brief Introduction to Fisheries (X. Chen & Y. Zhou (eds.); pp. 97–130). Springer Singapore. https://doi.org/10.1007/978-981-15-3336-5_3

Mas'ud, A. A., & DJ, A. A. (2023). The Role of Human Resource Management in Enhancing the Professionalism of Educators. MANDAR: Management Development and Applied Research Journal, 6(1), 49-56.

Miao, M., Liu, H., & Chen, J. (2021). Factors affecting fluctuations in China's aquatic product exports to Japan, the USA, South Korea, Southeast Asia, and the EU. Aquaculture International, 29(6), 2507–2533. https://doi.org/10.1007/s10499-021-00761-y

Muzayyin, Y., Masyhuri, N. A., Darwanto, D. H., & Junaidi, E. (2019). Competitiveness and protection policy: the case of Indonesian lobster exports to the Asian markets. International Journal of Trade and Global Markets, 12(3/4), 260. https://doi.org/10.1504/IJTGM.2019.101562

Nankervis, L., & Jones, C. (2022). Recent advances and future directions in practical diet formulation and adoption in tropical Palinurid lobster aquaculture. Reviews in Aquaculture, 14(4), 1830–1842. https://doi.org/10.1111/raq.12675

Nguyen Tuan Kiet, N. T. K., & Sumalde, Z. M. (2008). Comparative and competitive advantage of the shrimp industry in Mekong River Delta, Vietnam. Asian Journal of Agriculture and Development, 5(1 PP-Los Banos), 57–79.

Oktavilia, S., Firmansyah, Sugiyanto, F., & Rachman, M. A. (2019). Competitiveness of Indonesian fishery commodities. IOP Conference Series: Earth and Environmental Science, 246, 012006. https://doi.org/10.1088/1755-1315/246/1/012006

Permana, G. N., Slamet, B., Permana, B. A., Dewi, A. K., & Mahardika, G. N. (2019). POPULATION GENETIC STRUCTURE OF SPINY LOBSTERS, Panulirus homarus AND Panulirus ornatus, IN THE INDIAN OCEAN, CORAL TRIANGLE, AND SOUTH CHINA SEA. Indonesian Aquaculture Journal, 14(1), 7. https://doi.org/10.15578/iaj.14.1.2019.7-14

Pomeroy, R., Arango, C., Lomboy, C. G., & Box, S. (2020). Financial inclusion to build economic resilience in small-scale fisheries. Marine Policy, 118, 103982. https://doi.org/10.1016/j.marpol.2020.103982

Porter, M. E. (1999). Michael Porter on Competition. The Antitrust Bulletin, 44(4), 841–880. https://doi.org/10.1177/0003603X9904400405

Rahiel, R. (2023). Indonesian Lobster Seed Trade Export to Vietnam in 2014-2019. Proceedings of the 1st Pedagogika International Conference on Educational Innovation, PICEI 2022, 15 September 2022, Gorontalo, Indonesia. https://doi.org/10.4108/eai.15-9-2022.2336190

Robert Plonsey, R. C. B. (2007). Bioelectricity A Quantitative Approach. Springer US. https://doi.org/10.1007/978-0-387-48865-3

Setyanto, A., Soemarno, Wiadnya, D., & Nugroho, C. (2019). Biodiversity of Lobster (Panulirus) from Eastern Indian Ocean of Indonesia Waters. IOP Conference Series: Materials Science and Engineering, 546(2), 022024. https://doi.org/10.1088/1757-899X/546/2/022024

Utama, M. I. C., Yustiati, A., Andriani, Y., & Rostika, R. (2021). Lobster Cultivation in Indonesia and Vietnam: A Review. Asian Journal of Fisheries and Aquatic Research, 12–20. https://doi.org/10.9734/ajfar/2021/v13i130255

Wang, P., Tran, N., Wilson, N. L. W., Chan, C. Y., & Dao, D. (2019). An Analysis of Seafood Trade Duration: The Case of ASEAN. Marine Resource Economics, 34(1), 59–76. https://doi.org/10.1086/700599

Wei-Bin Zhang. (2008). International Trade Theory. Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-78265-0